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 1-800-233-5019. Send electronic mail requests to cjd5818 okway.okstate.edu. OSU information is also available via the Internet (www.okstate.edu). Publications concerning a number of topics are also available upon request.

The summer and fall class schedule books are usually available in February, and the spring class schedule book in October, and may be obtained from the student academic services offices, or through the mail from the Office of the Registrar.

An application packet and viewbook, with information for prospective students on admission, residence halls, financial aid, scholarship, and the Honors Program, is available from the Office of High School and College Relations.

The OSU Catalog may be obtained by new students, free of charge from their student academic services offices, at the beginning of their first semester at OSU. Other persons may purchase the Catalog through the Student Union Bookstore or through the mail. Reference copies are also available in many administrative offices and libraries, and Oklahoma high schools, junior and community colleges.

To purchase a copy of the OSU Catalog through the mail, send a check or money order for $5.25 for Library Rate or $7.00 for First Class, payable to Oklahoma State University, to Central Mailing Service, Attn: Catalog Requests, Publishing and Printing East, Oklahoma State University, Stillwater, OK 74078.

In addition to these publications, many of OSU's colleges, schools and departments have printed material concerning their programs. Contact the individual departments for specific information.

Oklahoma State University, in compliance with Titles VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, sex, age, religion, handicap, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to, admission, employment, financial aid and educational services.

Photographs are courtesy of Centennial Histories, Special Collections, The Daily O'Collegian, and various OSU offices and colleges.

This publication, issued by Oklahoma State University as authorized by the Office of the Registrar, was printed by Phillips Brothers Printers at a cost of $26,332.00 for 19,000 copies.
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ANTHONY BROWN, Ph.D., Coordinator of Programs, University Center At Tulsa
(charge offices are located in Tulsa)
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LARRY KRUSE, M.S., Director of High School and College Relations
ROBERT L. SPURRIER, JR., Ph.D., Director of the University and Arts and Sciences Honors Programs
ROBERT E. GRAALMAN, Ph.D., Director of University Scholarships
ROBIN H. LACY, Ed.D., Registrar
## Contents

6 Calendar

10 Entering the University

15 Enrollment and Records

18 Costs

21 Financial Aid

23 Student Services

26 Special Programs, Services and Facilities

33 Student Life

35 OSU-Oklahoma City

36 OSU-Okmulgee

43 University Academic Regulations

51 Degree Programs Offered

52 College of Agricultural Sciences and Natural Resources

63 College of Arts and Sciences

89 College of Business Administration

97 College of Education

110 College of Engineering, Architecture and Technology

129 College of Human Environmental Sciences

135 College of Osteopathic Medicine

137 College of Veterinary Medicine

140 Faculty

147 The Graduate College

172 Graduate Faculty

192 Course Listings

304 Index
## University Calendar

### First Semester 1995-96, Fall
- **August 14-18**: Monday-Friday Enrollment
- **August 18**: Friday, last day to cancel enrollment
- **August 21**: Monday, class work begins
- **August 25**: Friday, last day to enroll
- **August 25**: Friday, last day for 80% refund on withdrawal
- **August 28**: Monday, last day to add
- **September 1**: Friday, last day to file a diploma application
- **September 1**: Friday, last day to drop a course with no grade and no fees charged for course
- **September 1**: Friday, last day for 50% refund on withdrawal
- **September 4**: Monday, university holiday
- **September 11**: Monday, last day for 25% refund on withdrawal
- **September 29**: Friday, last day to drop or withdraw with an automatic "W"
- **October 2**: Monday, last day to file a diploma application
- **October 2**: Monday, last day to drop or withdraw with an automatic "W"
- **October 3**: Tuesday, fall break
- **October 4**: Wednesday, "Monday" classes will meet
- **October 13**: Friday, progress reports for freshmen due from faculty
- **October 27**: Friday, last day to drop with an assigned "W" or "F"
- **November 6**: Monday, university holiday begins
- **November 23**: Thursday, university holiday begins
- **November 27**: Monday, class work resumes
- **December 1**: Friday, last day to withdraw with an assigned "W" or "F"
- **December 4-8**: Monday-Friday, pre-finals week
- **December 11-15**: Monday-Friday, final examinations
- **December 15**: Friday, class work ends
- **December 19**: Tuesday, grades due from faculty
- **December 22-January 1**: Friday through Monday, university holidays

### Second Semester 1995-96, Spring
- **January 2-5**: Tuesday-Friday, enrollment
- **January 5**: Friday, last day to cancel enrollment
- **January 8**: Monday, class work begins
- **January 12**: Friday, last day to enroll
- **January 12**: Friday, last day for 80% refund on withdrawal
- **January 15**: Monday, last day to add
- **January 19**: Friday, last day to drop a course with no grade and no fees charged for course
- **January 19**: Friday, last day to file a diploma application
- **January 19**: Friday, last day to drop or withdraw with an automatic "W"
- **February 16**: Friday, last day to drop or withdraw with an automatic "W"
- **March 1**: Friday, progress reports for freshmen due from faculty
- **March 2**: Saturday, spring break begins
- **March 11**: Monday, class work resumes
- **March 18**: Monday, enrollment for fall begins
- **March 22**: Friday, last day to drop with an assigned "W" or "F"
- **April 19**: Friday, last day to withdraw with an assigned "W" or "F"
- **April 22-26**: Monday-Friday, pre-finals week
- **April 29-May 3**: Monday-Friday, final examinations
- **May 3**: Friday, class work ends
- **May 4**: Saturday, commencement
- **May 7**: Tuesday, grades due from faculty

### Winter Intersession
- **December 4-8**: Monday-Friday, enrollment
- **December 18**: Monday, intersession begins
- **December 29**: Friday, intersession ends

### Summer 1996, Regular 8-Week Summer Session
- **May 27**: Monday, university holiday
- **May 30**: Thursday, university holiday
- **May 31**: Friday, last day to file a diploma application
- **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 drop a course with no grade and no fees charged for course
- **June 7**: Friday, last day to withdraw with an automatic "W"
- **July 4**: Thursday, university holiday
- **July 5**: Friday, last day to drop with an assigned "W" or "F"
- **July 12**: Friday, last day to withdraw with an assigned "W" or "F"
- **July 26**: Friday, class work ends
- **July 30**: Tuesday, grades due from faculty
- **July 4-15**: Monday-Friday, final examinations
- **July 16**: Tuesday, grades due from faculty
- **July 19**: Monday, university holiday
- **July 22**: Thursday, university holiday begins
- **July 23**: Friday, last day to drop with an assigned "W" or "F"
- **July 27**: Monday, class work resumes
- **August 1**: Friday, last day to drop or withdraw with an automatic "W"
- **August 4**: Monday, last day to enroll
- **August 8**: Friday, last day for 80% refund on withdrawal
- **August 11**: Monday, last day to add
- **August 14**: Thursday, last day for 50% refund on withdrawal
- **August 17**: Monday, last day to drop or withdraw with an assigned "W" or "F"
- **August 21**: Friday, last day to withdraw with an assigned "W" or "F"
- **August 24**: Monday, class work ends
- **August 27**: Friday, grades due from faculty

### Short summer sessions are usually held for three weeks in May, for four weeks in June, and for four weeks in July. Proportionate dates for fee refunds, dropping, and withdrawing apply to block and short courses.

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6 The University
**First Semester 1996-97, Fall**

- August 12-16, Monday-Friday
  Enrollment
- August 16, Friday
  Last day to cancel enrollment
- August 19, Monday
  Class work begins
- August 23, Friday
  Last day to enroll
- August 23, Friday
  Last day for 80% refund on withdrawal
- August 26, Monday
  Last day to add
- August 30, Friday
  Last day to file a diploma application
- August 30, Friday
  Last day to drop a course with no grade and no fees charged for course
- August 30, Friday
  Last day for 50% refund on withdrawal
- September 2, Monday
  University holiday
- September 9, Monday
  Last day for 25% refund on withdrawal
- September 27, Friday
  Last day to drop or withdraw with an automatic "W"
- October 7, 8, Monday, Tuesday
  Fall break (tentative)
- October 9, Wednesday
  "Monday" classes will meet (tentative)
- October 11, Friday
  Progress reports for freshmen due from faculty
- October 25, Friday
  Last day to drop with an assigned "W" or "F"
- November 4, Monday
  Enrollment for Spring begins
- November 27, Wednesday
  Last day to withdraw with an assigned "W" or "F"
- November 28, Thursday
  University holiday begins
- December 2, Monday
  Class work resumes
- December 2-6, Monday-Friday
  Pre-finals week
- December 9-13, Monday-Friday
  Final examinations
- December 13, Friday
  Class work ends
- December 17, Tuesday
  Grades due from faculty
- December 24-January 1, Tuesday through Wednesday
  University holidays

**Winter Intersession**

- December 2-6, Monday-Friday
  Enrollment
- December 16, Monday
  Intersession begins
- December 27, Friday
  Intersession ends

**Second Semester 1996-97, 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 an automatic "W"
- March 7, Friday
  Progress reports for freshmen due from faculty
- March 8, Saturday
  Spring break begins
- March 17, Monday
  Class work resumes
- March 24, Monday
  Enrollment for Fall begins
- March 28, Friday
  Last day to drop with an assigned "W" or "F"
- April 25, Friday
  Last day to withdraw with an assigned "W" or "F"
- April 28-May 2, Monday-Friday
  Pre-finals week
- May 5-9, Monday-Friday
  Final examinations
- May 9, Friday
  Class work ends
- May 10, Saturday
  Commencement
- May 13, Tuesday
  Grades due from faculty

**Summer 1997**

**Regular 8-Week Summer Session**

- May 26, Monday
  University holiday
- June 5, 6, Thursday, Friday
  Enrollment
- June 6, Friday
  Last day to cancel enrollment
- June 9, Monday
  Class work begins
- June 10, Tuesday
  Last day for 80% refund on withdrawal
- June 11, Wednesday
  Last day to enroll
- June 11, Wednesday
  Last day to add
- June 12, Thursday
  Last day for 50% refund on withdrawal
- June 13, Friday
  Last day to file a diploma application
- June 13, Friday
  Last day to drop a course with no grade and no fees charged for course
- June 13, Friday
  Last day for 25% refund on withdrawal
- June 27, Friday
  Last day to drop or withdraw with an automatic "W"
- July 4, Friday
  University holiday
- July 11, Friday
  Last day to drop with an assigned "W" or "F"
- July 18, Friday
  Last day to withdraw with an assigned "W" or "F"
- August 1, Friday
  Class work ends
- August 5, Tuesday
  Grades due from faculty
- Short summer sessions are usually held for three weeks in May, for four weeks in June, and for four weeks in July.
- Proportionate dates for fee refunds, dropping, and withdrawing apply to block and short courses.
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 1948 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. Once the student has identified his or her major department, he or she becomes a very important individual to the faculty and advisers of that department. Because the average number of students majoring in any one department is less than 150, the student can count on personal attention in a friendly environment.

The largeness of the University has many distinct advantages. OSU's 1.5 million volume library, its modern research laboratories and equipment, excellent physical education, recreation and student union facilities, nationally-recognized residence halls programs, outstanding cultural events, and 36 nationally-affiliated fraternities and sororities, all provide a stimulating educational and social environment.

The Mission

Oklahoma State University is a modern comprehensive land grant university that serves the state, national and international communities by providing its students with exceptional academic experiences, by conducting scholarly research and other creative activities that advance fundamental knowledge, and by disseminating knowledge to the people of Oklahoma and throughout the world.

Athletics Program Mission

Oklahoma State University is committed to providing regionally and nationally competitive athletics programs as an integral part of the overall educational mission of the University. Programs sponsored are in compliance with the highest recognized standards of the institution and the athletic governing bodies. Intercollegiate athletics operates in harmony with the University's stated mission and is committed to the intellectual, cultural, physical and social development of the student-athletes as individuals. Opportunities for student-athletes are provided without discrimination.

Student Profile

OSU has a diverse student body. Students come not only from Oklahoma, but from across the nation and world. Of OSU's 25,200 students, approximately 17,850 are on the Stillwater campus, 2,200 at Okmulgee and 4,150 at Oklahoma City, as well as 725 students at the University Center at Tulsa and 325 students at the College of Osteopathic Medicine in Tulsa. Eighty-six percent of students at the College of Osteopathic Medicine in Tulsa. Eighty-six percent of the undergraduate enrollment is from Oklahoma; eight percent from other states; and six percent from more than 90 foreign countries. Of the undergraduate population, 54 percent are men and 46 percent are women. Minorities make up 12 percent of the undergraduate student body. The graduation rate of full-time, degree-seeking undergraduate students is 46 percent.

The graduate student enrollment totals 4,009. Of these students, approximately 600 enroll through the University Center at Tulsa. Sixty-seven percent are from Oklahoma; 12 percent from other states; and 21 percent from foreign countries. Of the graduate population, 56 percent are men and 44 percent are women. Minorities make up eight percent of the graduate student body.

Facilities

The OSU campus is one of exceptional beauty, with modified Georgian style architecture in many of the buildings. The main campus encompasses 840 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.

Recently three state-of-the-art facilities were constructed which nicely complement the University's campus design and overall mission. The Noble Research Center is a major interdisciplinary research facility that enhances collaboration of basic research among various departments throughout the University. The Center for International Trade Development focuses on identifying and developing overseas markets for Oklahoma products and services. The first-in-the-nation Wellness Center is dedicated to developing contemporary health maintenance programs.

In November 1992 the people of Oklahoma approved a higher education bond issue that will fund at least fifteen new projects for OSU. Three of the top projects include the Advanced Technology Research Center Facility for the College of Engineering; a new location for the College of Education in a stately Georgian-style facility in the heart of campus; and the Food Processing Research Center, that is intended to advance Oklahoma's position as a world leader in value-added food processing technology.
The Lake Carl Blackwell area, located eight miles west of Stillwater, is also owned by OSU. The area includes approximately 21,655 acres, including the 3,000-acre Lake Carl Blackwell which provides the water supply for OSU. 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**

Not only has Oklahoma State University enjoyed accreditation by the North Central Association of Colleges and Secondary Schools, but programs within the colleges are also accredited.

In the College of Agricultural Sciences and Natural Resources, the forestry program is accredited by the Society of American Foresters. The landscape architecture program (Bachelor of Landscape Architecture) is accredited by the American Society of Landscape Architects. In addition, the College's teacher education program in agricultural education is accredited by the Oklahoma State Department of Education, and the Oklahoma State Department of Vocational-Technical Education.

In the College of Arts and Sciences, the medical technology program is accredited by the National Accrediting Association of Clinical Laboratory Science; the chemistry program is accredited by the American Chemical Society; the School of Journalism and Broadcasting as well as the programs in advertising, broadcast journalism, news editorial, and public relations are accredited by the Accrediting Council on Education in Journalism and Mass Communications; and the music department is accredited by the National Association of Schools of Music. The program of clinical psychology is accredited by the American Psychological Association; the program in speech and language pathology is accredited by the American Speech-Language-Hearing Association.

All programs in the College of Business Administration are fully accredited by the American Assembly of Collegiate Schools of Business, a nationally-recognized accrediting body for programs in business and management. The School of Accounting enjoys separate accreditation by this body.

In the College of Education, the aviation programs are accredited by the Federal Aviation Administration, the only nationally-recognized accrediting body for programs in aviation. OSU was the first university in Oklahoma with a program that received this designation. The counseling psychology program is provisionally accredited by the American Psychological Association. Programs in the School of Health, Physical Education and Leisure are accredited by the National Recreation and Park Association as well as the American Association for Leisure and Recreation. All teacher education programs are accredited by the Oklahoma State Board of Education and the North Central Association of Colleges and Secondary Schools. Business education, technical education, as well as trade and industrial education teacher education programs are also accredited by the Oklahoma State Department of Vocational-Technical Education.

In the College of Engineering, Architecture and Technology, engineering and technology programs are reviewed for accreditation by separate commissions of the Accreditation Board for Engineering and Technology as measured against general and program-specific criteria. Consult the program descriptions in the Catalog for details of current accreditation status. The National Architecture Accrediting Board has accredited the bachelor's program in architecture.

Professional programs in the College of Human Environmental Sciences are recognized by prestigious accreditations and approvals. All programs culminating in a B.S. in Human Environmental Sciences are accredited by the Council for Accreditation of the American Association of Family and Consumer Sciences. The Foundation of Interior Design Education Research has accredited the undergraduate interior design program. The National Academy of Early Childhood Programs has accredited the Child Development Laboratory program that serves as a model teaching laboratory for students in early childhood education. The American Association of Marriage and Family Therapists (AAMFT) has accredited the master's program in marriage and family therapy. The American Dietetic Association has approved the Preprofessional Practice Program (AP4) and the Didactic Program in Dietetics (DPD). The School of Hotel and Restaurant Administration is accredited by the Accreditation Commission for Programs in Hospitality Administration (ACPHA). The Early Childhood Education Program is accredited as a part of the OSU Teacher Education unit.

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.

Programs at OSU's branch campuses have also received accreditation from national agencies. The College of Osteopathic Medicine-OSU is accredited by the Bureau of Professional Education of the American Osteopathic Association. The nursing program at OSU-Oklahoma City is accredited by the National League for Nursing and approved by the Oklahoma Board of Nurse Registration and Nursing Education.

Refer to the appropriate college sections in the Catalog for further 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 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.

Americans with Disabilities Act (ADA) Program

Ken Chance, Director

Considerable progress has been made to enhance ADA access to OSU programs, services, facilities and grounds. Students with disabilities are encouraged to help with such efforts through the ADA Advisory Council for Individuals with Disabilities. In addition, students may exercise their "rights" if dissatisfied with student services or accommodations. OSU is committed to improving the full and nondiscriminatory participation in all aspects of campus life for individuals with disabilities. For more information, contact the Office of ADA Compliance, 315 Student Union.

Entering the University--Admissions

Gordon L. Reese, Associate Director
Darlene Wilson, Administrative Associate
Paulette Cundiff, Coordinator, Admissions Operations
Linda Peale, Coordinator, Admissions Programs
Karen Power, Coordinator, International Admissions
Karen R. Mott, Coordinator, Transfer Credit Evaluations

Application Procedure

When to Apply

It is advisable to apply for admission several months in advance of the first semester in which enrollment is desired. Applications for admission 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

OSU requires a non-refundable application fee of $15 for all applicants. The fee must accompany a student's Application for Admission.

Freshmen. All applicants seeking admission must complete and submit an Application for Admission. A student should also request that his or her high school counselor send to the Office of Admissions a current official 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 that the registrar at each college send an official transcript of all work attempted to the Office of Admissions at OSU. Students who have earned 23 or fewer hours of college-level credit should also follow the procedure outlined above for first-time freshmen.

Readmission. A student who has attended OSU but was not enrolled during the immediate past semester (except the summer session) must file an Application for Readmission. A student who has enrolled in another college or university since last attending OSU, must file a transcript from each school. Admission status will be determined after an evaluation of the previous work has been made.

Residential Life

All freshmen are required to live on campus their first year. For exceptions, see the "Residential Life" section of the Catalog. The University offers a variety of living and food service arrangements to satisfy most students. A Residence Hall Application is included in the Application Packet and should be submitted early in the senior year of high school to ensure a first-choice assignment. Opportunities abound for transfer students who desire to experience life on campus.

Freshman Admission

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

Admission Requirements (Residents and Nonresidents)

To be admitted in good standing, students must graduate from accredited high schools or have earned a General Education Diploma (GED), and meet both the performance and curricular requirements listed below. (Accredited high schools are those fully accredited by one
Performance Requirements. To be admitted in good standing for the Fall 1995 or Spring 1996 Semester, students must meet the curricular requirements listed below, 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 performance requirements:

1. achieve 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-third of their graduating classes;

2. attain a composite score of 21 or higher on the enhanced ACT or a 990 or higher on the SAT.

Curricular Requirements. All students beginning college work after July 1, 1988 must have completed the following curricular requirements for admission:

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

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

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

OSU requires a non-refundable application fee of $15 for all applicants. The fee must accompany a student's Application for Admission.

Special Freshman Admission Programs

Adult Admission. Adults 21 years of age or older or individuals on active military duty may be admitted, after careful consideration is given in determining the probability of academic success of the student. It is the opinion of Oklahoma State University that factors such as maturity of the individual, job skills and life experiences, motivation, ability to benefit, and access to educational programs should be considered in addition to past academic achievement in determining probability of academic success.

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

Home Study or Unaccredited High Schools. An individual who is a graduate of a private, parochial, or other nonpublic high school which is not accredited by a recognized accrediting agency is eligible for admission to the University if:

1. The student has graduated from high school or a home study program, and
2. The student has attained an enhanced ACT composite score of 21 or higher, or an SAT composite score of 990 or higher, and
3. The student has satisfied the high school curricular requirements as certified by the school official or, if home study, the parent.

Correspondence Study Enrollment. Admission to the University is not required for enrollment in correspondence work. However, academic credit for correspondence work will not be applicable toward a degree until the student has been formally admitted to the University and has secured the approval of the appropriate academic officer for such credit.

Non-degree Option. Students who wish to enroll in courses without intending to pursue a degree may be permitted to enroll in up to nine credit hours without satisfying admission requirements. If a student wishes to enroll in additional course work (over the nine hours allowed) he or she will be required to satisfy admission requirements.

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 below, be admitted provisionally as a special student.
2. An eleventh grade student enrolled in an accredited Oklahoma high school may be admitted provisionally as a special student, if he or she meets requirements a. and b. above, and if the student has achieved a composite score which places him or her at or above the 90th percentile on the ACT using Oklahoma norms, or whose combined verbal and mathematical score on the SAT places him or her at or above the 90th percentile using national norms.

If the student's ACT or SAT composite score is not at the 90th percentile, as detailed above, but the student's sub-score(s) is at the 90th percentile, he or she may enroll in course work in the discipline with the required score, providing the student does not have a curricular deficiency in the subject area.

3. A student receiving high-school-level instruction at home or from an unaccredited high school may be admitted provisionally as a special student if he or she meets the requirements below:

a. He or she must be 17 years of age or older and meet the standardized test admission requirements of the institution for which the application is being made; or
b. He or she must be 16 years of age and have achieved a composite score which places him or her at or above the 90th percentile on the American College Test (ACT) using Oklahoma norms or whose combined verbal and mathematical score on the Scholastic Aptitude Test (SAT) places him or her at or above the 90th percentile using national norms.

c. If the student's ACT or SAT composite score is not at the 90th percentile, as detailed above, but the student's sub-score(s) is at the 90th percentile,
he or she may enroll in course work in the discipline with the required score, providing the student does not have a curricular deficiency in the subject area.

4. A high school student admitted under the provisions set forth in 1. and 2. above may enroll in a combined number of high school and college courses per semester not to exceed a full-time college work load of 19 semester credit hours. For purposes of calculating work load, one high school credit course shall be equivalent to three semester credit hours of college work.

5. A student who is otherwise eligible under this policy may enroll in a maximum of nine semester credit hours during a summer session, without the necessity of being concurrently enrolled in high school classes during the summer term. The completion of the high school curricular requirements shall not be required of concurrently enrolled high school students for purposes of admission. (Students may only enroll in curricular areas where the student has met the curricular requirements for college admission.) Concurrently admitted high school students will not be allowed to enroll in any zero-level courses designed to remove high school deficiencies.

6. Assessment/Course Placement: To help ensure that a student possesses the skills necessary to be successful in college, he or she must obtain a 19 ACT subject score(s) in science reasoning, mathematics, and/or English to enroll in course work in the respective subject area(s). The student must score at 19 or higher in reading to enroll in any other collegiate course(s) outside the subjects of science, mathematics and English. If the subject score(s) is below 19, the student may enroll in college-level course work if, through OSU's predictive research formula, the student shows readiness for college-level work or takes an assessment test that indicates placement in college-level work.

7. Once a student is concurrently enrolled at OSU, he or she may continue enrollment, provided that during the concurrent enrollment period the student achieves a college grade-point average of 2.00 or higher, and upon graduation from high school meets both the performance and curricular requirements for admission.

Transfer Admission
OSU requires a non-refundable application fee of $15 for all applicants. The fee must accompany a student's Application for Admission.

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

1. Students who would have satisfied the admission requirements for the fall or spring semester as first-time freshmen, but chose to enroll at another institution within the state, are eligible to enroll as transfer students. Students with more than six hours of college-level credit must satisfy the retention standards listed below for the hours being transferred.

2. Students who would not 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 college-level 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:

- 0 through 30 semester hours: 1.70
- 31 or more semester hours: 2.00

Nonresidents of Oklahoma
Students may transfer to Oklahoma State University from outside the state according to the following criteria:

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

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

Pre-engineering (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 "Admission Requirements" in the "College of Engineering, Architecture and Technology" section.)

Transfer Probation. Any transfer student falling slightly below the admission requirements listed above may be considered for admission on probation.

English Proficiency Requirement. All new applicants for undergraduate study for whom English is a second language are required to present a score of 500 or above on the Test of English as a Foreign Language (TOEFL).

Readmission. A student who has attended OSU but was not enrolled during the immediate past semester (except the summer session) must file an Application for Readmission. A student who has enrolled in another college or university since last attending OSU, must file a transcript from each school. Admission status will be determined after an evaluation of the previous work has been made.

International Admission
International students are required to meet academic performance standards which are equivalent to those established for all nonresident applicants.

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. $15.00 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 hours of college-level credit 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.
e. The international student transferring from another U.S. institution with more than 24 semester hours of college-level credit in the U.S. need only to have his or her official transcripts from each college or university attended forwarded directly to the Office of Admissions.

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. The University has no financial aid available for international students.

5. An international student with F visa status transferring from another U.S. institution must have his or her 1-20 processed for transfer by the Office of International Student Services at OSU within 15 days of the first enrollment. The student with J Visa status should contact his or her foreign student advisor at his or her current institution and also the international student admissions counselor at the Office of Admissions at Oklahoma State University prior to making his or her transfer.

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 postsecondary institution in his or her own country or another international country; or
2. A student who has earned a minimum of seven 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," stated in the Catalog. The international student is eligible for academic admissibility under this criterion only if he or she was 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 hours of college-level credit at another U.S. institution and then meeting the criteria stated for "Nonresidents of Oklahoma-Transfer Admission," stated in the Catalog.

**Readmission (International Students).** An international student who has attended OSU but did not attend OSU the immediate past semester must file an Application for Readmission and an updated Financial Guarantee. 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 meets minimum University and department standards, and his or her disciplinary record is satisfactory, he or she will be readmitted to OSU.

**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 hours of college-level credit 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 hours of college-level credit 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 admissibility into the engineering program after earning at least 24 semester hours of college-level credit 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. A transferring international student must process the transfer with the institution to which the student is transferring. If a student is out of status with INS, that student must reinstate himself or herself with INS before being allowed to enroll at OSU. Questions regarding a student's immediate immigration status must be directed to International Student Services.

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 almost no financial assistance available for international students. INS requires that international students file a statement with the University which shows adequate financial support for their education. OSU has its own financial guarantee form that international students need to complete as a requirement to receive the 1-20 or IAP 66.
Students should not plan on financing their education with employment. Students who are maintaining their immigration status, and making appropriate progress toward their degrees are eligible to apply for on-campus University employment for 20 hours per week.

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.

Beginning the Enrollment Process

Enrollment Information. After admission is granted, all students will receive detailed enrollment information. The fall semester enrollment process for freshmen is completed during scheduled orientation sessions conducted on campus during the summer. Parents are welcome and are encouraged to participate in the enrollment process with the student.

Advance Fee Payment. All new students are required to submit a $40 advance fee payment prior to the beginning of the enrollment process. This fee remains in the student's OSU account while he or she is attending the University; it can be refunded upon withdrawal from the University or applied to any outstanding charge during the student's last semester.

Immunizations. A record of immunizations must be submitted by each new student by the eighth week of the semester. The student will receive the form Medical History and Immunization Schedule at enrollment, or the student may contact the OSU Wellness Center.

Physical Examination. All new students must complete a physical examination as part of the admission process. OSU Board of Regents policy allows two options to satisfy this requirement: the student may complete an OSU Wellness Center Health Risk Assessment (HRA) furnished by OSU; or the student may go to a physician of choice at his or her expense, have a physical exam, and submit the physical exam report (including immunization data) to the OSU Wellness Center.

Regardless of which option is chosen, all new students are required to submit an immunization history. This requirement includes proof or documentation of vaccination for:

- Measles-two doses of measles vaccine
- Mumps
- Polio
- Rubella
- Tetanus-Diphtheria

Refer to the information supplied in the HRA packet for details associated with the immunization requirement.

New students will automatically be billed $20.00 for the HRA during the first semester of enrollment. Students exercising the second option will have the fee waived upon receipt of their physical exam forms at the OSU Wellness Center by the eighth week of the semester.

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 admission requirements. Although the following policy statement is not necessarily inclusive of all regulations governing the classifications of resident and nonresident students for the purpose of fee payment, it should, nevertheless, be of assistance to most students in determining their residence status. Administration of the state's 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.

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 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 havecome 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 declared an Oklahoma resident along with his or her spouse and dependent children so long as he or she continues in such full-time employment capacity.

**Enrollment and Records**

Robin H. Lacy, Registrar  
Gordon L. Reese, Interim Associate Registrar  
Darlene Wilson, Administrative Associate  
Paula M. Barnes, Coordinator, Athletes' and Veterans' Eligibility  
Joan M. Payne, Coordinator, Certification Services  
Carl E. Jordan, Coordinator, Enrollment Services and Student Data  
Linda J. Bentley, Coordinator, Publications  
Shirilyn Dehls, Coordinator, Student Records

**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.") All new freshman and transfer students are required to submit an advance fee payment prior to participation in the enrollment process.

**First-time Students (Freshmen and Transfer)**

The fall enrollment and orientation period for new freshmen takes place during the summer months, while enrollment for new transfer students begins in the spring. 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 the fall orientation 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 belonging 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 on the Thursday before classes start in August. Specific information is mailed during the summer months to all new students who have applied for admission.

**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 advisers can sign a Trial Schedule form for students wishing to enroll in the Sectioning Room of the Student Union, or they can authorize an on-line enrollment clearance for students wishing to self-enroll either by touch-tone telephone or by the IDS system terminals. 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 enrolling. Wentz Scholars, President's Distinguished Scholars (PDS), President's Leadership Council (PLC) recipients, and participants in the OSRHE Academic Scholars program 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. Lost or stolen identification cards will be replaced at a nominal fee with proper identification from the student.

Change of Schedule
Adding Courses. Approval of the student's advisor 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 course may not be dropped without the approval of the student's academic advisor.

Dropping Courses. Courses may not be dropped without the approval of the student's academic advisor. 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 "W" (dropped) or "F" (failing) as assigned by the instructor. The grade of "F" 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 not drop a course and shall be assigned only the grade of "A," "B," "C," "D," or "F" or (when appropriate) "I," "NP," "P," "S," "U," or "X" by the instructor at the end of the semester. (Exceptions to this policy may be allowed by petition due to extraordinary circumstances. The petition process is initiated in the student's dean's office. A petition requires the signatures of the student's instructor, adviser and dean with the grade of "W" or "F" 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" or "F," (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 "W" (withdrawn) or "F" (failing) as assigned by the instructor of each course. The grade of "F" 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," "S," "U," or "X" by the instructor of each course at the end of the semester or summer session.

Vehicle Registration and Parking Regulations
Any vehicle driven 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 completed Vehicle Registration scan form, 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.

A copy of the OSU Public Safety Guide is available from the Parking Office, 104 USDA Building, located at Farm Road and Orchard Street.

Faculty and Staff Enrollment in University Courses
The advance fee payment is waived for permanent full-time employees. These employees may audit courses after securing an audit form and paying one-half the general fee. Any individual 65 years or older may audit a class at no charge.

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

Freshman Progress Reports

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

Grade Reports

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

Official Transcripts

All official transcripts of students' academic records at OSU are prepared and released by the Office of the Registrar. The official transcript includes the academic record, both undergraduate and graduate. It contains the signature of a University official and the official, imprinted seal of the University. Primary usage of the official transcript is for application for transfer to other academic institutions and for employment purposes.

Transcripts of academic records at the University may be ordered in person or by mail from the Office of the Registrar, Transcripts Section, 103 Whitehurst, Oklahoma State University, Stillwater, Oklahoma 74078-0102. Official transcripts will not be available until approximately one week 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 and degree 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.

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. 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 addresses; telephone number; date and place of birth; major field of study; weight and height of students participating in officially recognized sports; dates of 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 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 the 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.

The figures which follow are for the 1994-95 academic year. These fees are subject to change without notice, as provided by University, Board of Regents, and OSRHE policies.

### Oklahoma Residents

<table>
<thead>
<tr>
<th>Lower-division courses</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$48.60</td>
<td>General fee</td>
</tr>
<tr>
<td>$2.86</td>
<td>Student activity fee</td>
</tr>
<tr>
<td>$1.00</td>
<td>Student assessment fee</td>
</tr>
<tr>
<td>$4.30</td>
<td>Facility fee</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee</td>
</tr>
<tr>
<td>$58.26</td>
<td>Total per credit hour</td>
</tr>
<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Upper-division courses</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$51.84</td>
<td>General fee</td>
</tr>
<tr>
<td>$2.86</td>
<td>Student activity fee</td>
</tr>
<tr>
<td>$1.00</td>
<td>Student Assessment fee</td>
</tr>
<tr>
<td>$4.30</td>
<td>Facility fee</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee</td>
</tr>
<tr>
<td>$61.50</td>
<td>Total per credit hour</td>
</tr>
<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graduate-division courses</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$68.85</td>
<td>General fee</td>
</tr>
<tr>
<td>$2.86</td>
<td>Student activity fee</td>
</tr>
<tr>
<td>$1.00</td>
<td>Student Assessment fee</td>
</tr>
<tr>
<td>$4.30</td>
<td>Facility fee</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee</td>
</tr>
<tr>
<td>$78.51</td>
<td>Total per credit hour</td>
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<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

### Nonresidents of Oklahoma

<table>
<thead>
<tr>
<th>Lower-division courses</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$48.60</td>
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</tr>
<tr>
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<td>Student assessment fee</td>
</tr>
<tr>
<td>$4.30</td>
<td>Facility fee</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee</td>
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<tr>
<td>$108.00</td>
<td>Nonresident tuition</td>
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<tr>
<td>$166.26</td>
<td>Total per credit hour</td>
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<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
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</tbody>
</table>

<table>
<thead>
<tr>
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<td>Student activity fee</td>
</tr>
<tr>
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</tr>
<tr>
<td>$4.30</td>
<td>Facility fee</td>
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<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee</td>
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<tr>
<td>$121.77</td>
<td>Nonresident tuition</td>
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<tr>
<td>$183.27</td>
<td>Total per credit hour</td>
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<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graduate-division Courses</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$68.85</td>
<td>General fee</td>
</tr>
<tr>
<td>$2.86</td>
<td>Student activity fee</td>
</tr>
<tr>
<td>$1.00</td>
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<tr>
<td>$4.30</td>
<td>Facility fee</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee</td>
</tr>
<tr>
<td>$149.31</td>
<td>Nonresident tuition</td>
</tr>
<tr>
<td>$227.82</td>
<td>Total per credit hour</td>
</tr>
<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

### College of Veterinary Medicine

<table>
<thead>
<tr>
<th>Oklahoma Residents</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,125.00</td>
<td>General fee per semester</td>
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<tr>
<td>$2.86</td>
<td>Student activity fee per credit hour</td>
</tr>
<tr>
<td>$4.30</td>
<td>Facility fee per credit hour</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee per cr. hr.</td>
</tr>
<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nonresidents of Oklahoma</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,125.00</td>
<td>General fee per semester</td>
</tr>
<tr>
<td>$2.86</td>
<td>Student activity fee per credit hour</td>
</tr>
<tr>
<td>$4.30</td>
<td>Facility fee per credit hour</td>
</tr>
<tr>
<td>$1.50</td>
<td>Library automation and mainframe fee per cr. hr.</td>
</tr>
<tr>
<td>$3,921.50</td>
<td>Nonresident tuition per semester</td>
</tr>
<tr>
<td>$2.00</td>
<td>The Daily O'Collegian fee per semester</td>
</tr>
<tr>
<td>$46.00</td>
<td>Student Health Center fee per semester</td>
</tr>
</tbody>
</table>

Students enrolled in six or fewer hours pay only $7.00.
College of Veterinary Medicine students who repeat course work will be charged $100 per credit hour for Oklahoma residents and nonresidents. Nonresidents will also be charged tuition of $179.50 per credit hour.

Fees for Special Services
All students pay special fees each semester to contribute to the betterment and general welfare of the campus community. The activity fee provides partial support to such programs, services and organizations as the Student Government Association, collegiate student councils and related student organizations, Allied Arts, fine arts, athletics, intramural activities and sports clubs, minority student organizations, and the Student Activities Office. User's fees, other fund-raising activities, and, in some cases, membership dues provide the remaining support to make these positive, constructive, and meaningful programs and services available to all students.

The assessment fee provides for skills assessment and evaluation of students' capabilities at various stages of their academic careers, and to get feedback from students regarding their course work.

Students regularly enrolled in the University are assessed facility, health and activity fees that entitle them to use the Student Union, the Colvin Physical Education Center, and the Health Clinic, and that provide support for student governance, organizations and programs. 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 be charged health and activity fees when enrolled (1) only in a specialized course(s) offered for a special-interest group and not in any other course(s) in the University or (2) 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. Other extenuating circumstances may be cause to consider denying use of and charge for these facilities or participation in activities sponsored by these fees.

The library automation and mainframe fee defrays the cost of equipment, software, and other aspects related to operating the on-line computerized library service.

Students enrolled in seven or more hours per semester will be assessed a health fee which includes a fee for comprehensive health and pharmacy services and a fee for bond indebtedness. Students enrolled in six or fewer hours will be assessed the bond indebtedness fee only (which does not allow use of the medical services); however, health and pharmacy services are available if the student chooses to pay the full fee.

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 (no charge)
Nationally developed national agency rate
Application fee for all undergraduate students $15.00
Application fee for all graduate students $15.00
Audit without credit same as Oklahoma residents general fee
Automobile parking permit (per year):
Campus residents $30.00
Off-campus residents $40.00
Correspondence course fees (per credit hour)
$55.00
Extension course fees (per credit hour):
Undergraduate courses:
Lower division $48.60
Upper division $51.84
Graduate courses $68.85
Graduation fees:
Bachelor's degree $15.00
Master's degree $20.00
Doctor of Veterinary Medicine degree $20.00
Specialist in Education, Doctor of Philosophy, Doctor of Education degrees $50.00
Thesis binding fee each $6.00
Dissertation microfilming fee each $35.00
Health risk assessment fee for first-time students $20.00
International student status maintenance fee:
per semester $15.00
per summer session $10.00
Late enrollment fee:
first day $5.00
maximum $10.00
Remedial
Supplementary fee (per credit hour, in addition to the general fee)
$24.00

Transcript $3.00
There is no charge for transcripts for OSU retirees or persons who are 65 years of age or older.

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, 307 Center for International Trade Development.

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 audit a class at no charge.

Oklahoma State University 19
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 100 percent refund of 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

A student withdrawing from a short session will receive a prorated refund based on the above schedule.

Repayment Policy

Financial aid is considered to be used first for direct educational costs (tuition and fees) and, if the student is in University housing, for room and board. Therefore, if a student financial aid recipient withdraws and is eligible for a refund of tuition and fees and/or room and board, all or part of this refund will be used to reimburse the Title IV financial aid program(s) up to the amount of assistance that the student received from the program(s).

If a student receives cash from financial aid in excess of non-institutional costs, part of this aid may be required to be repaid; the amount of the repayment depends upon how many weeks the student was enrolled and the amount of aid received.

When there are multiple disbursements of aid, the assumption is made that the first disbursement(s) is used to pay institutional charges. Therefore, if cash is disbursed, the cash is derived from the last disbursement(s) prior to the disbursement of cash.

Refunds and repayments are allocated to Title IV programs in the following order:

- Refund: Part B Loans (Stafford, SLS); Direct Loans; Perkins Loans; Pell; SEOG.
- Repayment: Perkins; Pell; SEOG.

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 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 1994-95.

Residence Halls

- Men’s Halls
  - East Bennett
  - Kerr
  - Parker
  - Stout
  - Wentz
  - Willham South
  - Willham North
  - Iba
  - Bennett Apartments

- Women’s Halls
  - West Bennett
  - Drummond
  - Parker
  - Stout
  - Wentz
  - Willham North
  - Iba

Meal Plan Charges (All halls.)

- Unlimited passes $935.00
- 250 passes/semester $893.00
- 15 passes/week (continuous) $856.00
- 18 passes/week $793.00
- 10 passes/week $740.00

Room Rent Charges. All halls provide a telephone instrument and local phone service in each room, and cable TV in all halls except the Bennett Apartments for 1.6 times the double room rate.

- Kerr, Drummond, Parker, Waltham
- North and South Residence Halls (Air-conditioned and room cable TV.)

Room Rent Charges

- Double Room $879.00
- East and West Bennett Residence Halls
  - Double Room $752.00
- Iba Residence Hall (Air-conditioned) (Iba is open only to students who are sophomores and above.)
  - Double Room $848.00
- Stout Residence Hall (Stout is open only to students who are sophomores and above.)
  - Double Room $695.00
- Wentz Hall (Air-conditioned and room cable TV). Assignment to Wentz Hall follows these priorities: (1) students enrolled in the Graduate College; (2) undergraduates who are 21 years of age or older, or sophomore level or higher who need housing during break periods. Other students may be granted this option upon special request; (3) under-
Estimated Total Expenses for Students

An estimated budget (based on 1994-95 figures) for an undergraduate student at OSU is as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Resident</th>
<th>Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and Fees (Based on 14 credit hours)</td>
<td>$880.00</td>
<td>$2,490.00</td>
</tr>
<tr>
<td>University Housing and Board $1,670.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Based on average, double occupancy, residence hall charges)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks and Supplies</td>
<td>$380.00</td>
<td></td>
</tr>
<tr>
<td>Ave. Misc. Personal Expenses $1,225.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Per Semester</td>
<td>$4,155.00</td>
<td>$7,675.00</td>
</tr>
<tr>
<td>Nonresident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuition and Fees (Based on 14 credit hours)</td>
<td></td>
<td></td>
</tr>
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<tr>
<td>Ave. Misc. Personal Expenses $1,225.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Per Semester</td>
<td>$5,765.00</td>
<td></td>
</tr>
</tbody>
</table>

Financial Obligation

Enrollment at Oklahoma State University incurs certain obligations and commitments on the part of the individual student, one of which is the student's responsibility to pay in a timely manner all financial amounts owed to the University. 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. Students with financial difficulty should immediately contact the Office of the Bursar for assistance.

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 that is mailed to the student's local address. Students are responsible for ensuring that the address maintained and shared by the offices of the Registrar and the Bursar is current and accurate. For convenience, students may update their addresses in either office. Failure to receive a bill does not relieve the student from the financial obligation, any finance charges, and other penalties that may occur if the account is not paid by the monthly due date.

All fees (required and optional) and tuition associated with the student's enrollment are due in the Office of the Bursar no later than 4:30 p.m. on the 15th day of each month following billing. Fall semester fees are due by September 15, spring semester fees are due by February 15, and summer session fee due dates vary depending on the session. All delinquent accounts in excess of $40 will accrue an interest penalty at the rate of 1.5 percent monthly (19.56 APR).

Accounts must be cleared before the student can obtain the release of any records, obtain a transcript, receive a diploma, or enroll at Oklahoma State University for subsequent semesters. Students having difficulty in meeting their financial obligations should contact the Office of the Bursar for assistance.

It is the policy of the University to apply all financial aid to the student's account, withhold an amount equal to all charges showing on the student's account for the semester (fees, tuition, housing, etc.) and then refund the balance. This policy is in accordance with the U.S. Department of Education, The Federal Student Financial Aid Handbook instructions.

Financial Aid

Charles W. Bruce, Director
Patrick Kennedy, Assistant Director, Administrative Services
Gary Garoffolo, Assistant Director, Programs
Linda K. Good, Coordinator, College Work Study Programs
Margaret Betts, Coordinator, Information Services
Cathy Bird, Coordinator, Records Management
Jackie Allen, Coordinator, Reports
Bonnie Joerschke, Senior Counselor
Amanda Bayless, Counselor
Gary Davidson, Counselor
Judith Finnegan, Counselor
Beverly Morris, Counselor
Sandra Dearing, Counselor

Students who need financial assistance to attend college are encouraged to consider the many types of financial aid available through the OSU Office of Student Financial Aid. These programs...
include scholarships, grants, loans, and part-time jobs.

Financial aid at OSU is awarded on the basis of demonstrated financial need. Each student who wishes to be considered for need-based assistance should complete the Free Application for Federal Student Aid (FAFSA) and submit it to the processing center in Iowa City, Iowa as soon after January 1 as possible to receive aid for the succeeding academic year. FAFSA packets are available at the Office of Student Financial Aid as well as at most colleges and high schools. Early application is encouraged due to the high demand for available money.

An analysis of the FAFSA is used to determine demonstrated need for federal, state, and institutional programs such as Federal Pell Grants, Federal Supplemental Educational Opportunity Grants (FSEOG), Oklahoma Tuition Aid Grants (OTAG), Federal Perkins Loans, William D. Ford Federal Direct Loans (previously Stafford Loans), Federal Work-Study (FWS), and Fee Waivers.

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

Wentz Service Awards provide students with jobs designed to develop skills beneficial to future employment while working in a University office or community service program. These awards are offered through each of the seven colleges at OSU as well as a number of administrative offices on campus.

The Federal Direct Parent Loan for Undergraduate Students (PLUS) Program and the William D. Ford Federal Direct Unsubsidized Loan allow graduate students and independent undergraduates, as well as parents of dependent undergraduates, to borrow through participating lenders.

To be considered for financial aid, a student must:
1. Be a U.S. citizen or a permanent resident of the United States. Those who are not citizens or permanent residents are not eligible for federal or state assistance.
2. Be enrolled as a degree or certificate-seeking candidate, including a program of study abroad.
3. Not be in default on a Federal Stafford, Federal PLUS/SLS, or Federal Perkins Loan.
4. Not owe a repayment to the Federal Pell Grant, FSEOG, or OTAG program.
5. Meet minimum satisfactory academic progress standards.

6. Be prompt in responding to any requests for additional information made by the Office of Student Financial Aid. Students and parents are invited to contact the Office of Student Financial Aid for information regarding financial aid programs or to make an appointment with a financial aid counselor to discuss specific eligibility requirements.

Grants

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

Federal Pell Grant eligibility is determined by the U.S. Department of Education using a congressionally-approved formula.

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

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

Federal Work-Study

This program is designed to help students meet their educational expenses through part-time employment. The Office of Student Financial Aid determines award amounts on the basis of financial need. While all Federal 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 they hold. Eligible students may be employed by any participating office or department at OSU or at an off-campus, non-profit agency. By attempting to place students in areas in which they are interested, the Federal Work-Study Program helps to stimulate the development of worthwhile work experience for the student while attending college.

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 short-term loan program provides up to a maximum of $300 per semester (less a $10 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 loan 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.


The rate of interest on a Federal Perkins Loan during the period of repayment is five percent simple interest per annum on the unpaid balance. Funding in this program is limited and is awarded to applicants who demonstrate significant financial need.

The rate of interest on the William D. Ford Loan varies for first-time borrowers, but cannot exceed nine percent. The rate of interest on a Federal Direct Parent Loan is variable but cannot exceed 10 percent.

Scholarships

A large number of OSU undergraduate and graduate students receive fee waivers. Numerous other cash scholarships are awarded through the various OSU departments, colleges and other offices.
Fee and Tuition Waivers
Fee and Tuition Waivers are awarded to undergraduate and graduate students on the basis of both demonstrated financial need and academic achievement. Awards range from approximately $750 to $1,500 per year. Freshman fee waivers are awarded to entering students who have attained a high scholastic standing in high school. Transfer fee waivers are offered each year to outstanding students transferring from two- and four-year colleges to OSU. Applicants should apply by February 1 for priority consideration. Further information may be obtained from the offices of High School and College Relations and University Scholarships.

Fee and tuition waivers for upperclass students are awarded each year to sophomores, (who have completed at least 28 credit hours), juniors, and seniors who have outstanding academic records. Applications for these scholarships can be obtained from the offices of Student Financial Aid and University Scholarships, and must be received by March 1.

Graduate students should contact their academic departments and the Graduate College regarding application procedures and scholarship deadlines.

Nonresident students should also inquire about policies for waivers of out-of-state tuition.

Wentz Service Awards
This program provides students with work settings in which they can develop skills to benefit them in their future employment. Application is made directly to any of the respective colleges or participating administrative offices at OSU. Minimum requirements are a 3.20 GPA, completion of at least 28 hours prior to the beginning of the award period, and full-time status during the award period. Service scholarship recipients earn a minimum wage of $4.35 per hour and may earn up to $1,600 per year. Recipients will be notified about their awards and work assignments by either the colleges or administrative offices through which they receive their scholarships. Interested students should contact the Office of Student Financial Aid.

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

Student Employment
The Office of University Personnel Services, Employment Section, provides assistance to OSU students seeking part-time employment. Students are informed of on-campus job opportunities by notices posted on a bulletin board outside room 407 Whitehurst. Students may obtain job applications and referral information in room 407 Whitehurst. The largest number of jobs are available at the beginning of each semester; however, jobs do become available throughout the year.

Jobs on campus usually offer 12 to 20 hours of work per week in clerical, technical, food service or general labor positions. Rate of pay and work schedules vary. Ideally, students seeking on-campus work should schedule their classes to allow for a block of four hours free time during the morning or afternoon, Monday through Friday. Off-campus job opportunities are posted at 360 Student Union, University Placement. More flexible hours may be available in off-campus jobs.

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 Kerr-Drummond, Wentz, Parker, and Willham North and South. Wentz Hall provides year-round housing for graduate and undergraduate students who are 21 years of age or older. (Other students who need continuous housing should request Wentz.) Stout and Iba halls are available for students of sophomore standing and above. Parker is open only to students active in the Honors Program.

The Department 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 become involved in the residence halls. Residence halls and dining centers offer numerous opportunities for student leadership. More than 500 students are involved in planning and leading educational, recreational and social activities within the residence halls.

Residence hall living is relatively inexpensive. Over $1,400 per year is saved by the average student living in residence halls versus living off campus. Residence hall rates include all utilities including telephone (cable TV in some halls.) The 18-meal plan costs approximately $2.50 per meal. The in-hall laundry facilities are convenient and economical as is the on-campus parking. Residence hall rates rarely increase during the academic year.

Residential Life

Bob Huss, Director of Residential Life
Eddie Denman, Assistant Director of Residential Life-Administrative and Business Services
Bill Ryan, Assistant Director of Residential Life
Kent Sampson, Assistant Director of Residential Life
Dave Stoddart, Assistant Director of Residential Life

The Department of Residential Life exists to aid its residents’ academic pursuits. Students who live on campus are more likely to graduate in four years and maintain higher grades than their off-campus counterparts. The Department of Residential Life provides residence hall space for approximately 5,000, apartments for more than 700, 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; being 21 years of age or older; 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 Department 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 10 months before the desired occupancy in order to receive the preferred on-campus housing location.

Student Services

Residential Life-Administrative and Business Services

Eddie Denman, Assistant Director of Residential Life

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Students are offered several lifestyle options from which to choose, such as floors and houses for fine arts, foreign languages, honors, intensive study, engineering, and wellness. The Independent Living Centers of Stout, Iba and Wentz provide more student responsibility including a 24-hour visitation option.

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

Students who live on campus enjoy the opportunity to participate in the on-campus meal plan. Students may choose from five different meal plans, (freshmen are required to take at least 10 meals per week) depending on their individual needs. Some non-freshman students choose not to be on the meal plan. A variety of offerings are available in the four dining centers (Bennett, Kerr-Drummond, Scott-Parker-Wentz, and Wilham cafeterias). Any student may eat any meal in any of the four dining centers. Each dining center offers a unique menu as well as the standard cafeteria selection. Specialty menus include delicatessen, health club, country cooking, Italian, fast food, Mexican, Asian, and others. These specialty plans vary as the students’ needs change. Mazzio’s Pizza restaurant is housed in Kerr-Drummond.

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

Mobility Impaired Student Housing

All residence halls offer some housing for students who have impaired mobility. Upon notification, the Department of Residential Life routinely modifies rooms to meet an individual’s special needs.

University Apartments

More than 700 all-brick apartments are available within walking distance of the campus. These apartments serve students in the following priority: families, single graduate 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 with optional furnishings.

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

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

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

University Apartments provide an on-site staff member, an apartment assistant who is readily available to the residents. Each apartment assistant has responsibility for about 90 apartments. The assistant’s duties include helping residents resolve inter-apartment conflicts, meet neighbors and find appropriate community services. They also provide information about the facilities and the University, and provide referrals to appropriate University offices for residents’ needs. The apartment assistant can be a very helpful person for all residents.

For more information contact the University Apartments Office, 120 Brunley, Oklahoma State University, Stillwater, Oklahoma 74078.

Students with Children

Information on child care in the Stillwater community is available at the following locations on campus:

- Family Resource Center - 1207 W. McElroy, Anne Benes, Coordinator
- Nontraditional Student Services - 060 Student Union, Marie Basler, Coordinator
- Adult Student Organization - 030E Student Union
- Student Government Association - 040 Student Union

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.

Student Activities

Jan Carlson, Manager, Student Activities
Barbara Dunn, Program Coordinator, Allied Arts
Marie Basler, Coordinator, Nontraditional Student Services
Muhrizah Brunken, Program Coordinator, SUAB and Student Union Programs
Joyce Montgomery, Coordinator, Volunteer Center

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

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 program development within the Student Union. These programs include films, speakers, exhibits, Freshman Follies, as well as other special events within the Student Union.

Counseling Services

Patrick M. Murphy, Director

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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

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 individual 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, the Career Information Center, Career Interest Testing, and Career Outreach Programs.

Students with Disabilities Services

Debra Swoboda, Coordinator

Students with Disabilities Services is committed to providing support services to students with physical and learning disabilities. The underlying philosophy of the program is to provide support services that will facilitate the academic progress of each individual student. A plan for services is developed on an individualized basis and may include academic advisement, specialized testing, recorded textbooks, academic accommodations, technological assistance, and other services as requested. Students may initiate a request for services by contacting Students with Disabilities Services.

International Student Services

Elaine Burgess, Coordinator
Regina Henry, International Student Adviser
Anna Ramirez, International Student Adviser

The International Student Services office (ISS) provides assistance to more than 1,800 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 assistance 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, immigration matters, orientation programs, and advisement to groups, are among the services offered. Non-immigrant students can apply for internal employment clearances in the office.

Pre-arrival information is sent to new students. Orientation and assistance with housing, banking, enrollment, etc., are offered to newly-arrived students. In collaboration with other OSU departments and community groups, a variety of programs are presented throughout the year. Interested student volunteers participate and assist with many 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 Health Center

Steve Rogers, C.H.E., M.B.A., Director
Ronald R. Sanders, M.D., Chief of Staff
Phillip A. Nokes, D.O., Staff Physician and Assistant Clinical Professor, OSU-COM
Kenneth B. Smith, D.O., Staff Physician and Assistant Clinical Professor, OSU-COM
Thomas L. Hansen, M.D., Staff Physician
Huc X.Ngheim, M.D., Staff Physician
Mary Sue Pinski, M.D., Staff Physician
Lanny F. Trotter, M.D., Staff Physician

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

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

The OSU Student Health Center maintains a staff of full-time physicians, mental health professionals, nurses, laboratory, pharmacists 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 psychiatry and radiology.

The Student Health Center is an ambulatory primary care, facility, designed to provide cost-effective, physician-directed health care to students. In the event a medical condition exists that is beyond the scope of the services offered, referrals can be made to a family physician.
or a local physician in Stillwater. Emergency services are offered by Stillwater Medical Center 24 hours a day.

There are no charges for office visits to see the physicians. This service is covered by the designated health fee paid by the student. A fee is charged to cover direct costs on laboratory, x-ray, pharmacy, and elective services.

For more information contact the Student Health Center, 1202 West Farm Road, Oklahoma State University, Stillwater, Oklahoma, 74078.

Multicultural Development and Assessment Center

Howard Shipp, Director
Teresa Newson, Coordinator, Black Students
Rolando J. Diaz, Coordinator, Hispanic and Vietnamese-American Students
Pete G. Coser, Coordinator, Native American Students

The Multicultural Development and Assessment Center (MOAC) 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.

The MDAC 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, MDAC 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.

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 who earn a minimum of 39 honors credit hours and complete the Departmental or College Honors award, as well as the General Honors award, with 3.50 OSU and cumulative grade-point averages at graduation, receive the bachelor’s degree with honors, including a special entry on their transcripts and special honors diplomas.

Additional advantages for active participants in the Honors Program (minimum of three honors credit hours per semester and nine honors credit hours per two consecutive semesters) include use of the Honors Program Study Lounge in the Edmon Low Library (with Apple Macintosh computers), extended check-out privileges for library materials, priority enrollment for the following semester, and an honors housing option in the residence halls.

Admission of new freshmen to the University Honors Program is based on an ACT composite score of 27-29 with a high school grade-point average of 3.75 or higher (or ACT composite score of 30 or higher with a high school grade-point average of 3.50 or higher). Application forms are included in the OSU Application for Admission. Students other than new freshmen may be admitted to the program on the basis of their cumulative grade-point averages (1-59 hours earned: 3.25, 60-93 hours earned: 3.37, 94 or more hours earned: 3.50).

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

Special Programs, Services and Facilities

Special Programs

The University Honors Program
Robert L. Spurrier, Jr., Director
K. Celeste Campbell, Coordinator, Honors Communication and Advisement
Suzanne Hackney, Honors Adviser
Duke Holden, Honors Adviser

Oklahoma State University is an active member of the National Collegiate Honors Council and the Great Plains Honors Council. The University Honors Program is composed of a university-wide General Honors component and specialized upper-division 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.

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Pre-law, Premedicine and Other Preprofessional Programs

Students planning to enter a professional school should visit with their advisors 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.

**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 the Catalog.

**Credit By Exam**

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 business, the arts and sciences and education.

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. Credit will be awarded to students who have taken Higher Level courses through the International Baccalaureate Program and scored at least a 4 (on a seven point scale) on the Higher Level course examination. This credit will be awarded on a course-by-course basis.

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

Academic departments on campus at OSU may offer advanced standing examinations in subject areas not offered by the CLEP, PEP or AP. Any currently enrolled student whose travel, employment, extensive readings or educational experience appear to have given the student proficiency in a subject that is offered at OSU, equivalent to the proficiency ordinarily expected of those students who take the subject in a regular class, may apply for an examination on the subject.

A student who has earned credit in a course which OSU refused to accept, because the institution at which the course was taken was not accredited, may apply for a validation examination. The dean of the college in which the course is offered appoints a committee of three to construct, administer and evaluate the examination.

Information pertaining to these examinations may be obtained from the Office of Admissions. See also the "Academic Regulations" section of the Catalog.

**Oklahoma State University-Kyoto**

Oklahoma State University-Kyoto (OSU-K) offers a two-year curriculum of General Education courses, on the campus located in Kameoka, Japan, to all students-Japanese, American, or other nationalities-who may then complete their baccalaureate degrees on the main campus in Stillwater. Kameoka is a suburb of Kyoto, a city of 1.5 million and site of the ancient capital of Japan. Kameoka is in the Kyoto Prefecture which is the equivalent of a U.S. state. Since 1984, Kameoka has had a sister-city relationship with Stillwater, and Kyoto has maintained a sister-state relationship with Oklahoma. In 1987, Kameoka officials asked OSU to establish an educational program which would benefit students from both nations. For additional information contact the Office of Admissions or the Office of International Programs.

**National Student Exchange**

National Student Exchange is a program designed to provide the opportunity for OSU students to attend over 120 other colleges and universities in the United States or utilize their study abroad programs to attend other institutions throughout the world without paying the high cost of out-of-state tuition. It also allows students from other member colleges and universities to attend OSU, at an in-state tuition rate. For additional information contact the coordinator of special programs, Office of the Vice-President for Student Services, 201 Whitehurst.

**Oklahoma Scholar-Leadership Enrichment Program**

The Oklahoma Scholar-Leadership Enrichment Program (OSLEP) is a statewide academic program designed to develop scholarship and leadership abilities of outstanding students. Students study in intensive, five-day seminars with a distinguished scholar and are selected from Oklahoma's 21 four-year colleges and universities. OSU's upper-division and graduate students with a 3.00 GPA are eligible to apply. Freshmen and sophomores who have demonstrated exceptional academic achievement are also considered. OSLEP seminars carry two hours of credit, and the only cost to students is the tuition for two credit hours and a transcript fee. The seminars are graded on a satisfactory/unsatisfactory basis and is transferred to OSU as Pass/Fail. Application should be
made as early in the academic year as possible. Further information and application materials may be obtained from OSU's OSLEP coordinator, University Honors Program, 509 Edmon Low Library.

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 assistant director, Residential Life, Kerr Drummond.

Study Abroad
Students at OSU are encouraged to broaden their education by adding an international dimension through study abroad. Students may earn OSU credit at OSU-Kyoto in Japan, through reciprocal exchange programs or by participation in international programs offered by OSU extension. Students may earn transfer credit while studying in many other countries such as China, England, France, Germany, Japan, Mexico, Russia and Spain. Work abroad programs are also available.

OSU offers outstanding undergraduate and graduate students the opportunity to apply for the Bailey Trust Memorial Scholarship for study abroad in the liberal arts. National scholarships for study in foreign countries are available.

Students interested in information on study or work abroad or in scholarships for study abroad should inquire at the Arts and Sciences Student Academic Services office, 202 Life Sciences East.

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. The UCT Board of Trustees exercises governmental control of the Center, contracts with participating universities for courses and degree programs, and provides state-appropriated funds for delivery of those programs.

Programs of study are offered by four participating universities—Oklahoma State University, Langston, Northeastern State, and the University of Oklahoma. The four universities are not permitted to duplicate programs. Oklahoma State University is approved to offer courses leading to 18 graduate degrees, three certification programs and three undergraduate degrees.

Faculty from the participating universities provide instruction. UCT is not authorized to hire its own faculty. 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 are treated as residence credit at the university teaching the course. Courses taken at UCT that are offered by Langston, Northeastern State, 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 the Catalog.

Students wishing to take courses at UCT enroll and pay tuition and fees at the Center. Tuition and fee rates for courses offered at UCT are set by the Oklahoma State Regents for Higher Education and are published in the UCT class schedule each semester.

Admission requirements for students seeking admission to programs offered by Oklahoma State University through the University Center at Tulsa are the same as if they were pursuing the degree program on the Stillwater campus. Students pursuing a degree from OSU through UCT are also eligible to apply for financial aid.

Degrees are granted by each of the participating universities. UCT is not authorized to grant degrees under its own auspices. Graduates may participate in their home university's graduation ceremonies or in a commencement program sponsored by UCT and held in Tulsa.

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. In most colleges, freshmen and undeclared students are advised through the college's office of student academic services, while students who have declared majors are advised by an adviser in their major department.

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

The locations of the offices of student academic services are:

- Agricultural Sciences and Natural Resources-136 Agricultural Hall
- Arts and Sciences-202 Life Science East
- Business-201 L Business Building
- Human Environmental Sciences-114 Human Environmental Sciences
- University Academic Services-201 M Whitehurst Hall

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

University Academic Services
The Office of University Academic Services (UAS) is responsible for providing academic advisement and other related academic services to students who are admitted provisionally to OSU through the Alternative Admission and Adult Admission programs. The Alternative Admission Program allows approximately eight percent of OSU's entering freshman class to be admitted without meeting all of the normal criteria for admission; the Adult Admission Program allows students who are 21 and older and those on active military duty full
access to the University, provided they have never completed prior college work.

Students who enroll through UAS are assigned to advisers who monitor remediation of curricular deficiencies and progress toward meeting the University's General Education requirements. Advisers also help clarify University policies and assist students in exploring career goals. UAS advisers are knowledgeable about the degree programs in all six undergraduate academic colleges, and one primary goal of UAS is to provide personal attention and assistance to students as they develop successful study habits and explore the various academic options available to them at OSU.

Student Academic Mentor Program. The Student Academic Mentor (SAM) Program pairs each new freshman, transfer and adult student with an upper class student in an effort to ease the transition to OSU. These "SAMS" are carefully selected among continuing students at OSU to work with new students individually and in small groups through their freshman orientation classes to help them feel welcome and to assimilate into campus life.

University Academic Assessment Program. UAS also provides academic advising and counseling to students enrolled in the University Academic Assessment Program (UAAP). This program is designed for transfer students who are admitted on probation and OSU students who have experienced academic difficulty, many of whom are on probation or have been readmitted after suspension. UAAP gives students an opportunity to re-evaluate their career and educational goals in an attempt to develop a realistic and successful educational plan. In addition to meeting minimum grade-point averages required by the Oklahoma State Regents for Higher Education, students must enroll in and complete the course Academic Assessment and Evaluation. This course is designed to help students identify their reasons for experiencing academic difficulty and determine ways to overcome their academic weaknesses. It also assists students in exploring various career and educational alternatives.

In addition to the teaching, academic advising and counseling functions of UAS, the office serves as a central information 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 that 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.

University Assessment Program

The University Assessment Program at OSU provides public assurance of program quality and accountability, and data for periodic reports documenting progress toward meeting instructional, institutional and programmatic objectives. The University Assessment Council consisting of 15 faculty, staff and student members developed the following philosophy:

1. Determine student readiness based on multiple indicators including past academic performance, educational readiness, educational goals, study skills, self-concepts and motivation.
2. Ascertain student academic progress and learning competencies.
3. Ascertain student achievement of program goals and objectives.
4. Determine student satisfaction with academic and support services, curriculum, faculty and personnel.
5. Provide information to enhance academic and student service program design, development and management.
6. Evaluate results of the assessment information collection, feedback and integration process.

On July 1, 1994 the Office of University Assessment was created as an administrative unit. This office pursues the University Assessment Council philosophy by administering the two programs of assessment and tracking.

The program of assessment has four initiatives:

1. entry level, composed of Entry Level Placement Analysis, Compass Test, ACT, SAT, high school GPA, and others.
2. mid level, composed of departmental and university-wide measures of student achievement.
3. outcomes, composed of departmental measures of student achievement.
4. satisfaction, composed of the Student Satisfaction Survey.

The program of tracking has four functions:

1. following each student cohort.
2. providing an early warning system of student difficulties.
3. integrating assessment data into longitudinal profiles of individual students.
4. providing feedback to the institution.

The OSU Office of University Assessment submits a yearly report to the Oklahoma State Regents for Higher Education that summarizes the activities conducted at OSU in the above areas. Each activity is also reported separately with information regarding objectives or outcomes, methods used, student population involved, and faculty involved.

Computing and Information Services

Computing and Information Services (CIS), provides computing services to all areas of the university in support of the University's instructional, research and administrative functions. CIS provides training, user counseling, and help on all computer-related topics including diagnostics, purchasing and communications. Additionally, CIS installs and supports microcomputers and Novell Networks.

CIS provides a public microcomputer lab in the Classroom Building, in the Student Union, and in the Poultry Building, with Apple Macintosh and IBM microcomputers, dot matrix printers, and laser printer services. The labs have extended hours to allow faculty, students and staff easy access to the computers. The CIS also operates, in conjunction with the College of Business Administration, a public lab in 002 Business. These labs are equipped with a variety of popular software packages for word processing, statistical analysis, terminal emulation, databases, spreadsheets, and programming. Users may also bring their own software to use in the lab.

Students and faculty can access the mainframe systems through dial-up (modem) access or through remote terminal clusters and printers, located in 009
Business, 113 Engineering South, 108 Math Science, and Iba, Stout and Wentz Residence Halls.

CIS offers help through electronic mail, telephone, appointment, or personal visits to the Help Desk, located in 113 Math Science. (The E-mail address is helpdesk osuvmi.bitnet or helpdesk vml.ucc.okstate.edu.) Other services available through the Help Desk include laser printing services for both Intel-based and Macintosh computers.

CIS publishes a User's Manual as well as a bi-monthly Newsletter to keep all OSU computer users informed about UCC systems and other computer-related issues.

CIS supports several data communication networks linking terminals and host computers across the campus, the nation and the world. CIS, a charter member of MIDnet and ONENET, provides host computers across the campus, the nation and the world. CIS, a charter member of MIDnet and ONENET, provides access to the Internet, BITNET and other networks. Through these networks, researchers and scientists can communicate with computers worldwide.

The mainframe computer at CIS is an IBM 3090-200S with Vector Facility, operating MVS/ESA and VM/ESA. Two timesharing systems, TSO and CMS, are available on the IBM. CIS also has a VAX VMS cluster, consisting of three VAXStation 3100 Computers and a VAX6340. Additionally, there are two DEC 5000-240 systems with the ULTRIX operating system, one for instructional use and one for researchers.

For more information about CIS, contact the main office, located in 113 Math Science.

The Center for Family Services

The Center for Family Services is open to any individual, couple or family that desires help with relationship issues, including marital concerns, parent-child relationships, or other family issues. Fees are determined on a sliding fee scale based on income and family size. Scholarships ranging from $2.00 - $45.00 per session are awarded to those with family incomes less than $36,000. No one will be denied services because of inability to pay.

Appointments are available on request. While appointments are available during both day time and evening hours, most appointments are scheduled on Wednesday and Thursday evenings. When an individual contacts the Center to seek marital and family therapy services, a staff member will ask a few questions about the family and the reasons for seeking the services, in order to assign the most appropriate therapist. Usually within 24 hours, an initial appointment will be scheduled. If time allows, an information packet will be sent before the first appointment.

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 40-station, networked, microcomputer lab, a 10-station video lab, and a tutoring room. Instructional software and several programming languages are available, as well as a library of video cassettes that contain lessons on almost all levels of mathematics courses through calculus and differential equations.

Undergraduate students majoring in mathematics are available in the Center to tutor students and to assist students in the use of the equipment.

University Placement

University Placement assists OSU students and alumni in the colleges of Arts and Sciences, Business Administration, Education, and Human Environmental Sciences, with job search activities related to internships, part-time employment while attending college, and full-time professional employment following graduation. Placement services for students and alumni in the colleges of Agricultural Sciences and Natural Resources, and Engineering, Architecture and Technology are coordinated by their respective student academic services offices.

Services include facilitating the campus interview program, providing job vacancy information to registrants, responding to employers' requests for referral of qualified job applicants, assisting with resume and interview preparation, sending placement credentials to employers, and developing relationships with employers to promote opportunities for employment of OSU students and graduates, including internships and part-time employment opportunities.

Special events sponsored by University Placement to provide opportunities for interaction between registrants and employers include Graduate/Professional School Information Day, Arkansas/Oklahoma Job Fair, Internship Day, Mock Interviews, Minority Career Day, MBA Job Fair, University Career Day, Summer Employment Placement Day, and Teacher Placement Days.

Psychological Services Center

The Psychological Services Center was established in 1971 as a training, service and research facility at Oklahoma State University. It is operated by the Department of Psychology through the College of Arts and Sciences, and the Department of Applied Behavioral Studies, through the College of Education. It is located in 118 North Murray on the OSU campus. The building is accessible to the handicapped.

Services are provided to children, adolescents and adults and are available to 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 but not limited to: individual, group, family, and marital therapy; parent counseling and training; play therapy for children; treatment of phobias and anxiety disorders; biofeedback; relaxation training; assertiveness training; stress management; depression; intellectual, personality, and neuropsychological assessment; and school consultation.

The Center's staff includes master's, doctoral, and postdoctoral students in the clinical and counseling psychology training programs, that are accredited by the American Psychological Association. The staff also includes supervising clinical counseling and developmental psychologists from the departments of Psychology and Applied Behavioral Studies. 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 structure ranging from $5 to $50 per session, depending on one's financial situation.
The Center is open from 8:00 a.m. until noon and 1:00 p.m. until 10:00 p.m. Monday, Tuesday and Thursday. On Wednesday and Friday, it is open from 8:00 a.m. until noon and 1:00 p.m. until 5:00 p.m. Appointments can be made by contacting the Center.

Special Facilities

Bartlett Center for the Studio Arts and the Gardiner Art Gallery

Old Gardiner Hall, as the Bartlett Center was formerly known, was built in 1910 as a women’s residence hall and has served also as a classroom building for women’s physical education, speech, agriculture extension and the College of Business. The building was named to recognize Maude Gardiner, founder of the University’s home economics program. Gardiner Hall was renamed the Bartlett Center when Mr. and Mrs. F. M. “Pete” Bartlett gave Oklahoma State University a generous gift designated for the renovation of the hall.

The Bartlett Center has greatly enhanced the image of the visual arts at OSU. The Center provides activities which have brought regional and national 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, Department of Art 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, Lucas Sama-ras, and traveling exhibitions such as “American Works on Paper: 100 years of American Art,” and “Watercolor U.S.A.” Since 1987, the Gallery has hosted a biennial juried show, “The Cimarron National Works on Paper.” Faculty and student work is also exhibited on a regular basis.

Bartlett Independent Living Laboratory

The F.M. "Pete" Bartlett family, with a dream of independent living for all, funded a gift to renovate a residential structure on campus. This dream of a research and demonstration laboratory illustrates universal design, that is, "design for the life span of all people regardless of age, sex, ability or change in ability."

The laboratory currently serves as a day treatment facility in a cooperative project with Willow View, a mental health facility. Students may conduct case study research related to functionality of the design features, specialized technology, and code standards for accessibility. The special features of the laboratory include computerized environmental control systems, motorized windows, blinds, and draperies; adjustable-height work centers and other devices related to everyday functioning.

Research in progress allows the numerous visitors to the laboratory to assess attitudes, knowledge, and functionality of "Independence Hall." This provides a base of knowledge for builders, architects, interior designers, and other professionals who work with clients experiencing life span changes.

Colvin Center

The Colvin Center, one of the finest facilities in the nation, encompasses a wide variety of organized and informal recreation activities for all University students. Campus recreation programs include 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, basketball, volleyball, badminton, squash and indoor climbing wall. Over 50 intramural activities 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 a challenge course, sailing, canoeing and crew. Additional information about recreation programs may be found in the "Student Life" section.

Oklahoma Museum of Higher Education-Old Central

Old Central, the oldest building on campus, is on the National Register of Historic Places and it is operated by the Oklahoma Historical Society as a museum. The building was dedicated June 15, 1894, and classes were held there beginning September 12, 1894 with 144 students and a faculty of eight. Centennial observances begin June 15, 1994 and continue through the Fall 1994 Semester. The building has exhibits relating to OSU’s early history, and some rooms have been recreated as they would have looked in 1894.

Information and exhibit materials are collected from other state higher education institutions to offer a comprehensive history of higher education for the entire state. Permanent exhibits trace Oklahoma’s general educational progress from territorial days to the present. Rotating displays feature specific institutions and related educational subjects.

The museum is generally open to the public Tuesday-Friday, 9:00 a.m.-5:00 p.m., and Saturday 10:00 a.m.-4:00 p.m.; visitors may wish to call before coming by. It is closed Sunday, Monday and legal holidays. A minimal admission fee is charged. Special tours and slide presentations are available for groups by appointment. Groups may also rent areas of the building, such as the Assembly Hall. Reservation agreements are available at the Museum, or by calling (405) 624-3220.

Edmon Low Library

Conveniently situated in the center of the campus, and open 102 hours each week when classes are in session, the Edmon Low Library contains more than 5.5 million books, documents and microforms, and 16,000 serials that support the diverse academic and research programs of the University. The collections are arranged in broad subject divisions based upon the Dewey Decimal Classification system. Librarians at three reference desks-General Reference, Science and Engineering, and Government Documents-provide assistance to students and faculty. Most books and periodicals are shelved in open stacks available to all students and faculty.
PETE, the Library's computerized information system, enables students and faculty to search the OSU Library Catalog and several bibliographic databases using workstations in the Library or by remote access. The OSU Library Catalog contains records for all library books as well as a significant number of government documents. It also indicates which journals and magazines are owned by the Library.

Other PETE Databases—Periodical Abstracts, Newspaper Abstracts, and ABI/INFORM-index articles in magazines, journals and newspapers. These databases contain short summaries of the articles. ISI’s Current Contents databases index the most recent articles appearing in 6,200 significant research journals. Additional bibliographic databases are available through PETE.

Other commercial indexing databases are available through the Library's CD-NET. Terminals located near the reference desks may be used to search 20 additional bibliographic databases on a wide variety of subjects. All PETE and CD-NET terminals are equipped with printers so search results may be printed.

Interlibrary Services. Books or copies of articles that the Library does not own are obtained from other libraries through the Interlibrary Service office located on the first floor, southwest.

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 all subjects. The documents area is a regional depository for 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) Office. The Library was designated as a U.S. Patent Depository in 1956. As a depository the Library has access to the CASSIS database and receives the Official Gazette as well as a microfilm copy of every patent issued by the U.S. Patent and Trademark Office. The Library's patent collection is part of its Patent and Economic Development Office located in room 206 of the Center for International Trade Development. Search assistance for CASSIS is provided by appointment. Most searches take between four and eight hours to complete.

Maps. The Map Room houses one of the largest and most comprehensive collections of maps in the state. This collection contains more than 140,000 maps, as well as aerial photographs of Oklahoma and most metropolitan areas in North America. 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. A fast-growing collection is the MPSI urban aerial photographs. This collection consists of high-quality, large-scale aerial photographs of urban areas throughout North America, dating from 1980.

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, and Western Americana, as well as video cassettes, slide/tape programs, and taped lectures.

Special Collections and University Archives. The Library's Special Collections consist of rare books, photographs, selected material on Oklahoma history, and several manuscript collections. The collecting focus is on Oklahoma politics and rural development, 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 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 Finnell, Fly, and McBride Collections on soil conservation and water resources. The University Archives house official records and other material depicting the development of Oklahoma State University. This area is located at the east end of the second floor and is open from 8:00 a.m. to 5:00 p.m. on Monday through Friday. Material in these collections must be used in the adjacent reading room.

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 departments of Music and Theater. 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 an excellent atmosphere in Oklahoma for the teaching of the fine arts.

Student Union

The primary purpose of the Oklahoma State University Student Union is to serve the members of the University community through an organization that 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, the Bookstore, a variety of lounges, a theater, extensive food services, a shopping mall, a recreation center, 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 OSU student organizations and faculty meetings, normally at no charge.

Although the OSU Student Union’s annual budget exceeds 11 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 and live two-way presentations via compressed video fiber optic lines. 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 taped programs per year consisting of video teleconferences, educational programs, documentaries, video training tapes, and public service announcements for the University, state agencies and for state and federal grants.

ETS employs a full-time staff of 35 in the areas of production, engineering and art. Each of these areas is also staffed with students working to earn practical experience under the guidance of professionals. For those students who meet the prerequisites, who are conscientious and who are willing to work, there are three methods of entry into employment at ETS. One method is through an internship which allows the student to earn college credit. Another method is through part-time employment at ETS, usually reserved for those students who have completed an internship, and the third is through the University’s work-study program.

Wellness Center
The OU Wellness Center offers a variety of health-related programs for all OSU students. These programs include free wellness screening (cholesterol, blood pressure, body composition, and computerized health risk appraisal), wellness education classes, certification of aerobics and weight training instructors, and campus-wide health promotion activities.

The Wellness Center offers opportunities to undergraduate and graduate students to participate in practicum and internship programs in the disciplines of computer science, counseling and psychology, exercise science, health education, marketing, nutrition, pre-physical therapy, and wellness.

The Wellness Center houses a 140-seat theater, demonstration kitchen and dining room, aerobics area, weight room, computer lab, resource center and a full-service wellness laboratory. These rooms are available to OSU student groups for OSU-sponsored events, in cooperation with the Wellness Center.

Student Life

Allied Arts
Allied Arts, a unit of the Office of Student Activities, is responsible for presenting professional, touring, live performing arts events for the university community. Selection of these events is the function of a committee composed of students, faculty, staff and representatives from the local community. Events are selected from a broad range of performing arts, and include orchestras and choral groups, chamber ensembles, theatrical productions, mime, jazz, opera, ballet and dance, international and traditional ethnic performing arts, and vocal and instrumental soloists. The goal of the Allied Arts program is to provide the university community with the opportunity to experience quality, live performing arts in the university setting. Each academic year Allied Arts presents five to six performances, and persons attending do so either through the purchase of a season subscription or by purchasing individual tickets to specific events. OSU students can attend with either a student-discount season subscription or reduced-price individual tickets to specific events.

Allied Arts is the oldest continuously functioning university-related performing arts series in the state and has maintained a tradition of quality and variety in its presentations for more than 70 years.

Campus Recreation
Campus recreation programs are designed to provide equipment, space and professional assistance in helping University students, 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. Instructional programs for adults include noon fitness, evening fitness, karate, tennis, racquetball, swimming, scuba, lifeguarding, water exercises, aerobic dance, weight training, and country western dance. Instructional programs for dependents include swimming and karate. Free children’s activity programs are offered Saturday mornings each semester.

Intramurals. The intramural 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 (45 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, Rugby, Sailing, Scuba, Soccer, Snow Skiing, Volleyball, Waterskiing, Weightlifting, Wheelchair Sports 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, and the 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. The purpose of the challenge course is team building and self-esteem development.

Rental and purchase of quality outdoor equipment is available in the Colvin Center.

Greek Life
Marion Morgan, Manager, Greek Life
Darin Behara, Coordinator, Greek Life Programs
Karen Smith Woods, Program Assistant

The fraternity and sorority system is and has been a viable part of Oklahoma State University since 1917. There are approximately 2500 students who are members of the 25 national fraternities for men and 13 national sororities for women. The majority of these Greek letter organizations own their own houses which are considered by the OSU Board of Regents as University-recognized housing. The primary thrust of the Greek system is to enhance and promote brotherhood/sisterhood, academic achievement, leadership and social awareness. Fraternities conduct informal rush by contacting potential members during the spring and summer months. Sororities conduct formal rush, traditionally held in August, followed by informal rush periods in the fall and spring semesters. For additional information on the Greek system or how to apply for rush, write to the Department of Greek Life, 050 Student Union, OSU, Stillwater, Oklahoma, 74078.

Honor and Service Organizations
OSU offers opportunities for personal and professional development through many nationally-affiliated honor and service organizations. These organizations provide opportunities for leadership and program development, new friendships and recognition of achievement. University-wide organizations include:

- Blue Key (junior and senior honor society)
- Golden Key (junior and senior honor society)
- Mortar Board (junior and senior honor society)
- Order of Omega (honor society for sorority and fraternity members)
- Phi Eta Sigma (freshman and sophomore honor society)
- Phi Kappa Phi (national honor society for seniors and graduate students)

See college sections for organizations within each college.

Lectures

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

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

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

Religious Life

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

Residence Hall Organizations

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 system of representative government. There are numerous opportunities for involvement in the hall, such as floor officer, social committees, food committee, and sports and athletic activities.
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.

Alumni Programs and Services

The Alumni Association serves as a liaison between OSU and its former students, and provides members immediate and direct contact with the University. The mission of the OSU Alumni Association is to serve its members and alumni and to support and serve the needs of Oklahoma State University, its students, faculty, staff and friends.

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

The OSU Alumni Association is governed by a board of directors. Alumni programs are directed by an executive director, five program directors, and a student program coordinator.

OSU Foundation

The OSU Foundation was created in 1961 with the basic mission of finding private donors who were interested in providing additional scholarships for the best minds and finest leaders Oklahoma's high schools had to offer. The OSU Foundation is the only agency designated to solicit, receive and administer all private gifts on behalf of OSU. Although it is a separate corporation, the OSU Foundation maintains a close and cooperative working relationship with the University.

The mission of the OSU Foundation is to encourage the commitment of personal and financial resources from the private sector toward the priority objectives of Oklahoma State University, balancing the interests of the donor with the needs of the University, and to manage those resources efficiently and effectively. The Foundation exists to support Oklahoma State University in its mission to provide its students with exceptional academic experiences, to conduct scholarly research and other creative activities that advance fundamental knowledge, and to disseminate knowledge to the people of Oklahoma and the world.

OSU-Oklahoma City

James E. Hooper, Provost and Vice-President of Oklahoma State University
Jerrilee K. Mosier, Vice-Provost for Academic Affairs
Jerry Brooks, Vice-Provost for Fiscal Affairs
Mark Ames, Interim Vice-Provost for Student Affairs
Paul R. Dauphinais, Director of Admissions, Financial Aid, and Registrar

Having served the metropolitan area for more than three decades, Oklahoma State University-Oklahoma City (OSU-OKC) truly reflects the Oklahoma City Chamber of Commerce motto, "Growing With Pride." From its beginning in 1961 to today's thriving learning environment of more than 6,000 full-time, part-time and continuing education students, the Oklahoma City campus has become the institution most directly related to the education of professional technicians in the United States. OSU-OKC offers college courses leading to an associate degree, preparing the student in two years for employment in various career fields, as well as providing credits that are transferable to bachelor's degree programs and general education courses.

Accredited by the North Central Association of Colleges and Schools, OSU-OKC offers two-year programs leading to associate of science degrees in three areas: fire protection, horticulture and police science and to associate of applied science degrees in the following areas: accounting, architecture, avionics, civil, computer programming, construction, electronics, environmental systems, energy/environmental resources management, equine racing, general engineering, industrial drafting and design, industrial loss prevention, instrumentation, interpreter training, management, nurse science, surveying and technical communication technologies.

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

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 students' interests and aid them in the further development of their abilities.

Oklahoma State University-Oklahoma City is located at the crossroads of Oklahoma City, Interstate 44 and Interstate 40, at 900 North Portland, Oklahoma City, Oklahoma, 73107.

OSU-Okmulgee

Robert Klabenes, Provost and Vice-President of Oklahoma State University
Linda Avant, Assistant Provost
Thomas Dooley, Vice-Provost
Larry Williams, Executive Vice-Provost

Oklahoma State University-Okmulgee offers post-secondary advancing technology programs of study that culminate in associate degrees. This branch campus is a residential one, noted for the quality of its facilities and equipment, as well as its benchmark quality of technological and academic education.

OSU-Okmulgee's core curriculum is as diverse and innovative as its student body. Individuals receive the comprehensive education required to prepare them as competitive members of a world-class workforce and to be contributing members of society.

OSU-Okmulgee is divided into 11 departments offering a total of 34 degrees and six diplomas in addition to the General Education department for students who are undecided about their majors. Included in the diversified instructional departments are the following fields of study: 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 post-secondary, college credit courses are unique in Oklahoma. The Okmulgee campus blends the best of emerging technologies, enhanced computer applications and general education to prepare students for rewarding careers in business and industry. The comprehensive higher education received by students at OSU-Okmulgee makes those students highly marketable. Graduates from the college usually go directly from graduation to a waiting job and a bright future in terms of potential advancement. Today, there are OSU-Okmulgee graduates with outstanding skills and professional ethics working in jobs in virtually every corner of the world. Their well-honed skills run the gamut from manual arts and computer wizardry to business and high technology. The educational experience at OSU-Okmulgee is "hands on" from the day the student enters college.

OSU-Okmulgee operates on a year-round, three semester basis. New semesters begin in early January, late April and late August, each lasting for 15 weeks. The academic programs offered each semester are complemented by contemporary facilities and state-of-the-art instructional equipment.

Today's OSU-Okmulgee graduates complete their programs of study with something no other college in the state of Oklahoma offers—a Graduate Performance Guarantee. This guarantee assures the student and first employer that the graduate will enter the workplace with a set of pre-determined skills and competencies. The Graduate Performance Guarantee from OSU-Okmulgee is a "win-win" situation for the student, the campus, business and industry. The Graduate Performance Guarantee is tangible evidence of the confidence in the quality of the comprehensive high technology education offered to students at OSU-Okmulgee.

Oklahoma State University-Okmulgee is located at 1801 E. 4th Street, Okmulgee, Oklahoma 74447-3901. The toll-free phone number at OSU-Okmulgee is 1-800-722-4471.
State Postsecondary Review Entity (SPRE)

Oklahoma Review Standards and Complaint Procedure

The Higher Education Act of 1965 as amended in 1992 created the State Postsecondary Review Entity (SPRE) to serve as a consumer protection mechanism. OSU has the responsibility to make the following information available to students and prospective students.

Oklahoma Review Standards:

1. An institution shall make available to students and prospective students catalogs, course descriptions, admission requirements, schedules of tuition and fees, student refund policy, policies regarding course cancelations, and the rules and other basic information and regulations of the institution related to students.

2. An institution shall provide evidence that the course program information provided to current and prospective students is both accurate and clear so that the students can make appropriate educational decisions.

3. An institution shall establish and publish one or more methods to evaluate a prospective student's potential to be able to complete successfully the educational program for which the student has applied. The method(s) shall be described in writing and appropriately applied to evaluate student applications.

4. An institution shall publish and consistently apply a satisfactory academic progress policy, and shall maintain adequate records to document students' progress.

5. An institution shall maintain official files on students and other records pertaining to students and publish and enforce a policy on satisfactory academic progress.

6. An institution shall demonstrate its compliance with required local, state, and federal ordinances or codes enforcing safety, health, fire, building and sanitation standards or regulations.

7. An institution shall maintain evidence that current financial, administrative and other resources are adequate to ensure satisfactory conduct of its eligible programs and achievement of its stated educational goals with respect to those programs.

8. An institution financially at risk shall demonstrate that it has a written plan describing the reasonable arrangements for the continued instruction of its students and to protect the academic and financial aid records of all present and past students.

9. An institution that provides vocational programs to prepare students for gainful employment shall ensure that tuition and fees are reasonable and not excessive with respect to what the student can earn after completing the program. The institution shall ensure that the length of the program is reasonable with respect to the skills a student requires that will prepare him or her to enter that career field.

10. An institution shall publish and make available to prospective students and enrolled students information about each of its occupational, vocational and professional programs that includes (a) relevant statistics about the labor market and job availability, and (b) the relationship of courses to specific occupations as well as information about the minimum courses required for certification and/or licensure.

11. An institution shall demonstrate that each educational program is of appropriate length for its specific field based on existing federal requirements, state standards, existing licensure requirements or accreditation standards. If such independent criteria do not exist, the program's length shall be compared to that of similar programs offered by other postsecondary educational institutions.

12. An institution shall demonstrate for each of its programs of 600 clock hours, that program length is sufficient and necessary to enable students to attain the levels of knowledge and skill specified in its objectives.

13. An institution shall not have an owner, chief executive officer, member of a governing board or shareholders (if applicable) who has been either (a) convicted of, or pled nolo contendre or guilty to, a crime involving the acquisition, use or expenditure of federal funds, or (b) judicially determined to have committed a fraud involving federal funds.

14. An institution shall establish, publish and consistently administer internal procedures for receiving, investigating and formally responding to student complaints concerning the management or conduct of eligible programs or the misleading advertisement or promotion of those programs.

15. Advertising, promotion or student recruitment practices conducted by or on behalf of an institution shall not be false, misleading or exaggerated. Information provided to prospective students shall be accurate with respect to admission policies, financial information, conditions and benefits.

16. An institution shall publish and administer fair and equitable refund policies that include procedures for official withdrawal. Institutions which comply with section 484B of the Higher Education Act of 1965 as amended and the relevant implementing regulations with regard to students who receive Title IV financial aid, shall be considered to have implemented a fair and equitable refund policy.

17. An institution shall demonstrate the success of its eligible programs by providing the following student outcome information:

a. The rates at which the institution's students withdraw, complete or graduate, and the degree to which students meet other educational goals, such as transfer to another institution, military service, and employment in occupations related to their field of study.

b. Where required for job entry, the rates at which the institutions' graduates pass licensure, certification or registration exams.

SPRE Complaint Procedure. If a student feels that OSU has failed to meet its responsibility with respect to one of the SPRE standards, a complaint can be filed in the Office of the Provost and Vice President for Academic Affairs, 101 Whitehurst, Stillwater, OK 74078.
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:

1. 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 or 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 I-A or I-B, it shall be the duty of the president (and he or she 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 ensure 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 be 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.

Student Rights and Responsibilities

By enrolling at OSU, students accept the responsibility for complying with all applicable laws and University policies, while retaining the rights guaranteed under the Constitution of the United States. OSU expects students to show respect for the rights of others and for lawful authority, to represent themselves truthfully and accurately at all times, to respect private and public property, to fulfill contractual obligations including those which are financially made with the University, and to take responsibility for their own actions and the actions of their guests.

In order to help ensure that students understand their rights and responsibilities, the OSU "Student Rights and Responsibilities Governing Student Behavior" policy statement codifies and clarifies major areas of student rights and responsibilities. The University makes this document available through the OSU Gopher, accessible through the University computer labs. Additionally, printed copies may be obtained by students on request in the offices of the Provost and Vice-President for Academic Affairs, the Vice-President for Student Services, the Associate Vice-President for Multicultural Affairs, Director of Affirmative Action, Student Conduct Office, University Residential Life, Student Activities, the Student Union Information Desk and the Edmon Low Library Reserve Desk.
Campus Security

Public Safety

Philosophy and Service

The Oklahoma State University Police Department is dedicated to enhancing the opportunity for students, faculty and staff to participate in the educational experience by providing a safe, protected and orderly environment. As a service organization, the department offers a full range of police resources, including area patrols, criminal investigations, crime prevention, facilities security analysis, event planning, and parking management and enforcement. In addition, members of the department serve on University and community committees, provide training and specialized presentations to campus organizations and living groups, participate in the design and installation of safety and traffic control devices, and act as special advisers to all campus departments and administration. The professional police men and women, full-time staff members, and part-time employees are all hand-picked to meet the high standards and multidimensional mission of a public safety department.

Even though the OSU Police's overall strength has been reduced, as a cost cutting measure, from thirty-one sworn police officers to the current total of twenty-five members, the demands for services have increased. The number of part-time employees has increased slightly, by using student employees to replace commissioned officers in those low-threat areas of parking enforcement, entrance assistance and selected security assignments.

Operational cuts and position losses have been compensated for by more efficient management of resources. Policies have been implemented that address conservation of equipment and supplies. A grant was used to computerize the department's records for statistic compilation, data analysis, and retrieval of information, aiding in the successful garnering of over three hundred thousand dollars in grants and awards from outside sources.

OSU Police and cadet officers provide a positive image to visitors and members of the campus community, whether it is providing directions, parking information, or just a friendly welcome. Officers represent the University as a group of caring and professional people, intent upon enhancing a friendly community atmosphere. Necessary enforcement includes using alternatives to arrest when reasonable, and full cooperation with administrative services and functions that have an impact on student conduct. Enforcement efforts are geared toward providing a safe community.

OSU Police participation in athletic and special event staging and planning ensures that all aspects of safety and security of participants are considered. OSU Police officers provide professional crowd control and traffic regulation before, during, and after such events. As first responders to emergency situations, OSU Police are often cited by citizens for decisiveness and professionalism.

Students and staff find the OSU Police willing to share statistics, insights, and experiences as a basis for class reports or vocational interest. OSU Police managers seek proactive means to avoid problems and situations, whether it is suggesting added security measures, providing insight on planned activities, or using investigative analysis to assign a deterrent force.

For the OSU Police, "service" is not just a word or a part of a catchy slogan, but a way of life. Even with reduced staffing, people programs, such as motorist assistance, money transportation, and emergency notification services, continue. OSU's blue phone system, promising campus citizens "immediate help from out of the blue," has been operating for fifteen years and is still being copied by other universities. Campus organizations needing reliable and professional-appearing drivers often arrange to use members of the student cadet force.

Operating under a 1989 grant from the Oklahoma Highway Safety Office, the OSU Police launched the program Campus Community Alcohol Safety Effort (C-CASE), aimed at promoting seatbelt use and educating citizens, primarily students, about the effects and penalties of alcohol use and abuse. A second positive effect of the C-CASE effort was the strict enforcement of alcohol-related laws, that has shown dramatic results in getting the drunk driver off campus streets and consequentially preventing accidents. This program continues in part, with emphasis on underage drinking.

Thousands of visitors, campers, fishermen, and sightseers visit Lake Carl Blackwell and surrounding recreational areas. OSU Police officers provide friendly and efficient police protection, including lake patrol and rescue operations on the water.

Overall, the OSU Police Department believes in providing proactive law enforcement and service to the University community.

Crime Awareness

Security, Prevention, Statistics, Intervention

Crime

It is an unfortunate fact that criminal incidents of all types occur on college campuses. Many campuses around the country investigate and make public the nature of crimes, the number, and how they are investigated. Oklahoma State University subscribes to that approach and further believes that the public should know how active the OSU Police are in crime prevention and detection.

Reporting Crimes

Crime victims, regardless how seemingly insignificant the crime, are encouraged to promptly report the incident to the OSU Police or the appropriate police agency. To report a crime, a victim or witness need only call the police phone number, and a police officer will meet the person to gather the information. An official report is made with copies available to the victim. Each day the incidents from the previous day, excluding names, are summarized and made available to the OSU president, key OSU staff, other law enforcement agencies, and the media. Each month the number of incidents in each category of crime are counted and reported to the Oklahoma State Bureau of Investigation, who in turn provides the information to the Federal Bureau of Investigation. Each year, the FBI publishes a book of crime statistics called Crime in the United States, that includes accurate accounting of the criminal incidents that occurred on the OSU campus. OSU has reported crime statistics in this manner since the FBI began publishing campus crime statistics in 1971.

Crimes in Progress

To report a crime in progress, a person, victim or witness, can dial 911 or use one of the outside blue emergency telephones, or call one of the police phone numbers. Either reporting method will stimulate the response of police, fire, ambulance, or other first responders. In addition, the victim of serious crimes can request support personnel, such as ministers, rape crisis or domestic violence counseling, during or after reporting.

Additionally, crime victims may be eligible for funds through victim compensation laws administered by the Office of the District Attorney.
Actual Crime at OSU

When comparing crime at OSU to other institutions of similar size, OSU’s crime rate is one of the lowest. In fact, OSU has fewer crimes occurring on campus than any other Big Eight university (7 years in a row).

The crime and arrest statistics reported are those which occurred within the jurisdictional boundaries of campus. They do not include “off campus” organizations or “off campus” private housing; these are within the city’s police jurisdiction. It is the responsibility of the Stillwater Police Department to monitor and record crime activities at “off campus” organizations or “off campus” private housing. Crime statistics concerning these locations or areas are available at the Stillwater Police Department.

Future

Although it is believed that the low incidence of crime will continue, this report is not intended to give a false sense of security. Crime will occur, but prevention efforts can be effective in reducing the opportunities for criminal activity. Citizens play a key role in crime prevention efforts by being cautious, careful, alert to personal safety and protective of personal and University possessions. The crime prevention tips noted below should be followed.

Security and Access Control

It is OSU’s policy to lock the doors of buildings that are not in use. However, when working or studying in buildings after normal working hours, it is suggested that individual offices be locked, based upon an assumption that unrestricted access to the building is possible. Some buildings on campus are rarely locked, at the department’s request, since students study and work on projects all hours of the day and night. Again, individual offices should be locked by the user on a presumption that the building is accessible. Residence halls have open access between the hours of 6 a.m. to midnight, Sunday through Thursday, and 6 a.m. to 2 a.m. on Friday and Saturday. During non-open access hours, all residence hall doors are locked except the front desk entrance. Instances of propped open doors have occurred, and residents are encouraged to take security precautions in the halls and rooms. Individual rooms should be locked at all times for safety.

Crime Prevention

OSU has experienced success at reducing and preventing crime. Some of

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<th>Actual Reported Part I Crimes At OSU</th>
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<td><strong>Year</strong></td>
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<td><strong>Part 1 Crimes</strong></td>
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<td>Criminal Homicide</td>
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<td>Forcible Rape</td>
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<td>Attempt to Rape</td>
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<td>Robbery</td>
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<td>Larceny</td>
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<td><strong>Other Sexual Offenses</strong></td>
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<td><strong>Total Stolen Property</strong></td>
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<td>Alcohol Violations Arrests</td>
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<td>Drug Violations Arrests</td>
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<td>Weapon Law Violation Arrests</td>
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<td>Adults (All Offenses)</td>
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<td>Juveniles (All Offenses)</td>
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<td><strong>Cases Cleared (Part 1)</strong></td>
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<td><strong>Clearance Rate</strong></td>
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Base Year 1993.
Larceny is reported here even though not required in the Crime Awareness Act of 1990.
In 1994, there were no Part I crimes that fell under the Hate Crimes Statistics Act.
the more notable efforts are:
Emergency telephone system (Blue Phones)
Emergency 911 dialing
24-hour preventive patrols
Campus foot patrol by uniformed officers
Burglar alarms in key areas
24-hour staff in Residence Halls
Custodial staff in academic buildings
Crime prevention seminar presentations to groups
Crime prevention pamphlets for students and employees
Monitoring of some parking lots by surveillance cameras
Crime stopper telephone line - 744-6063

In addition to preventing crime, considerable effort is devoted to crime intervention. All reported crimes are investigated immediately. Follow-up investigation occurs to identify the offenders. Where multiple incidents occur, surveillance techniques are implemented to help apprehend violators. When caught, offenders are processed through the county court system and OSU when appropriate.

Police Protection
The OSU campus is protected by a campus police agency consisting of 25 sworn officers, 10 support persons, and 14 part-time persons. The agency is operated and available 24 hours a day, 365 days a year. Authority of the sworn officers is derived from state statutes; these allow for full police powers on OSU property. In addition by agreement with the City of Stillwater, campus police and city police enjoy an excellent working relationship. All campus police officers undergo an extensive selection process and meet state-mandated training requirements.

Avoiding Victimization
Tips for personal safety and property security:
Be cautious of strangers.
Avoid getting into vulnerable no-exit places.
Do not hesitate to call police when confronted by unknown persons.
Keep house or residence hall room locked.
At night, walk in groups of at least two.
Walk with confidence, and avoid walking near bushes and parked cars.
Become familiar with the location of emergency (blue) telephones.

When parking, remove valuables from plain view and lock the vehicle.
Engrave valuables with driver's license number and record serial numbers.
Make copies of credit cards and lists of other valuables carried on person.
Write name and ID number in several places in textbooks.
Lock bicycle in a bicycle rack.
Report all incidents and losses to police immediately.

When serious crimes occur on or off campus that are considered to be a threat to the campus community, that information will be provided to faculty, staff and students. The medium for this information dissemination will be the campus newspaper, faculty/staff newsletters, or in special instances, specific notices to on-campus residences. Such notices may be posted on residence hall entrance doors, in residents' mailboxes, or placed on electronic voice mail.

Persons may dial the campus phone number 744-6063 and have voice mail access to crime tip information, crime update, crime prevention tips, and parking information.

Alcoholic Beverages and Other Drugs
As set forth in local, state and federal laws, and the rules and regulations of the University, Oklahoma State University prohibits the unlawful possession, use, or distribution of illicit drugs and alcohol by students and employees in buildings, facilities, grounds, or other property owned and/or controlled by the University or as part of University activities.

Under OSU regulations, no 3.2 beer or other alcoholic beverage is allowed in OSU housing, including fraternities and sororities, except for married student housing, regardless of age. Furthermore, under the same regulations, the possession/consumption of 3.2 beer or alcohol by those of legal age (over 21) is allowed only in certain designated, non-public places on the OSU campus, properties and facilities. For further explanation, see the pamphlet "OSU Dangers of Drugs and Alcohol Abuse."

Drug and alcohol laws are vigorously enforced on the OSU campus. Violators are subject to criminal prosecution in the District Court of Payne County. The enforcement techniques range from plain view violation to long-term undercover investigations by local, state, or federal agents and agencies.

University Counseling Services and the Employee Assistance Program have counseling and rehabilitation programs for students and employees, respectively. Should these programs not meet an individual's needs, there are other programs in the community or nearby that may be better suited. A number of such programs are listed in the "OSU Dangers of Drugs and Alcohol Abuse" pamphlet.

Sexual Assault

What To Do If Victimized
Oklahoma State University's prevention efforts in the area of sexual assault (including rape) involve the entire community. At the forefront is the Committee for Rape Prevention and Awareness, whose members are representatives from the OSU Police Department, Residential Life, University Counseling, OSU faculty, Greek Life, University Conduct Office, OSU Student Health Center, OSU Mental Health, PaNOK (students who are peer educators), and OSU staff personnel. The committee provides training programs, presentations, and workshops to any interested individuals or groups.

Program topics generally include stranger rape, date and acquaintance rape, rapist characteristics, rape trauma syndrome, and victim recovery. An increasing number of presentations, explaining the male's role in sexual assaults, are directed to all male audiences, such as fraternities and athletic teams.

Procedures to Follow
A victim of sexual assault should follow certain procedures and consider several options. These procedures and options are clearly outlined in the rape avoidance seminars mentioned previously and "Rape Prevention" pamphlets made available to the OSU community. These educational programs and pamphlets also outline techniques and strategies that help people recognize and avoid sexual assault threats.

Evidence. Preserving evidence is of paramount importance after a sexual assault. Victims should be careful not to bathe, douche, wash clothing, or tamper with other potential evidence after a sexual assault. The first inclination may be to do one or more of these; however, the temptation should be resisted. Evidence is critical in a criminal prosecution.

Contacting the Police Department
When a sexual assault is reported to the OSU Police Department or to the Stillwater Police Department, an officer is
Agreeing to have a Sexual Assault Examination. An officer or designee will take the victim to the Student Health Clinic or the Stillwater Medical Center to be examined by a physician. A complete physical examination will be given as well as treatment for any injuries. A friend or relative may be permitted to accompany the victim. In addition, the victim may be examined for the purpose of obtaining evidence, that would be necessary in court. Appropriate antibiotic therapy can be given to decrease the chances of developing venereal disease. After the examination at the hospital, the officer may bring the victim back to the police headquarters or another location to complete the interview. Again, a counselor is encouraged to be present.

The victim of a rape is not responsible for legal or medical expenses. The case will be prosecuted by the Office of the District Attorney. The victim will only have to contribute time. The OSU Police Department furnishes a sexual assault examination kit to the OSU Student Health Clinic and the Stillwater Medical Center at no cost to the victim.

Police Investigation. Later, at police headquarters, the victim will be asked to be more specific about the events of the attack. A person of the victim’s choosing may accompany the victim during this period. This questioning is done to help the investigation and to help arrange the events firmly in mind. The victim’s comments will probably be tape recorded for future reference. This will make testifying in court much easier and less frightening. It will be handled considerately and courteously. Only the investigating officer will ask questions. Based on conversations with the officer, the victim can then decide whether or not to file charges. (Threats or harassment of a rape victim after charges have been filed are rare). When finished at police headquarters, the victim can go to a place of their choice. OSU and Stillwater Police officers have been trained to deal with sexual assault victims. However, if the victim should feel uncomfortable speaking to a male officer, every effort will be made to notify a female officer, female counselor, or female volunteer.

A rape or sexual assault may be reported to the hall director, a university counselor, or health worker at the Student Health Center. Charges do not have to be filed against the attacker if a rape is reported. However, it is wise to give information to the police anyway. The information and suspect description may help locate a suspect in other offenses and possibly prevent another person from becoming the victim of a rape. The police will not know that there is a rapist on campus unless they are told. The police will not pressure the victim to file charges.

Victims of sexual assault can elect to have personal information eliminated from police reports.

Support Services

University Conduct Office. If the victim does not want the case to be addressed through the criminal justice system, another alternative is available. Cases involving students who are accused of non-academic misconduct might be assigned to the Office of Student Conduct. Persons found guilty of sexual assault, forcible or non-forcible, could be placed on probation or suspended from OSU. Both the accuser and the accused are entitled to the same opportunities to have others present during a campus disciplinary hearing, and both are entitled to be informed of the outcome of any disciplinary proceeding. Further information can be obtained by contacting the Office of Student Conduct at 744-5470. Also, a copy of the "Student's Rights and Responsibilities" can be obtained at various locations on campus.

Role of Housing. The hall directors and resident assistants who work in the residence halls continually attend sexual assault training programs, and learn how to respond to a student who has been victimized by a sexual or physical attack. They have been informed about the resources available; in fact, some have been trained to conduct sexual assault presentations and workshops. A victim of a sexual assault may request assistance from the University administration in changing academic and/or living situations where a continued threat may be reasonably assumed.

Role of Counseling Services. The OSU Student Health Center and University Counseling Services provide individual and group counseling services for those victimized by sexual or physical assault.
University Academic Regulations

Contents-Academic Regulations

1. Admission-Withdrawal
   1.1 Admission of Freshmen
   1.2 Admission of Transfer Students
   1.3 Admission to Certain Professional Programs
   1.4 International Student English Proficiency Requirement
   1.5 Satisfactory Academic Progress
   1.6 Scholastic Requirements for Student under Academic Probation in an Undergraduate College
   1.7 Academic Suspension
   1.8 Reinstatement after Academic Suspension
   1.9 Readmission
   1.10 Withdrawing from the University

2. Student Status
   2.1 Classification of Students
   2.2 Full-time Students
   2.3 Part-time Students
   2.4 Special Students

3. Requirements
   3.1 Date of Matriculation
   3.2 Changes in Degree Requirements
   3.3 Honors Programs
   3.4 General Education Requirements
   3.5 English Composition Requirement
   3.6 English Proficiency Examination
   3.7 Substitution of Required Courses
   3.8 Waiving of Required Courses
   3.9 Changing Majors
   3.10 Deadline for Completion of Requirements
   3.11 Second Baccalaureate Degree

4. Credits
   4.1 Residence Credit
   4.2 Extension and Correspondence Credit
   4.3 Transfer Credit from Other Accredited Four-year Institutions
   4.4 Transfer Credit from Junior Colleges
   4.5 Transfer Students with Less Than a "C" Grade-point Average
   4.6 Credit by Exam
   4.7 Validation Examination Credit
   4.8 Graduate Credit Hours for a Senior
   4.9 Semester Credit Hour
   4.10 Foreign Language Credit for Native Speakers

5. Enrollment
   5.1 Course Numbering System
   5.2 Maximum Semester Credit Hour Load
   5.3 Adding Courses
   5.4 Dropping Courses
   5.5 Concurrent Enrollment
   5.6 Prerequisites to Upper-division and Graduate-division Courses
   5.7 Class Enrollment Maxima
   5.8 Priority Enrollment
   5.9 Late Enrollment
   5.10 Payment of Tuition and Fees
   5.11 Audit
   5.12 Minimum Class Size

6. Grades and Grading
   6.1 Official Transcripts
   6.2 Grade Interpretation
   6.3 Grade-point System
   6.4 Grade-point Average Calculating
   6.5 Freshman Progress Reports
   6.6 Pass-No Pass Grading System
   6.7 Pass-Fail Grading System
   6.8 Grade Reports
   6.9 Correcting Grades Reported in Error
   6.10 Grade Appeals
   6.11 Honor Roll
   6.12 Academic Dishonesty or Misconduct
   6.13 Academic Forgiveness

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

   In addition to these minimal regulations, there may be additional college, department or program requirements which apply. Students are advised to review all steps of their academic progress with their academic 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 pro-
average of 2.00 or the semester GPA of 2.00, may enroll, at the discretion of the institution, in an additional 15 semester hours in a further attempt to achieve the requirements for retention. Such students will be afforded this extension one time only.

Part-time student status must be determined prior to the last day of the second week of classes. Students who are part-time must have a 2.00 semester GPA in order to continue. Full-time probation students who drop below 12 hours (six hours in a summer session), without prior approval, after the last day of the second week of classes, will be academically suspended. Such students will have the same right of appeal as other suspended students. However, if reinstatement is granted to a student in this category with a semester GPA of 2.00 or higher, academic suspension will not be noted on the student’s transcript. If dropping below full-time status during the semester becomes necessary, students should contact their student academic services directors regarding procedures.

A student enrolling on probation should seek help from an academic adviser and a counselor in the University Counseling Services when deciding on an academic load and extracurricular activities. A student whose poor grades may have been caused by health problems should seek the help of a physician.

1.7 Academic Suspension. A student on probation will be suspended when he or she earns a semester GPA of less than a 2.00 in a minimum of 12 hours of regularly-graded course work not including activity, performance or remedial courses, and the retention grade-point average for all hours attempted falls below the following:

<table>
<thead>
<tr>
<th>Total hours attempted</th>
<th>Minimum retention grade-point average required</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 through 30</td>
<td>1.70</td>
</tr>
<tr>
<td>31 or more</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Freshman students, 30 or fewer credit hours, with a retention GPA of 1.70 to less than 2.00 will be placed on academic notice. These students should remain in contact with their student academic service offices regarding special academic support services and procedures.

All courses in which a student has a recorded grade will be counted in the calculation of the grade-point average for retention purposes excluding any courses repeated or reprieved and excluding remedial courses and physical education activity courses. (See “Academic Forgiveness.”)

A senior, with 90 or more hours in a specified degree program, who has failed to meet the retention grade-point average of 2.00 or the semester GPA of 2.00, may enroll, at the discretion of the institution, in an additional 15 semester hours in a further attempt to achieve the requirements for retention. Such students will be afforded this extension one time only.

Part-time student status must be determined prior to the last day of the second week of classes. Students who are part-time must have a 2.00 semester GPA in order to continue. Full-time probation students who drop below 12 hours (six hours in a summer session), without prior approval, after the last day of the second week of classes, will be academically suspended. Such students will have the same right of appeal as other suspended students. However, if reinstatement is granted to a student in this category with a semester GPA of 2.00 or higher, academic suspension will not be noted on the student's transcript. If dropping below full-time status during the semester becomes necessary, students should contact their student academic services directors regarding procedures.

1.8 Reinstatement after Academic Suspension. A student who has been suspended from the University for academic reasons may not be readmitted until one regular semester (fall or spring) has elapsed (unless the faculty appeals committee grants immediate reinstatement).

Readmission after one regular semester has elapsed will be considered on the merits of the individual case. Suspended students can be readmitted only one time. If a student is suspended a second time, he or she must attend another institution and raise the retention GPA before readmission to OSU can be considered.

1.9 Readmission. A student who has attended OSU but was not enrolled during the immediate past semester (except the summer session) must file an Application for Readmission. A student who has enrolled in another college or university since last attending OSU must file a transcript from each school. Admission status will be determined after an evaluation of the previous work has been made.

1.10 Withdrawing from the University. The withdrawal process is initiated in the student's dean's office.

A student who withdraws prior to the end of the sixth week of a regular semester or the third week of a summer session 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) or "F" (failing) as assigned by the instructor of each course. The grade of "F" 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" (when appropriate) "I," "NP," "P," "S," "U," or "X" by the instructor of each course at the end of the semester or summer session.

2. Student Status

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

<table>
<thead>
<tr>
<th>Class</th>
<th>Credit Hours Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>fewer than 28 semester credit hours passed</td>
</tr>
<tr>
<td>Sophomore</td>
<td>28 to 59 semester credit hours passed</td>
</tr>
<tr>
<td>Junior</td>
<td>60 to 93 semester credit hours passed</td>
</tr>
<tr>
<td>Senior</td>
<td>94 or more semester credit hours passed</td>
</tr>
</tbody>
</table>

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

Students engaged in an internship or cooperative education program assignment that requires full-time work on the assignment are regarded as full-time students when they are enrolled in the number of credit hours deemed appropriate for the academic credit they receive for the assignment.

A student holding a 0.50 FTE graduate assistant appointment, and enrolled in a minimum of six hours during the fall or spring semester, and three hours during the summer semester will be certified as a full-time graduate student. Any FTE appointment less than 0.50 requires nine hours of enrollment for the fall or spring semester, and four hours 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 leading to a master'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.
2.3 Part-time Students. Students who are enrolled but not meeting the definition of full-time students are classified as “part-time.” Undergraduate students are classified as “half-time” if they are enrolled in six hours in a regular semester (or three hours in a summer session). Graduate students are classified as “half-time” if they are enrolled in four hours in a regular semester (or two hours in a summer session).

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

3. Requirements

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

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

3.3 Honors Programs. (See “Honors Programs” in the Catalog.)

3.4 General Education Requirements. Although there is a University-wide general education program, each college determines and publishes the general education requirements for its degree programs. College requirements may exceed the minima for general education established by the University, which are:

a. 40 semester credit hours, including six semester credit hours of English composition; (by OSRHE policy, these 40 hours are exclusive of physical education activity courses);

b. three semester credit hours of American history (HIST 1103), and three semester credit hours of American government (POLSC 1113);

c. at least six semester credit hours in approved general education designated areas of Analytical and Quantitative Thought, Humanities, Natural Sciences, and Social and Behavioral Sciences (at least one course in each of these four areas must come from the approved general education lower-division course list, and at least three hours of (A) must be a general education MATH course);

d. at least one course in the International area and one course in the Scientific Investigation area.

Substitution of general education courses is allowed when background for the major demands greater depth in an area in which a general education requirement is stated. Only in the Analytical and Quantitative Thought (A) and Natural Sciences (N) areas is substitution of the more advanced lower-division course permitted. Such a substitution requires the recommendation of the student’s academic adviser and dean and the approval of the Office of the Provost and Vice-President for Academic Affairs.

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

A Analytical and Quantitative Thought
H Humanities
L International Dimension
N Scientific Investigation
S Natural Sciences
S Social and Behavioral Sciences

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

3.5 English Composition Requirement. The University requires a minimum of six semester credit hours in English composition for a baccalaureate degree. The required sequence of courses is ENGL 1113 and ENGL 1213. For those who qualify, ENGL 1013 or 1313 may be substituted for ENGL 1113. Students who earn an “A” or “B” in ENGL 1113 (or ENGL 1013 or 1313) or who earn three semester credit hours in English composition by advanced standing examination, and who have the consent of their college, may substitute ENGL 3323 for ENGL 1213. Students who qualify may substitute ENGL 1033 or 1413 for ENGL 1213. A third course may be required by the student’s college to satisfy either an additional composition or oral communication requirement.

3.6 English Proficiency Examination. Effective October, 1993, the English Proficiency Examination was waived for students who had matriculated since Fall 1988 through Spring 1994.

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, and the total number of 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 on probation, or not making satisfactory 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 commencement date, the degree will be granted at the next scheduled commencement after the student files a diploma application. (See "Diploma Application.") The student may receive a certified statement of completion of graduation requirements at the Office of the Registrar. All candidates for degrees must have their names listed in the commencement program.

3.11 Second Baccalaureate Degree. A student who receives a baccalaureate degree from OSU may use all applicable courses toward a second baccalaureate degree. A minimum of 30 semester credit hours of additional work, including all requirements of the second baccalaureate degree, is required. The Bachelor of University Studies degree has separate requirements.

4. Credits

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

4.2 Extension and Correspondence Credit. Academic credit is awarded for courses offered through the extension offices of the six colleges, by the Independent and Correspondence Study Center of OSU, or by transfer of work certified as extension or correspondence credit by another fully accredited institution.
Extension Credit. OSU will accept, toward a degree, a maximum of eight semester credit hours earned through extension at another institution if that institution is fully accredited. Credits earned through extension plus any earned through correspondence cannot exceed one-fourth of the credits required for a baccalaureate 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 baccalaureate degree.

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

4.4 Transfer Credit from Junior Colleges. Credits will be accepted by transfer from a junior college to meet lower-division (i.e., 1000- and 2000-level courses) requirements only. A minimum of 60 semester credit hours must be earned at a senior college. 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 transcripts with grade-point averages below "C" will be placed on a student's transcript.

4.6 Credit by Exam. The academic regulations listed below apply to the following examinations: Advanced Placement Program (AP), International Baccalaureate Program (IB), College Level Examination Program (CLEP), Proficiency Examination Program (PEP) and OSU Advanced Standing Examinations.

a. credit earned by examination will not be placed on a student's transcript until he or she has successfully completed 12 or more semester credit hours of academic work at OSU; and
b. credit will be recorded with a grade of "P" if the student earns the equivalent of a "C" or better on the examination. No grade is recorded if the student fails the exam; and

c. the student must need 15 or more semester credit hours at OSU (excluding the hours in which currently enrolled) toward meeting the requirements for the degree;
d. the amount of credit by exam which may be applied to a degree program is subject only to meeting the residency requirements of OSU (see "Residence Requirements");
e. a native speaker of a foreign language (one whose high-school level instruction was conducted principally in that language) cannot earn credit toward graduation in lower-division (1000-2000 level) courses in a language (see "Foreign Language Credit for Native Speakers");
f. the student must need the course to meet some requirement for a certificate or degree being pursued at OSU;
g. be enrolled at OSU;
h. OSU Advanced Standing Examinations may be offered by academic departments on campus in subject areas not offered through the examination programs listed above. Any currently enrolled student whose travel, employment, extensive readings or educational experience appear to have given the student proficiency in a subject that is offered at OSU, equivalent to the proficiency ordinarily expected of those students who take the subject in a regular class, may apply for an examination on the subject.

In addition to the regulations listed above, to qualify for an OSU Advanced Standing Examination the student must:

h. not have taken an exam over the course within the preceding six months;
i. receive the recommendation of the Office of Admissions, the approval of the head of the department in which the course is offered and the dean of the student's college;
j. present a valid student I.D. at the examination.

Information and application forms pertaining to OSU Advanced Standing Examinations may be obtained from the Office of Admissions.

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

a. be enrolled at OSU at the time the student takes the examination;
b. present the necessary evidence to prove that the student has taken the course;
c. obtain the recommendation of the Office of Admissions and the approval of the dean and head of the department in which the course is offered;
d. take the examination within the first semester after entering OSU;
e. take only one such examination in each subject;
f. present a valid student I.D. upon examination.

The student obtains the examination form at the Office of Admissions. The dean of the college in which the course is offered appoints a committee of three to construct, administer and evaluate the examination. The result is reported to the Office of Admissions and the Office of the Registrar where a "P" grade is recorded if the examination result is "C" or better. No fee is required.

4.8 Graduate Credit Hours for a Senior. A senior 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 must meet the same admission requirements and be subject to the same possible probationary or provisional restrictions as students admitted in graduate status. The student must achieve an overall 3.00 grade-point average in all courses and make no less than a "B" in those courses for which he or she wants graduate credit;
b. the credits must not be required or needed for the baccalaureate degree;
c. the total registration must not exceed 18 credit hours for a semester or nine credit hours for a summer session;
d. the student must either complete the requirements for the baccalaureate degree at the end of the semester or summer session or be within 12 semester credit hours of completing such requirements at the beginning of the semester or summer session in which graduate credit is requested;
e. admission to courses taken for graduate credit must have the approval of the course instructor, the head of the department in which the courses are offered and the dean of the Graduate College;
f. not more than 15 semester credit hours taken while a senior may be approved for graduate credit, and a minimum of 15 semester credit hours must be completed in residence after the student
registers in the Graduate College. Courses taken for graduate credit during the senior year may not be accepted for graduate credit at institutions other than OSU; g. the use to be made of the graduate courses will be determined by the adviser when the student registers in the Graduate College and submits a plan of study for an advanced degree.

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

4.10 Foreign Language Credit for Native Speakers. A native speaker of a foreign language cannot enroll in or earn credit toward graduation in lower-division (1000- 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 three hours of credit. A course numbered 3321 is ordinarily taken, although enrollment is not exclusive as to student classification; it indicates the class year in which the subject is taught, through DANTES examinations, advanced standing in subject matter that they mastered while in the Armed Forces.

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. (Exception: A course may be added at the time another course is dropped, if approved by the student's adviser and the instructor of the added course, and if the course is added prior to the last day to drop with no grade recorded.) 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 "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 "W" (dropped) or "F" (failing) as assigned by the instructor. The grade of "F" 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 not drop a course and shall be assigned only the grade of "A," "B," "C," "D" or "F," or (when appropriate) "I," "IP," "P," "S," "U," or "X" 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 "W" or "F" assigned by the instructor.)

No course may be dropped without the approval of the student's academic adviser.

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" or "F" (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.

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 residence 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 their first enrollment to establish, through DANTES examinations, advanced standing in subject matter that they mastered while in the Armed Forces.

5.6 Prerequisites to Upper-division and Graduate-division Courses. When no prerequisites are listed for courses numbered 3000 or 4000, it is understood that the prerequisite is 60 credit hours of work completed, or 45 credit hours of work completed with an overall grade-point average of 3.25. The prerequisite for courses at the 5000 or 6000 level is graduate standing in addition to any other prerequisites listed. Instructors may waive prerequisites when the student's background justifies this action. Prior approval of the instructor may be required in problems courses, independent study, internships, thesis and dissertation courses, and courses taught in a professional school.

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

5.8 Priority Enrollment. 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 will be given priority in enrolling. Scholarships that qualify students for priority in turning in trial schedules are University band, athletic, and graduate teaching assistantships for teaching or research assignments. Wentz scholars, President's Distinguished Scholars (PDS), President's Leadership Council (PLC) recipients, and participants in the OSRHE Academic Scholars program 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.) Full-time employees of the University who
have approval for enrollment may turn in their Trial Schedule forms to the Office of the Registrar any time after the class schedule book is available. An effort will be made to schedule classes of full-time employees to minimize conflict with their University employment. 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 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.

5.10 Payment of Tuition and Fees. Each student is provided an estimate of their tuition and fees at the point of registration. All fees (required and optional) and tuition associated with the student's enrollment are due in the Office of the Bursar no later than 4:30 p.m. on the 15th day of each month following billing. Failure to receive a bill, which is normally mailed to the student's local address, does not relieve the student from the financial obligation, any finance charges, and other penalties that may occur if the account is not paid by the monthly due date. Fall semester fees are due by September 15, spring semester fees are due by February 15, and summer session fee due dates vary depending on the session. All accounts not paid in full by the due date will accrue an interest penalty at the rate of 1.5 percent monthly (19.56 APR). 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 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 credit in a course, but wishes to change taking an examination to obtain credit or ask in any way for the privilege of auditing that course, the student must officially drop the course (or, if appropriate, withdraw,) at the time the student changes to audit.

A student who has established a permanent record at OSU may have the audited course recorded on his or her transcript with "AU" appearing in place of the grade. Not later than one week after the close of that semester, the student must present to the Office of the Registrar the instructor's copy of the audit form with a signed statement from the instructor, on the reverse side, that it is appropriate for the course to be recorded on the student's transcript.

Any individual 65 years or older may audit a class at no charge.

5.12 Minimum Class Size. The minimum number of students required in order for a class to meet is as follows: 20 students for lower-division classes, 12 students for upper-division classes, and eight students for graduate-level classes.

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," "W," or "X." Descriptions of the grades are:

Grade "A" Excellent
Grade "B" Good
Grade "C" Average
Grade "D" Below average
Grade "F" Failure

Grade "I." This grade is given to a student who satisfactorily completed the majority of the course work and whose work averaged "D" or better, but who has been unavoidably prevented from completing the remaining work of the course. The conditions, including appropriate time limits, for the removal of the "I" are indicated on the official class roll by the instructor. A condition that the student must repeat the course in order to remove the "I" is not permitted. The maximum time allowed for a student to remove an "I" is one calendar year. The dean of the student's college may recommend to the Office of the Registrar the adjustment of this period in exceptional circumstances. It is the responsibility of the student to satisfy the requirements stipulated by the instructor at the time the "I" is assigned; it is the responsibility of the instructor to initiate action to 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 "X" symbol from the transcript, but a second entry is posted beside the original "X" on the transcript to show the final grade.

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

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

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

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.
6.4 Grade-point Average Calculating. In calculating grade-point averages, the total number of grade points earned is divided by the total number of hours attempted. The grade of "I," "NP," "P," "S," "U," "W," and "X" are recorded as "NP." "W" and "I" grades are recorded without change. The pass-no pass grade will not affect the grade-point average.

Graduate students should refer to the "Graduate College" 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 by 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 announced grading policy. (See "Student Rights and Responsibilities" or contact the Office of the Provost and Vice-President for Academic Affairs.)

6.12 Academic Dishonesty or Misconduct. Academic dishonesty or misconduct is neither 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.)

6.13 Academic Forgiveness. Repeated Courses. A student may repeat a course and have only the second grade, even if it is lower than the first grade, included in the calculation of the graduation and retention grade-point averages up to a maximum of four courses but not to exceed 18 credit hours in which the original grade was a "D" or "F." If a course is repeated more than once, all grades except the first attempt are included in the grade-point averages. The original course and grade remain on the transcript identified with an asterisk (*). All other repeated courses, those in excess of the 12-hour maximum and those with a grade of "C" or better in the original course, are included in the grade-point averages and identified with an "at" sign (′) on the transcript.

Academic Reprieve. A student may request an academic reprieve for all courses in one semester or two consecutive semesters if the following conditions are met: (a) at least three years must have elapsed between the period in which the grades being requested were earned and the reprieve request; (b) the student must have

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Grade "F" yields 0 grade points per semester credit hour.

Semester Grade-point Average. For purposes other than retention, all grades are included in the calculation. For retention purposes, activity, performance and remedial courses are excluded from the calculation.

Graduation and Retention Grade-point Averages. All courses in which a student has a recorded grade are included in the calculation, excluding any courses repeated (with an original grade of "D" or "F") or reprieved and excluding remedial courses and physical education activity courses. (See "Academic Forgiveness.")

Cumulative Grade-point Average. All courses in which a student has a recorded grade are included in the calculation.

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 freshman 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:

- have passed 28 or more semester credit hours;
- have at least a 2.50 grade-point average in all hours attempted;
- have met all of the prerequisites for enrollment in the course in question;
- do not need the course in question for meeting any requirements for graduation or certification other than as a general (unrestricted) elective;
- have approval of the 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 may not change the choice of 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 quality of the work performed. The grades of "A," "B" and "C" are recorded on the transcript as "P"; the grades of "D" and "F" are recorded as "NP." "W" and "I" grades are recorded without change. The pass-no pass grade will not affect the grade-point average.

Graduate students should refer to the "Graduate College" section of the Catalog.

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."

Graduate students should refer to the "Graduate College" 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 by 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 announced grading policy. (See "Student Rights and Responsibilities" or contact the Office of the Provost and Vice-President for Academic Affairs.)

6.11 Honor Rolls. Full-time Students. Full-time undergraduate students (12-or more semester credit hours in a regular semester or six or more in a summer session) who complete all enrolled hours with a semester (not cumulative) grade-point average of 4.00 (i.e., all "A's") and with no grade of "I" in any course are placed on the President's List of Distinguished Students. The grade of "P," "S" or "W" or grades earned through correspondence may not be included in meeting the minimum enrollment required or grade-point average required for an honor roll. Dropping a course prohibits a part-time student from being listed on an honor roll. Special (non-degree-seeking) students are not included on an honor roll. Students who have completed their courses under the same requirements as outlined above, with a combined grade-point average of 3.50 or higher and no grade below "C," are placed on the Dean's List of Distinguished Students.

(Beginning Spring 1995, and retroactive to include Fall 1994, the Dean's List grade-point average was 3.50.)

6.12 Academic Dishonesty or Misconduct. Academic dishonesty or misconduct is neither 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.)

6.13 Academic Forgiveness. Repeated Courses. A student may repeat a course and have only the second grade, even if it is lower than the first grade, included in the calculation of the graduation and retention grade-point averages up to a maximum of four courses but not to exceed 18 credit hours in which the original grade was a "D" or "F." If a course is repeated more than once, all grades except the first attempt are included in the grade-point averages. The original course and grade remain on the transcript identified with an asterisk (*). All other repeated courses, those in excess of the 12-hour maximum and those with a grade of "C" or better in the original course, are included in the grade-point averages and identified with an "at" sign (′) on the transcript.

Academic Reprieve. A student may request an academic reprieve for all courses in one semester or two consecutive semesters if the following conditions are met: (a) at least three years must have elapsed between the period in which the grades being requested were earned and the reprieve request; (b) the student must have
earned a GPA of 2.00 or higher with no grade lower than a "C" in all regularly graded course work (a minimum of 12 hours) excluding activity, performance and remedial courses since the semester requested to be reprieved; (c) the student has not previously been granted an academic reprieve for a semester; (d) there were extenuating circumstances which caused the student to perform poorly during the semester.

The request for an academic reprieve must be submitted on the appropriate form to the Office of the Provost and Vice-President for Academic Affairs. A faculty committee appointed by that office reviews each request and either approves or denies a request based on whether or not the student meets the conditions stated above and the committee's judgement concerning the extenuating circumstances reported by the student. The courses for a semester that is reprieved are excluded from the graduation and retention grade-point averages and identified with a pound (#) sign on the transcript.

7. Graduation

7.1 Graduation Requirements. The responsibility for satisfying all requirements for a degree rests with the student. Advisers, faculty members and administrators offer help to the student in meeting this responsibility.

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. (By OSRHE policy, these 120 hours are exclusive of physical education activity courses.) 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. (By OSRHE policy, these 40 hours are exclusive of physical education activity courses.) Hours of "S" or "U" earned in remedial courses may not count toward total hours.

7.6 Grade-point Average for Graduation. A graduation grade-point average of 2.00 or higher is required for all courses in which a student has a recorded grade, excluding any courses repeated or reprieved and excluding remedial courses and physical education activity courses. (See "Academic Forgiveness.") This is 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 met 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. Attendance is not compulsory. However, candidates who cannot be present should notify the Office of the Registrar of the addresses to which diplomas can be mailed.
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.)

Bachelor's
Master's
Doctor's
Specialist

Agricultural Sciences and Natural Resources
A S Arts and Sciences
Business Administration
Education,
Engineering
Human Environmental Sciences
Graduate College
Osteopathic Medicine
Technology
Veterinary Medicine

Accounting (B,M) Bus/Gr
Aerospace Studies (B) A S Agribusiness (B) Ag/Bus
Agricultural Communications (B) Ag
Agricultural Economics (B,M,D) Ag/Gr
Agricultural Education (B,M,D) Ag/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 and Reproduction (D) Gr
Animal Nutrition (D) Gr
Applied Behavioral Studies (M,D) Gr
Applied Educational Studies (D) Gr
Applied Mathematics (M) Gr
Architectural Engineering (B,M)
En/Gr
Architecture (B,M) En/Gr
Art (B) A S
Aviation Sciences (B) Ed
Biochemistry (B) A S
Biochemistry and Molecular Biology (B,M,D) Ag/Gr
Biological Science (B) A S Biosystems Engineering (B,M,D) En/Gr
Botany (B,M,D) A S/Gr
Business Administration (M,D) Gr
Cell and Molecular Biology (B) A S
Chemical Engineering (B,M,D) En/Gr
Chemistry (B,M,D) A S/Gr
Civil Engineering (B,M,D) En/Gr
Computer Science (B,M,D) A S/Gr
Construction Management Technology (B) T
Corrections (M) Gr
Counseling and Student Personnel (M) Gr
Curriculum and Instruction (M,D) Gr
Design, Housing and Merchandising (B,M) HES/Gr
Economics (B,M,D) A S/Bus/Gr
Education (S) Gr
Elementary Education (B) Ed
Secondary Education (B) Ed
Educational Administration (M,D) Gr
Electrical Engineering (B,M,D) En/Gr
Electronics Technology (B) T
English (B,M,D) A S/Gr
Entomology (B,M,D) Ag/Gr
Environmental Engineering (M) Gr
Environmental Science (B,M,D) Ag/Gr
Family Relations and Child Development (B,M) HES/Gr
Finance (B) Bus
Fire Protection and Safety Technology (B) T
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
Forestry Resources (M) Gr
Forestry (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) Ed
Health, Physical Education and Leisure (M) Gr
Higher Education (M,D) Gr
History (B,M,D) A S/Gr
Horticulture (M) Gr
Horticulture and Landscape Architecture (B) A S
Hospitality Administration (M) Gr
Hotel and Restaurant Administration (B) HES
Human Environmental Sciences (D) Gr
Industrial Engineering and Management (B,M,D) En/Gr
International Business (B) Bus
Journalism and Broadcasting (B) A S Mass Communications (M) Gr
Leisure (B) Ed
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) A S
Microbiology, Cell and Molecular Biology (M,D) Gr
Military Science (B) A S
Music (B) A S
Music Education (B) A S
Natural and Applied Sciences (M) Gr
Nutritional Sciences (B,M) HES/Gr
Occupational and Adult Education (M,D) Gr
Osteopathic Medicine (DO) OM
Philosophy (B,M) A S/Gr
Physical Education (B) Ed
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,D) A S/Gr
Premedical Science (B) A S
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
Telecommunications Management (M) 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 86
Master's 65
Doctor's 45
Specialist 1

Oklahoma State University 51
College of Agricultural Sciences and Natural Resources

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

Science, technology, business, education, research, production and environment are key elements in America’s largest industry. In order to feed and clothe the five billion people of the world, the agricultural industry needs human capital-scientists and specialists with needed skills in molecular genetics, human nutrition, soil and water sciences, international marketing, systems analysis, biosystems and agricultural engineering and other specialties.

The diverse careers available in agriculture offer many choices, and college graduates are needed to fill a wide variety of jobs in American agriculture. Graduates are needed in scientific research, marketing, financial services, and the processing of information, as well as production. OSU graduates can be a part of the modern agricultural technology that will bring new discoveries and techniques to the world.

The College of Agricultural Sciences and Natural Resources prepares students to analyze information, explore opportunities and solve problems. Students are prepared in the science and technology of agriculture, and they also receive a solid general education in communications, humanities and social sciences. In the new agriculture, the graduate will have a rewarding career that will last as long as food is consumed and fiber is grown on this earth.

Accreditation
Agricultural Sciences and Natural Resources include broad and diverse professions and do not have a single accrediting society as do some other professions. Programs in agricultural education, agricultural engineering, forestry, and landscape architecture are accredited by their professional organizations.

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 Agricultural Sciences and Natural Resources degree is offered in the following major fields of study: agribusiness, agricultural communications, agricultural economics, agricultural education, agronomy, animal science, biochemistry and molecular biology, entomology, environmental science, forestry, horticulture and landscape architecture, and pre-veterinary science. The Bachelor of Landscape Architecture is also offered in the College of Agricultural Sciences and Natural Resources.

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, crop science, entomology, food science, plant pathology, and soil science.

High School Preparation and Admission Requirements
The high school preparation and admission requirements for the College are the same as the general University requirements. A solid background in English, algebra, and natural science 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, no more than 65 hours from a two-year college will be used to meet the College’s degree requirements. 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 Agricultural Sciences and Natural Resources are annually awarded more than $300,000 in scholarships from the College and its departments. The following areas will be considered in the awarding of scholarships: scholastic standing in high school or college; leadership qualities which have been shown in school, church, community or youth groups; financial need; sincere interest in agriculture.

Applications and additional information may be obtained from the Office of the Associate Dean, College of Agricultural Sciences and Natural Resources, Oklahoma State University, 136 Agricultural Hall, Stillwater, OK 74078. Applications for new students may also be obtained from local high schools. Applications are available beginning November 1.

Academic Advising
All students in the College 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 Agricultural Sciences and Natural Resources 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 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 higher are eligible to become a part of the Honors Program. Sophomores, juniors, and seniors, with minimum cumulative grade-point averages of 3.25, 3.37, and 3.50, respectively, 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 Agricultural Sciences and Natural Resources 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 (6 hours minimum): ENGL 1113 and 1213; or 1313 and 1413.
- Technical/Professional writing or English elective (2 hours minimum).
- 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 3112).

- Physics (8 hours minimum): PHYS 1114 and 1214.
- Mathematics (3 hours minimum): MATH 1513 (or any higher level mathematics).
- Biological science (14 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 BIOL 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 the Catalog and the current Veterinary Medicine at Oklahoma State University brochure. Students are also encouraged to contact the Office of the Assistant Dean for Academic Programs in the College of Agricultural Sciences and Natural Resources.

Pre-veterinary Science Degree. A Bachelor of Science in Agricultural Sciences and Natural Resources degree 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 Agricultural Sciences and Natural Resources must be met. Specific plans of study may be obtained from the Office of the Assistant Dean for Academic Programs, 136 Agricultural Hall.

General Education Requirements
The College of Agricultural Sciences and Natural Resources 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 the Catalog. In addition, specific requirements must be met for the Bachelor of Science in Agricultural Sciences and Natural Resources and Bachelor of Landscape Architecture degrees. For the B.S. degree, the required total semester credit hours varies by department, major and option. 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 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
Environmental Science Club
Food Industry Club
Forestry Club
Horticulture Club
National Agri-marketing Association
OSU Horseman’s Association
Pre-veterinary Medicine Club
Sanborn Entomology Club
Sigma Lambda Alpha (horticulture and landscape architecture)
Society of American Foresters
Society of Range Management
Soil and Water Conservation Society
Turf Club
Xi Sigma Pi (forestry honor society)
**Agricultural Communications**

Professor and Head James G. Leising, Ph.D.

Modern agriculture, with its diversity and specialization, requires accurate communication between the industry’s segments and with the general public. Education in agriculture and journalism trains the agricultural communications student to provide the necessary communications link.

By majoring in agricultural communications, a student may choose a special-interest area such as advertising, public relations, radio and television broadcasting, photography, reporting and newswriting, or research report writing. Opportunities are also available for the student to develop a double-major program with other departments in the College of Agricultural Sciences and Natural Resources.

For the graduate with a bachelor’s degree and a major in agricultural communications, career opportunities are abundant in agricultural production, industry, and service organizations as well as with publishing firms, broadcast stations or other media.

**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 guidelines 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 management 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, agribusiness, agricultural financial management, resource conservation and development, agricultural pricing, rural development, 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 or her personal interests, objectives and needs.

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

Agribusiness is a major at Oklahoma State University. The major in agribusiness is administered through the Department of Agricultural Economics. This major is oriented toward subject matter that prepares students for decision making in agribusiness firms.

**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 give direction and individual guidance to student research in marketing, production, management of agricultural enterprises, price analysis, land and water use and development, rural development and planning, agricultural finance, international trade, farm appraisal and agricultural policy. Specialization is achieved through course electives and research topics. Each student is guided in the preparation of the program of study by an advisory committee to assure that background or prerequisite work and the graduate plan will lead to the desired depth and breadth of proficiency.

**Admission Requirements.** Prerequisites to advanced training in agricultural economics are (1) the desire to understand and solve the complex 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 certain cases, a part of this work can be taken after admission but will not count toward a graduate degree.

Acceptance by an adviser in the department is not required prior to official admittance to the departmental graduate program.

**Agricultural Education**

Professor and Head James G. Leising, Ph.D.

The programs of study offered in agricultural education are designed to provide both comprehensive and specialized training to prepare graduates for careers in a wide range of fields of agriculture. In addition to being prepared for licensure as teachers, graduates are professionally prepared for work in cooperative extension and other federal and state programs and services, as well as international education endeavors. Graduates also may find employment as educational directors and consultants with agribusiness firms and organizations. Studies may culminate in the B.S., M.Ag., M.S. or Ed.D. degrees.
The undergraduate teaching option is designed 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 states. The professional service option is designed to focus on careers relating to education or service in agriculture, outside of the public school setting. Primary emphasis is upon employment in cooperative extension or closely allied areas. Some students find it advantageous to elect a dual major, thus meeting requirements in both agricultural education and another major within the College of Agricultural Sciences and Natural Resources. The undergraduate programs in agricultural education are structured to provide educational experiences in general education, agriculture and professional education.

Graduate Programs

Graduate programs in 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 for other educational careers in agriculture, agribusiness, government service, extension, or adult education. An attempt is made to develop individual study programs to meet needs of both international and domestic students.

The Master of Agriculture is offered to further knowledge and skills of agriculture and education in preparation for and advancement in teaching, extension, administration and other professional areas. Three options are offered in the Master of Agriculture program. Option A requires 32 approved semester credit hours of course work, including a two-credit-hour formal report. Option B requires 36 approved semester credit hours of course work, including a two-credit-hour creative component, which may involve curriculum, teaching methods, literature or some similar area. Option C requires 36 approved semester credit hours of course work, which include six hours of credit for a professional internship.

The Master of Science develops the theoretical and research foundation for further graduate studies in addition to further knowledge and skills in agriculture and education. It is designed primarily for those students interested in research who may later wish to continue their graduate studies toward a specialist or doctoral degree. A total of 30 approved credit hours of course work, which includes a six-credit-hour formal thesis following the graduate college format, is required.

The Doctor of Education program is designed to prepare graduates for careers in teacher education, supervision, administration, curriculum development and other areas of professional leadership in agriculture, agricultural extension or vocational education. Within the minimum 60 credit hour requirement, 20 credit hours must be completed in agricultural education. In addition, 20 credit hours must be completed in an area of specialization like agricultural extension, technical agriculture, educational administration, or other similar area. The remaining 20 credit hours includes research design, statistics and the dissertation.

Full admission to the master's degree program requires a bachelor's degree in agricultural education, agriculture, education, or related area and a grade-point average of 2.80 or higher. For grade-point averages below 2.80, combinations of experience, references and standardized test scores can be considered. Provisional or deferred admission may also be granted.

Full admission to the doctoral degree program requires a minimum of a 2.80 undergraduate grade-point average and a 3.00 grade-point average in 24 or more graduate credit hours; a composite score of 1000 or higher on the Graduate Record Examination or 48 or higher on the Miller Analogy Test; three years of successful professional experience; written evidence of ability to express thought with reasonable clarity, correctness, and precision; and three strong recommendations for graduate study. Alternative criteria may be considered by the graduate committee for those who submit ample supportive evidence of other exemplary qualifications.

Student fee waivers are available for qualifying master's degree candidates. A grant and loan program is available through the Office of Student Financial Aid.

Agriculture

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

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 Catalog, "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 Office of the Associate Dean for Academic Programs and must
Agronomy

Professor and Head Robert L. Westerman, 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. 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.

Modern agricultural production requires a highly technical approach to problems such as soil and water conservation, crop and range management, prevention and abatement of agricultural sources of environmental pollution, and judicious use of agricultural chemicals and land application of wastes. 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, fertilizer, pesticides and management systems. 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 can not be ignored.

A major challenge facing agronomists is the concern for preserving environmental quality while maintaining efficient food production systems. Agronomists are involved with detailed evaluation of the impact of crop and soil management practices on land, water and air resources. Recent concerns for environmental quality and food safety have created a high demand for professional agronomists to assist farmers in proper utilization of production input such as fertilizers and agricultural chemicals. Developments in basic science fields such as genetics and molecular biology have created a need for agronomists to work in biotechnology programs with plants and soil organisms.

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

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

Graduate Programs

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

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

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

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

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

Plan I-Thesis, minimum of 30 credit hours of course work, including six credit hours of AGRON 5000, master’s thesis.

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

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

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

Option B-Minimum of 36 credit hours of course work and a creative component.

Option C-Minimum of 36 credit hours of course work including six hours of credit (AGRON 5230, Research) for a professional internship. The internship will consist of professional practice and an informal report. Internships for students with previously established vocations and career experience must be in areas other than the specific vocational field of the students.

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

Professor and Head Donald G. Wagner, 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 Agricultural Sciences and Natural Resources degree. Graduate studies culminate in the Master of Science, Master of Agriculture (emphasis in animal science) or the Doctor of Philosophy in nutrition, animal breeding, animal reproduction or food science.

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

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

Undergraduate students may elect an option in the areas of animal biotechnology, business, food industry, food science, livestock merchandising, pre-veterinary animal science, production, and 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 and Bridle, Dairy Science, Horsemens’ Association or Food Industry clubs) or judging teams (livestock, meat, horses, dairy cattle, 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 introductory courses in agriculture and business. Upper-class students take a basic core of advanced animal science courses including genetics, physiology, nutrition or food science. As seniors, students complete a series of advanced animal science courses which are designed to apply knowledge obtained in previous courses 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; employment with state and federal agencies concerned with inspection, grading or regulation; sales and service positions with companies involved with feeds, pharmaceuticals or other livestock products; opportunities in agricultural extension or teaching; and work in the processing, distributing and merchandising of dairy, poultry and meat products. Students who earn the master’s 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 or 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 and reproduction, animal nutrition, and food science.

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

Biochemistry and Molecular Biology

Professor and Head James B. Blair, 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. Major discoveries concerning the biochemistry of genetic material provide the tools of molecular biology that are essential to contemporary life sciences research.

Biochemists and molecular biologists 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 education in mathematics, physics and chemistry.

Challenging positions for well-trained biochemists and molecular biologists 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 and molecular biology administered by the Department of Biochemistry and Molecular Biology is
available through the College of Agricultural Sciences and Natural Resources. The department also offers a B.S. degree in biochemistry through 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 and molecular biology curriculum provides students with sufficient background 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 course work, a major part of the program in the Department of Biochemistry and Molecular Biology 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. The results of the three general GRE exams (verbal, quantitative, analytical) are required for entrance. An advanced GRE subject matter exam (biochemistry, chemistry or biology) is also recommended. A cumulative GRE score of 1500 is normally required.

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 the 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, including 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.

A non-thesis Master of Science degree is also available. It does not require a research thesis, but requires a report and extensive technical training in the laboratory. The non-thesis M.S. is not recommended for students wishing to pursue a Ph.D. program later.

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 September of his or her first year. A more comprehensive qualifying examination is also 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.

Biosystems and Agricultural Engineering

Professor and Head Billy J. Barfield, Ph.D., P.E.

The School of Biosystems and Agricultural Engineering is administered jointly by the College of Agricultural Sciences and Natural Resources and the College of Engineering, Architecture and Technology.

Biosystems engineers are professionals who protect the environment and preserve natural resources by creating and adapting engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of food, feed, fiber and other biological products. Biosystems engineering students study engineering, physical, mathematical and biological sciences. Biosystems engineering courses apply mathematics, basic engineering and science to create and design new systems and equipment for biological production and processing. Students work with computers on simulation, control and design of bioenvironmental projects. Required social studies and humanities courses help prepare students to work with people. These people skills are important for advancement into management level positions, a transition that often occurs early in a biosystems engineer's career.

A wide variety of employment opportunities are available for biosystems engineers in industry, public service and education. Some of these opportunities include positions in governmental agencies, consulting, machine industry, manufacturing and installation, and electric power management industries. Biosystems engineers have careers in foreign countries as well.

Students interested in a degree in biosystems engineering may initially enroll in either the College of Agricultural Sciences and Natural Resources or the College of Engineering, Architecture and Technology. Students who enroll in the College of Agricultural Sciences and Natural Resources should request a biosystems engineering adviser and transfer to the College of Engineering, Architecture and Technology by the end of their first semester.

Biosystems engineering courses for juniors and seniors integrate the engineering sciences with biological sciences and teach students to design solutions to real problems of society. Students work both as individuals and in teams to solve real world design problems provided by industrial firms who hire biosystems engineers. Design experiences are developed in one or more of the following areas: environment and natural resources, food and bioprocessing, biotechnical and general agricultural engineering.

In addition to the 76 semester credit hours of common requirements for engineers, biosystems engineering students take courses in electronic applications, instrumentation, watershed hydrology, flood control, drainage and irrigation, environmental engineering, power and machinery, structural design, processing, and food engineering. The 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 Biosystems and Agricultural Engineering offers three programs leading to post-baccalaureate degrees: Master of Biosystems Engineering, Master of Science and Doctor of Philosophy. The Master of Biosystems Engineering program places emphasis on design and internship in engineering experience. The Master of Science and Doctor of Philosophy degrees emphasize research and development.

Excellent facilities are available for students to explore research and design in bioprocessing and food engineering, physics of plant and animal environments, non-point-source pollution control, hydrology, water resources, water quality, air quality, wind erosion, machine development for biological systems, microelectronics, intelligent machines for biological production, irrigation design, and hydraulics.

Research projects are supported by the Agricultural Experiment Station and by state and federal grants. A well-trained faculty, many of them registered professional engineers with research, consulting and design experience, guide the graduate students’ activities and plan programs to meet students’ needs. Graduate students design experiments and special equipment to conduct their work. They are expected to demonstrate, by supporting research or by designs, the ability to propose a solution, identify a problem, define alternatives, organize a design 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. Students without accredited degrees may be admitted provisionally and may be required to take additional courses.

Admission to the Master of Biosystems Engineering degree program is permitted for students who meet the prerequisites as stated in the “College of Engineering, Architecture and Technology” section of the Catalog, under “Master of Engineering.” The departmental graduate committeewill 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.

Entomology

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

Entomology is the science and study of insects and related arthropods such as ticks, mites and spiders. This discipline offers students opportunities to explore the diversity of nature through the study of arthropods. In addition, they may learn about the sophisticated biological and physiological phenomena associated with these organisms. Discovery of the importance of arthropods as competitors with human society for food and fiber is a central theme in entomology. Arthropods serve as vectors of human and animal diseases, biomedical research organisms and pollinators. These animals also form an intricate part of the food web; regulation of pest populations must be done in an environmentally safe manner.

A strong academic background in the physical and biological sciences is essential before enrolling in specialized subject matter in entomology. Specialized subject matter includes insect identification, biology, ecology, physiology, biochemistry, population dynamics, medical and veterinary entomology and pest management.

There are many diverse job and career prospects for graduates. Current undergraduates are preparing for careers in veterinary medicine, medicine, law and graduate school. Others gain employment with private industry, research laboratories, or county, state or federal agencies. Some develop their own businesses as consultants and entrepreneurs.

Graduate Programs

The department offers programs of study and research leading to the degrees of Master of Science and Doctor of Philosophy. Students making application must be accepted by an adviser and approved by the departmental graduate committee prior to being admitted to the Graduate College.

Each program of study will be under the direction of an advisory 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. An oral examination is required of all candidates and M.S. students are also required to defend publicly. Graduate student candidates are required to meet with their advisory committees every six months for program reports and examinations. Doctoral candidates are required to present public defenses of their dissertations and must assist in teaching one or more courses. Students supported as half-time research assistants are expected to be active participants in the research projects of their major professors.

Environmental Science

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

The College of Agricultural Sciences and Natural Resources offers an undergraduate major in environmental science. This program is an interdisciplinary study of the biological, chemical, and physical
factors, coupled with human activities, that affect the environment. Such a science is designed to improve the current and future welfare of the human race with environmental policies based on sound scientific principles and in accordance with the true benefits and costs as evaluated by an informed society.

Since this major is interdisciplinary and science-oriented, the student will take basic courses in biology, chemistry, math, physics, statistics, and several social sciences. The student may choose one of three areas of emphasis (options): water resources, natural resources, or environmental policy. Depending on the option, upper-division course work will involve problem-solving work in water and soil quality, economic and social policy, political science, resource management and engineering. The student will also be immersed in general education subjects, including communications, philosophy, ethics and sociology.

A primary goal of this program of study is to enable graduates to solve environmental problems according to a solid science base and in accordance with society's needs. Through successful completion of this major the student earns the Bachelor of Science in Agricultural Sciences and Natural Resources.

The environmental science undergraduate major is directly supported by faculty from the departments of Agricultural Economics, Biosystems and Agricultural Engineering, Agronomy, Animal Science, Entomology, Forestry, Horticulture and Landscape Architecture, and Plant Pathology. The major and its students also benefit from the resources and activities of the Center for Agriculture and the Environment on the OSU-Stillwater campus. Students benefit from working in and out of the classroom and laboratory with faculty who are conducting cutting-edge research involving environmental problems.

Graduates work in such areas as land-use planning, environmental control, natural resources management, waste disposal, water and soil quality, and policy analysis. Industries associated with the extraction, utilization and manipulation of natural resources have increased the number of employees with environmental training to address regulation compliance, litigation, monitoring, public relations and management practices.

Graduates may also work with federal, state and local government agencies involved in regulation, resource management and policy development. Graduates, particularly those who have gone on to earn advanced graduate degrees, find employment with consulting firms that are involved with solving environmental problems. Many graduates go on to graduate school or pursue a degree from a professional school, such as law or medicine.

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 managing, sustaining and utilizing the forest and its diverse resources: timber, water, wildlife, range forage, recreation and wilderness. Foresters devote effort to protecting forests from the harmful effects of fire, disease and insects. Foresters today are problem-solvers using a blend of ecology, technology, economics and sociology to provide benefits and services desired by society. Foresters work with private landowners and city planners, teach and conduct research at universities, administer parks and recreation areas, manage the business of forest industry, and manage public forest lands.

Graduates may be employed by federal agencies, including the U.S. Forest Service, Bureau of Land Management, the Soil Conservation Service, the Fish and Wildlife Service, and the Bureau of Indian Affairs. In addition, state, county and municipal governments employ foresters in a variety of resource management and service positions. Wood-using industries retain foresters for land management, land and timber acquisition and harvesting positions as well as in mill production and administrative work.

Foresters work for associations promoting the use of forest products and in many other public relations jobs. Some foresters are self-employed as consultants, specializing in timber and land appraisals, management planning and a variety of special services. Recipients of advanced degrees, especially the doctorate, may conduct industrial research or may enter the teaching profession.

The Department of Forestry offers a major in forestry leading to a Bachelor of Science in Agricultural Sciences and Natural Resources degree. Considerable breadth exists in the forestry curriculum, affording the student and faculty adviser the opportunity to develop a specialized curriculum focused on a wide array of natural resource specialties, such as water, recreation, range or wildlife. For the student with a research career in mind, course work in basic and applied science is available. Requirements for a B.S. degree include the successful completion of a nine-week summer camp and a total of 140 credit hours of course work. The summer camp is scheduled to follow the sophomore year and is held annually in spectacular forest settings. Past summer camps have been held across the U.S. from Maine to Oregon, from Montana to Florida, and even in Brazil. Students learn field forestry skills and observe state-of-the-art operations.

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

Graduate Programs

The Department of Forestry offers instruction leading to Master of Science degrees in forest resources and environmental science for students interested in graduate training with a research orientation. The Master of Agriculture degree with an emphasis in forestry is offered for students interested in non-research graduate work. Programs of instruction and research leading to a Doctor of Philosophy degree are available through cooperating departments, or in environmental science, crop science, or plant 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, forest management, and watershed management. The prerequisite for graduate study in the Department of Forestry is a bachelor's degree in an area aligned with the students' research interests with an overall undergraduate grade-point average of 3.00 ("B" average). Students without a bachelor's degree in a field of study aligned with their research interests may be required to complete a core of supporting courses as determined by the student's adviser and graduate committee. Applicants for graduate study who are also requesting financial assistance from the Department of Forestry are required to submit test results from the Graduate Record Examination for full consideration.
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, production, preservation and processing of flowers, trees, shrubs, turfgrass, vegetables, fruits and nuts. It also includes the proper environmental use and maintenance of plants in the landscape. Thus, horticulture is involved with the production and processing of a significant part of the nation's 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. The horticulture student must have a good understanding of plant biology and commercial production/maintenance and business practices.

Educational opportunities for study in horticulture cover a wide variety of plants and subjects and range from the cellular to the whole plant level. Factors such as nutrition, irrigation, genetics, propagation, control of flowering, and fruit and seed production are considered in their relationship to culture, production, harvesting, processing and storage. Students can prepare themselves for careers in public grounds administration (arboreums, parks and zoos), golf course management, horticulture business, sales and marketing, 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 B.S. degree and choose from the following two options:

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

Turf management provides the training for turfgrass production and for management of turfgrass in golf courses, parks, athletic fields, 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. Students from other departments may also choose to pursue a formal academic minor in horticulture.

Landscape architecture as a field deals with the planning and design or arrangement of natural and artificial elements on the land through preservation of existing natural and synthetic resources, and through application of cultural and scientific knowledge.

There are two options in the landscape area:

Landscape architecture is the study of design of outdoor spaces, with supporting courses in art, business, construction, ecology, engineering and horticulture in a five-year professional program leading to the accredited Bachelor of Landscape Architecture (B.L.A.) degree. The B.L.A. degree is accredited by the American Society of Landscape Architects. Typical employers include landscape architecture firms, architectural engineering firms and government agencies dealing with and 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 20 students each. Students will be evaluated during their third year by the faculty in order 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 a 2.50 GPA or higher in all courses required as prerequisites to the last two years of the B.L.A. program.

Landscape contracting is a four-year program leading to the Bachelor of Science in Agricultural Sciences and Natural Resources degree. It emphasizes the construction and management phases of landscape development. Course work includes basic landscape architectural design, construction technology, business and horticulture. The program is certified by the American Landscape Contractors Association. Graduates are employed by landscape nurseries, contracting companies, design and building firms, and landscape maintenance companies.

Graduate Programs

The department offers programs of study leading to the degrees of Master of Science and Master of Agriculture through the study of flower crops, fruit and nut crops, vegetable crops, ornamental nursery crops, and turf. In addition to commodity-oriented specialities, students may emphasize postharvest or stress physiology disciplines. Applicants should indicate their interest area(s). Research opportunities range from whole plant production/management studies to fundamental cellular studies. The department also offers a Ph.D. in crop science.

Prerequisites. Admission requires a bachelor's degree in horticulture or a related field with at least a 3.00 ("B")
grade-point average. Students with course work deficiencies in fundamental areas may be required to take remedial courses to attain proficiency in accordance with the advisory committee’s guidance.

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, mathematics, 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 management of plant diseases. Research problems are involved with on-going projects in the Oklahoma Agricultural Experiment Station, which include investigations on disease management (chemical, cultural, biological, and genetic) soil-borne diseases, virology, phytopathology, 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

The College of Arts and Sciences not only offers a wide variety of programs in teaching, research and extension, but also supports and reinforces all the other programs of the University. The College provides a number of more specialized and interdisciplinary strengths, and a variety of professional and preprofessional training. The College's 22 departments and two schools offer 46 degree programs at the bachelor's level, and in conjunction with the Graduate College, 23 master's and 14 doctoral degrees.

Apart from strong programs in the natural and social sciences and in the liberal and fine arts, the College provides 23 master's and 14 doctoral degrees. The College's 22 departments and two schools offer 46 degree programs at the bachelor's level, and in conjunction with the Graduate College, 23 master's and 14 doctoral degrees.

High School Preparation

The College of Arts and Sciences strongly recommends that high school students have: four years of English; at least three years of mathematics; three years of laboratory science; three years of social studies including American history and world history; at least two years of foreign language; and one year of arts such as music, theater, or studio art, and some familiarity with computers.

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 University, which are listed in the "Financial Aid" section of the Catalog.

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 advise freshman, undecided and pre-health profession students. Departmental advisers provide advising for students who have declared their majors. The Student Academic Services staff also represent the College in the University's on-campus recruiting activities and represent the dean in such matters as petitions for extension and correspondence, change of major or college, and student withdrawals. Services also include graduation 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 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.

Responsibility and Assistance. The responsibility for satisfying all requirements for a degree, and for ensuring that a degree plan has been submitted, rests with the student. Advisers assist students in curriculum planning, and students are encouraged to consult fully with their advisers and not restrict their visits to the enrollment periods when only brief meetings may be possible.

Academic Programs

Undergraduate Programs. Requirements for all degree programs and options are detailed in the book Undergraduate Programs and Requirements, available in all Oklahoma colleges and high schools. Separate sheets, stating the requirements for any particular degree, may be obtained on request from the department or college in which the degree is offered.

Bachelor of Arts (B.A.): art, economics, English, French, geography, German, history, journalism and broadcasting, mathematics, music, philosophy, political science, psychology, Russian language and literature, sociology, Spanish, speech (communication consultancy), and theater.

Bachelor of Science (B.S.): aerospace studies, biochemistry, biological sciences, botany, cell and molecular biology, chemistry, computer science, economics, geography, geology, journalism and broadcasting, mathematics, medical
technology, microbiology, military science, physics, physiology, political science, premedical science, psychology, sociology, speech (communication consultancy), speech pathology, statistics, wildlife and fisheries ecology and zoology.

Bachelor of Fine Arts (B.F.A.): art (graphic design and studio).

Bachelor of Music (B.M.): music (elective studies in business; performance); music education (instrumental/vocal certification).

Second Bachelor's Degree. To secure a second bachelor's degree, a student must complete a minimum of 30 semester credit hours in addition to those required for the first degree. The number actually needed depends on what a student must do to satisfy all the requirements for the second degree.

A student seeking a second degree in the College of Arts and Sciences at OSU should ask his or her second adviser to submit a degree plan for the second degree, clearly headred "second degree," and showing how all the requirements of the second degree are to be satisfied. The plan should also state the major, date of award and total credit hours of the first degree, and indicate those courses which represent the minimum of 30 additional hours. The second degree plan should be sent to the College of Arts and Sciences Office of Student Academic Services within two weeks after the student's last enrollment.

Students wishing to complete degrees in two different colleges at OSU should consult with each office of student academic services. Concurrent enrollment in two colleges is possible, but a student must be enrolled in a college for at least two semesters before becoming eligible for a degree from that college.

Second Majors and Minors. If a student majoring in one field also completes the specified requirements for a "major" or a "minor" in other fields, the additional majors or minors may be noted on the student's transcript. Such specified requirements may be obtained from the department in which the second major or minor is sought, or from the Office of Student Academic Services. The student should, at the end of his or her senior year, ask the adviser in the second major or minor to submit the request to the department head and then 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 doctoral degrees available in some. (For details, see the departmental entries below or consult the "Graduate College" section in the Catalog.)

Special Academic Programs

Honors Program. The Arts and Sciences Honors Program is the oldest and largest program of its kind at Oklahoma State University. It provides outstanding students with the opportunity to study, conduct research, and interact with faculty and other honors students in a variety of settings designed to assist talented students who seek to make the most of their educational opportunities. Honors sections of many general education courses allow participating students the benefits of small classes taught by experienced members of the faculty, thus combining the extensive resources of a major comprehensive university with personal faculty attention to each student. Special honors seminars provide coverage of topical issues each semester in formats that 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 with a minimum of 39 honors hours). These awards are reflected 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 (1) an ACT composite score of 27-29 with a high school grade-point average of 3.75 or higher, or (2) an ACT composite score of 30 or higher with a high school GPA of 3.50 or higher. Later entry is permitted on the basis of cumulative grade-point average. Transfer students are eligible on the basis of cumulative grade-point average.

Bachelor of University Studies (B.U.S.). The B.U.S. in the College of Arts and Sciences allows outstanding students with unique educational objectives that cannot be fulfilled by any of the regular degree programs to design an individual plan of study fitted to the student's particular needs. B.U.S. plans must be approved by a faculty committee, the Office of the Dean of the College of Arts and Sciences, and the Office of the Provost and Vice-President for Academic Affairs. At least 45 semester hours must be completed after the plan has been approved.

Area Studies Certificates. International Studies. Students at OSU are encouraged to add an international element 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; and (2) six upper-division courses (18 credit hours) pertinent to the area chosen.

Ancient and Medieval, Native American, and Women's Studies. Certificates in Ancient and Medieval Studies, Native American Studies and Women's Studies are also available. These programs require approximately the same number of credit hours required for a minor in a specific department.

Further information on these certificate programs may be obtained from the Office of the Arts and Sciences Student Academic Services.

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. 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 fields of interest, and should apply for admission to teacher education as soon as possible, preferably before the end of their sophomore year.

It is 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. Premedicine, Pre-osteopathic Medicine, Pre-dentistry, and Pre-veterinary Medicine.

The preprofessional curricula for medical doctors, osteopaths, dentists, podiatrists, optometrists and veterinarians 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 math, chemistry, physics, and biology, 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 freely as any other students in the College of Arts and Sciences. Most students concentrate on some aspect of biology or chemistry, but other subject areas are not only acceptable but welcomed. Medical schools encourage study in the social sciences and humanities that contributes 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) a premedical science degree program which allows a "3 plus 1" approach, requiring at least 97 semester credit hours at OSU and up to 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 premedical and pre-veterinary course requirements are listed in the "College of Veterinary Medicine" and "College of Osteopathic Medicine" sections of the Catalog.

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

Allied Health Professions. The allied health professions for which one can prepare at Oklahoma State University include athletic training, dental hygiene, nursing, occupational therapy, 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 consult 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 Microbiology and Molecular Genetics."

Pre-law Preparation. Law schools have no single preference for a specific undergraduate major. Admission to law school is primarily based upon a strong record achieved in a rigorous undergraduate program and a competitive score on the Law School Admission Test (LSAT). Other admission considerations include course of study and difficulty of curriculum, college activities, and applicant's motivation and personality as revealed in a letter of application.

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 that are particularly critical for success in law school.

Personal assistance in selecting an academic major, planning a solid pre-law curriculum, preparing and registering for the Law School Admissions Test, and applying to law school, is available through the pre-law adviser in the Office of Student Academic Services.

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. At least 40 credit hours of General Education are required for all 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, 1483 or 1493, and POLSC 1113. Six credit hours of English composition is a University requirement, and this must be satisfied by ENGL 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 with permission of their departments.

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, six hours of analytical and quantitative thought, and two hours of General Education elective.
College Requirements. In addition to the 40 hours of general education, the college requires one credit hour of orientation, (A S 1111), for all degrees. For the B.S., nine additional hours of natural or mathematical sciences are required, as well as three additional hours from the humanities or arts. For the B.A., nine additional hours of humanities or arts are required, as well as three additional hours of natural or mathematical sciences and a course focused on non-Western culture. College requirements define the B.A. or B.S. degree in the College of Arts and Sciences.

Foreign Language Proficiency Requirement. The foreign language requirement for the B.A. and B.F.A. in Arts and Sciences may be satisfied by 10 hours of college credit in the same language, or equivalent proficiency demonstrated by passing an advanced standing exam or completing a second-year or higher college-level course in the language. FRNCH and GRMN 3013, 3023, FRNCH and SPAN 4113, RUSS 3123, 4113, and 4223 do not satisfy this requirement.

The foreign language requirement for the B.S. and B.M. degrees may be met by presenting a high school transcript that demonstrates successful completion of two years of study in a single foreign language. It may also be satisfied by any of the three options listed above for the B.A.

The foreign language requirement for the Bachelor of University Studies degree will be determined based on the student's objective, but will be the requirement for either the B.A. or B.S.

Non-Western Requirement (B.A. and B.F.A. only). One three-hour course in Non-Western studies from: A S 3603 (African or Asian studies); ART 4633, 4643; ECON 4643; ENGL 3173; FLL 3500, 3503; GEGO 3753, 3763; HIST 1713, 3013, 3203, 3403, 3413, 3423, 3433, 3980, 4613; JAPAN 2115, 2123, 2223; PHILO 3943; POLSC 3213, 3223, 3253, 3313; REL 3403, 3413, 3533, 3613, 4113, 4400.

International Dimension Requirement (all degrees). One course which fosters 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 that provides 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 all degrees, six hours of general education designated courses (excluding courses in the major prefix) are to be taken at the 3000 level or above.

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.

Hours in One Prefix. If a student seeking a B.A. or B.S. degree takes more than 48 semester credit hours in one subject, including both lower-division and upper-division credit, the hours in excess of 48 will be added to the minimum total of 127 hours required by the College for a bachelor's degree.

This "48 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 in all courses applied toward the degree. A minimum cumulative grade-point average of 2.00, as calculated for graduation purposes, is also required. (See "University Academic Regulations" in the Catalog.)

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 necessitated by 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, and before their last semester, students should 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 in repeated courses (unless officially approved in course descriptions in the Catalog), do not count. ENGL 0123, MATH 0123, and all athletic participation and leisure activity courses are not applicable to a degree. Students must ascertain that grade changes for the removal of "I" 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 prefix, and in major requirements.

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

4. All degree requirements listed above and specified in "University Academic Regulations" and Undergraduate Programs and Requirements must be satisfied.
5. Exemption. A student who believes that he or she has a valid reason for exemption from a College requirement should file with the Office of Student Academic Services a written request that has been approved by his or her adviser. Although general and departmental requirements apply to transfer students, all or most of the student’s previous work may be acceptable as substitutions. Students should consult with 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 Student Affiliate (includes biochemistry)
Angel Flight
Arnold Air Society
Army Blades
Arts Sciences Student Council
Association for Computing Machinery
Dobro Slovo (Slavic languages)
Economics Club
English Club
French Club
Friends of the Forms (philosophy)
Gamma Theta Upsilon (geography)
Geography Club
Geological Society
German Club
Japanese Club
Kappa Kappa Psi (band honor society)
Mathematical Association of America
Music Business Students Association
Music Educators National Conference
Mu Sigma Rho (statistics honor society)
Omicron Delta Epsilon (economics)
OSU Artisans (art club)
OSU National Student Speech-Language-Hearing Association
Pershing Rifles (military science)
Phi Alpha Delta (pre-law)
Phi Alpha Theta (history honor society)
Phi Lambda Upsilon (chemistry honor society)
Phi Mu Alpha (music)
Phi Mu Tau (medical technology)
Pi Mu Epsilon (mathematics honor society)
Pi Sigma Alpha (political science honor society)
Political Science Club
Psi Chi (psychology honor society)
Psychology Club
Public Relations Student Society of America
Russian Club
Scabbard Blade (military science)
Sigma Alpha Iota (music)
Sigma Delta Chi Society of Professional Journalists (journalism)
Sigma Pi Sigma /Society of Physics Students
Sigma Tau Delta (English honor society)
Sociology Club
Spanish Club
Speech Communication Organization
Statistics Club
Tau Beta Sigma (band honor society)
Wildlife Society
Women in Communications

Art

Associate Professor and Head Nancy B. Wilkinson, Ph.D.

The Department of Art provides courses for students interested in: (1) a strong general education background, (2) major concentrations in studio art, graphic design and art history, (3) minors in all three areas.

Two degrees are offered in art: Bachelor of Art (B.A.) with options in studio art and art history and the Bachelor of Fine Arts (B.F.A.), a professional degree with options in studio art or graphic design. Fields of concentration are available in drawing, oil and watercolor painting, printmaking, graphic design, ceramics, jewelry/metalsmithing, sculpture and art history. Because of core curriculum departmental requirements, the freshman and sophomore years are virtually the same for all majors in art.

Students wishing teacher certification should contact the Teacher Education program in the College of Education for their art adviser. Art majors must attain a grade-point average of 2.50 in art courses in order to qualify for licensure and graduation.

The Department of Art maintains an exhibition gallery, the Gardiner Art Gallery in the Bartlett Center for the Studio Arts, with approximately 200 linear feet of exhibition space and 2600 square feet of floor space. Works by artists of national and international reputation, faculty and student works and cultural artifacts are shown. Because of a large endowment, the department is able to offer substantial scholarships at all levels, freshman through senior.

Biochemistry and Molecular Biology

Professor and Head James B. Blair, 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. Major discoveries concerning the biochemistry of genetic material provide the tools of molecular biology that are essential to contemporary life sciences research.

Biochemists and molecular biologists 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 education in mathematics, physics and chemistry.

Challenging positions for well-trained biochemists and molecular biologists 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 and molecular biology administered by the Department of Biochemistry and Molecular Biology is available through the College of Agricultural Sciences and Natural Resources. The department also offers a B.S. degree in biochemistry through 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 and molecular biology curriculum provides students with sufficient background 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 course work, a major part of the program in the Department of Biochemistry and Molecular Biology 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. The results of the three general GRE exams (verbal, quantitative, analytical) are required for entrance. An advanced GRE subject matter exam (biochemistry, chemistry or biology) is also recommended. A cumulative GRE score of 1500 is normally required.

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 the 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, including 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.

A non-thesis Master of Science degree is also available. It does not require a research thesis, but requires a report and extensive technical training in the laboratory. The non-thesis M.S. is not recommended for students wishing to pursue a Ph.D. program later.

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 September of his or her first year. A more comprehensive qualifying examination is also 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.

Botany

Professor and Head James D. Ownby, Ph.D.

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 such as 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, 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, genetics and molecular biology.

Graduate Programs

Programs 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, 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
Chemistry

Regents Professor and Chairman
Lionel M. Raff, Ph.D.

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

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

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

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

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

Graduate Programs

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

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

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

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

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 or physical chemistry. A major in biological chemistry is offered by the Department of Biochemistry. The student must pass a qualifying examination in the student’s field of specialization.

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

The Doctor of Philosophy degree requires the completion of at least 90 semester credit hours of work beyond the bachelor’s degree.

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

Associate Professor and Head Blayne E. Mayfield, 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 three human generations, the computing field has evolved from one associated primarily with engineering and scientific calculations of only casual interest to the layperson, 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 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.

The department offers the full range of degree programs-B.S., M.S. and Ph.D. For individuals interested in teaching computer science at a two- or four-year institution, an Ed.D. program is also available.

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 3090-200S, a VAX, and a DEC 5000-240 RISC. The department has a Sequent Symmetry S81 computer which is UNIX based. There are also several NCD X-Terminals with windowing graphics displays that are available for some classes.

Computers can be accessed through the University Computer Center Network. Computer terminals are available in various buildings on campus. Some of the residence halls also have terminals available. Both the University and departmental computers can be accessed through the network. Computers are available 24 hours a day for at least six days a week.

The department participates in the CSNET and USENIX 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, a student must take sufficient courses in one specialized area. In addition to coursework, 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 an area 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 put concepts and ideas learned to practical use.

For a master's degree, 30 hours of graduate credit, including a six-credit-hour thesis, are required. A master's degree student is required to pass an oral examination over the thesis. There is no 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 700 students graduate each year in the United States with Ph.D.'s in computer science. In general, both 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 with some procedure-oriented programming language such as C, FORTRAN, or PASCAL; (4) qualifying grade-point average and Graduate Record Examination scores.

Economics and Legal Studies in Business

Professor and Head Joseph M. Jadlow, 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 people'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-both national and international. It provides an excellent
background for the study of law and international relations. 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 through the College of Business Administration to provide additional training in analytical methods and communication skill for both public and private sector occupations.

Graduate Programs

The department offers work leading to the Master of Science degree and the Doctor of Philosophy degree. The graduate program in economics prepares economists for academic careers as well as research and administrative positions in business and government agencies.

Graduate fields of specialization include monetary economics, public finance, international economics, economic development, econometrics, labor and human resource economics, industrial organization, and urban and regional economics. In addition, graduate courses are offered in the history of economic thought and in mathematical economics.

The initial admission to a graduate program 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 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.

English

Associate Professor and Head Jeffrey Walker, Ph.D.

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

The 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 25.

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-novel, film, short 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. Some students are finding that an English major is excellent preparation for law school because it develops the analytical and language skills lawyers use. But one need not have definite 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 that they choose a second major or minor in English.

A Bachelor of Arts in English requires 39 hours of lower- and upper-division English courses. An English minor requires 18 hours of English, at least 9 of which must be upper-division. (These hours do not include Freshman Composition.)

**Graduate Programs**

Graduate study in English at Oklahoma State University allows students freedom of choice. Only one course, Introduction to Graduate Studies, is required of all graduate students, and only one additional course, Teaching Freshman Composition, 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.

**Application Deadlines.** The deadline for spring admission is October 15. The deadline for fall admission is February 28.

**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. Examinations.** During the last semester of course work—but no earlier—graduate students must take Exam A. Students in TESL and technical writing students will take the exams designed specifically for those areas.

Exam A. This five-hour exam is administered on a single day. The exam contains three essay questions in each of the 10 areas of study, from which the student will answer four questions. Exam A, therefore, presents students with 30 questions, three from each of the 10 areas. The areas of study are:

1. British literature Old English to 1660 (including Milton)
2. British literature Restoration through 19th century
3. American literature colonial through 19th century
4. Twentieth-century British and American literature
5. Literary theory and criticism
6. Linguistics
7. Composition and rhetoric
8. Film
9. Technical writing
10. Teaching English as a second language (TESL)

Questions in technical writing and TESL on Exam A are general; they are not designed for technical writing and TESL students seeking the M.A., who take different exams.

**TESL Program Exam.** Students in the TESL program will take two five-hour exams:

1. TESL methodology/testing
2. Applied linguistics/grammar

**Technical Writing Program Exam.** Students in technical writing will take one five-hour exam. They will answer four questions from the following three areas:

1. Technical writing theory
2. History of scientific and technical writing
3. Document design

**Ph.D. Examinations.** After the appropriate amount of course work and prior to beginning the dissertation, the student must take and pass Exam B.

Exam B. Exam B will consist of two five-hour exams. The student, in consultation with the advisory committee, will select the two areas on which he or she will be examined. These two areas will be chosen from the following:

1. Early American literature
2. Nineteenth-century American literature
3. Old and Middle English literature
4. Renaissance British literature (including Milton)
5. Restoration and eighteenth century British literature
6. Nineteenth-century British literature
7. Modern British and American literature
8. Contemporary British and American literature
9. Literary theory and criticism
10. Practical poetics and fictional rhetoric

11. Film
12. Composition and rhetoric
13. Linguistics
14. Technical writing
15. Teaching English as a second language

Details on Exam A and Exam B are found in the departmental Guidelines.

**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 must have a minimum of 24 hours of undergraduate English courses. 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.

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, international 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 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.

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.

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), a statement of purpose, a writing sample, 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 or mastery of one foreign language is required of the doctoral student. 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 filmscripts), 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

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 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 a high school or equivalent foreign language experience will be placed at levels commensurate with their individual proficiency. A major in a foreign language is often supported by study of another language or work in other fields. Many language majors choose to qualify for an International Studies certificate. Several certificates, such as Asian, Latin American, Russian and Eastern European Studies and Ancient and Medieval Studies, are available. A freshman with a good high school background in language can usually pursue two languages to the level of a major.

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

Additional options for study include literature, civilization and culture, and linguistics courses regularly taught in English. Courses are also offered in Ger-
regional contexts. These analyses occur at many levels-world-wide, national and local. These kinds of studies lead to suggestions for change and improvement—the application of geography to contemporary rural, urban and regional problems. Thus many aspects of urban, regional and national planning are geographic in nature.

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

Those who wish to study geography tend to be interested in their own surroundings and in other places. They also possess a curiosity for maps, the basic tool of the field. Students of geography will become familiar with remote sensing, computer graphics, statistics, 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 sector, resource planning and management, various forms of domestic and foreign service, cartography and teaching. Geography also provides an excellent foundation for a liberal education and is a good basis for a career in business, industry or government.

The department possesses a cartographic laboratory, the Center for Applications of Remote Sensing, a computer mapping facility, field mapping equipment such as global positioning system receivers, 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, geographic techniques, and the geography of 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. This degree program emphasizes preparation for employment in positions which are enhanced by an ability to recognize and to interpret spatial distribution, and to analyze regions.

Particular emphasis is placed on the applied aspects of geography, with many graduates employed by 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 the geography of sports, recreation and leisure.

School of Geology

Regents Professor and Head Zuhair F. Al-Shaieb, Ph.D.

Geology is concerned with the processes, the history, and the characteristics of the rocks and sediments which shape the Earth. Human activities, predominantly on or near the surface, have utilized rocks and products stored in rocks, mainly petroleum and metals, to contribute to the quality of life. Because the Earth is dynamic—that is, the land surface is constantly changing—knowledge of earthquakes, volcanoes, plate tectonics, floods and landslides, to name a few dynamic events, is critical to minimize human suffering and economic loss. Within geology, different specialties, such as petroleum geology, ground-water geology (hydrogeology), geomorphology (study of surface processes), structural geology, and paleontology (study of fossils), have developed.

Success in geology is linked to other sciences that contribute to the techniques used by geologists to understand the Earth. Information acquired from basic courses in chemistry, physics, mathematics, and, to a lesser degree, statistics and computer science, is utilized by the geologist in his or her quest for new knowledge about the Earth. Such broad, course work provides geologists with many career options.

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 in a college or university and in research are open only to those with graduate training.

Graduate Programs

Prerequisites. The student should have at least 39 credit hours in geology. Additional undergraduate requirements to enter the master’s degree program include: nine credit hours of chemistry, eight credit hours of physics, four credit hours of zoology or botany, 10 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 recommended, but not required for admission to the program.

The Master of Science Degree. Emphasis in the master’s degree program is placed on applied geology including hydrogeology, environmental geology, sedimentary/petroleum geology, paleontology, and structural geology.
History

Associate Professor and Head Ronald A. Petrin, 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 self 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, 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, students may substitute one field in history with a field in a related discipline. Students must take at least six hours in the related discipline. The specific courses used to comprise this field must be taken at the graduate level and have the approval of that member of the advisory committee representing the related discipline.

Fields of study include:

Ancient Mediterranean world

Medieval Europe

Early modern Europe to 1789

Europe since 1789

East Asia

England

Latin America

Russia

United States to 1877

United States since 1877

Students must demonstrate satisfactory reading knowledge of one foreign language.

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.) The 36 hours must also 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). The creative component requirement is satisfied by the course HIST 6120, Special Studies in History. At least six hours of the course work must be in United States history and at least six hours in non-United States history. With the approval of the student's advisory committee, as many as nine of these hours may be taken in related disciplines.

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-point 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, 1877-1877
   - 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
   - East Asia
   - England
   - Latin America
   - Russia
4. With the consent of the advisory committee, students 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, one of which must be United States history:
   - Ancient Mediterranean world
   - Medieval Europe
   - Early modern Europe to 1789
   - Europe since 1789
   - East Asia
   - England
   - Latin America
   - Russia
   - United States
2. With the consent of their advisory committee, students may substitute for one of the 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 candidacy, the student begins work on the dissertation. Supervised by the major adviser and members of the advisory committee, the dissertation provides the student an opportunity to do original research on a topic within the major area of study. The final dissertation must be submitted to the Graduate College in accordance with the regulations contained in the “Graduate College” section of the Catalog. Upon completion of the dissertation, the student undergoes a final examination. Oral in nature and no more than two hours in length, the examination is primarily a defense of the dissertation.

No student is admitted to candidacy until he or she has (1) demonstrated a reading knowledge in at least one foreign language; (2) completed all course work on the plan of study; (3) completed with a “B” grade graduate courses in historical methods and historiography; (4) obtained approval of a proposed dissertation topic; and (5) passed comprehensive written and oral examinations in each of the areas of concentration.

Upon admission to candidacy, the student begins work on the dissertation. Supervised by the major adviser and members of the advisory committee, the dissertation provides the student an opportunity to do original research on a topic within the major area of study. The final dissertation must be submitted to the Graduate College in accordance with the regulations contained in the “Graduate College” section of the Catalog. Upon completion of the dissertation, the student undergoes a final examination. Oral in nature and no more than two hours in length, the examination is primarily a defense of the dissertation.

School of Journalism and Broadcasting

Professor and Director Marian D. Nelson, BID.

At Oklahoma State University, the professional areas of mass communication are grouped in the School of Journalism and Broadcasting (SJB). These areas seek to complement each other with a minimum of duplication.

A modern democratic society cannot live by its ideals if its mass media practitioners are merely competent technicians who worry less about what is reported to the people than how it is reported. Citizens must have accurate information about social, political and economic problems as well as knowledge of actions taken by government agencies at all levels. From village council to Supreme Court, there can be no exception from the rule that public business is the public’s business.

To speak to people through radio, television or the printed page requires a knowledge of the people to whom one wishes to speak and an understanding of the world in which they live. Therefore, the curricula of the School of Journalism and Broadcasting are designed to offer more than training in communication techniques. Three-quarters of the SJB student’s time at the University is devoted to a liberal education in the arts and sciences. At the same time, the student gains competence in a professional field through courses in the SJB.

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 media leadership and assistance in extension and public service through high school and college educators and professional communication associations.
5. To emphasize high standards of ethics and responsibility in mass communication.

Accreditation

The undergraduate programs of study in the School of Journalism and Broadcasting are accredited by the Accrediting Council on Education in Journalism and 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 the course Media
Style and Structure (JB 1393). 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.

Advertising and Sales

Ideas ranging from the introduction of new products and services to public service messages are communicated to mass audiences through advertising. Advertising also provides the economic base for mass media-newspapers, radio and television, magazines, cable—thus freeing them from the political control found in many countries.

Upon a strong liberal arts foundation, majors in advertising build educational experiences which prepare them for work in copywriting and layout, production, management, media selection, market analysis, sales and campaign planning. Basically, the program focuses on decision-making and problem-solving, and includes courses in marketing, psychology, sociology, management and economics. Opportunities for part-time jobs, summer internships and participation in the Advertising Club round out the student's experience.

The program is also designed for students who wish to write, sell and produce commercial messages, and to move into management or ownership positions on radio and television stations.

The program is affiliated with the American Association of Advertising Agencies, the Advertising Federation of America and the Point of Purchase Advertising Institute.

Journalism

News coverage today has gone beyond routine reporting on police and city hall activities. The modern newspaper or broadcasting station tries to spotlight the diverse components of our complex society. This objective calls for writers with broad interests and special knowledge in politics, religion, science, business, economics, art and public welfare. From the ranks of these reporters come the future print and broadcast journalists.

Programs offered in journalism are:

News-editorial. This program prepares students for writing and editing positions on newspapers, magazines, and trade journals, in radio and television news departments, and in book editing and publishing.

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 Agricultural Sciences and Natural Resources and Human Environmental Sciences.

Community journalism. This program, for those who plan eventually to own or manage weekly or small daily newspapers, requires experience in news, advertising and management, and thus requires a wide range of courses both within and outside the School of Journalism and Broadcasting. This program is an individualized one and should be entered only with the advice and consent of the SJB director.

Journalism majors assist in the publishing of a campus newspaper, The Daily O’Collegian, in the newsroom of radio station KOSU, and in audio and video news programming cablecast over a local cable station. 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 Daily O’Collegian or other publications.

The journalism program is affiliated with the Oklahoma Press Association, Southwest Journalism Congress, Society of Professional Journalists, and the Association for Education in Journalism and Mass Communications.

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 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

The programs in radio-television 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 the professional option broadcast journalism. It is intended for students who wish to write, edit and produce news, discussion and documentary programs for broadcasting stations, networks and cable companies.

The facilities of the University's color-equipped Telecommunications Center, a full-time radio station, KOSU, an electronic news-gathering laboratory (ENG), and access to a channel on local television, make it possible for majors to acquire experience along with professional studies. Radio-television is affiliated with the National Association of Broadcasters, Radio Advertising Bureau, Oklahoma Association of Broadcaster s, Oklahoma Broadcast Education Association, National Association of Broadcasters, Broadcast Education Association and National Public Radio.

Graduate Programs

The School of Journalism and Broadcasting offers courses leading to the degree of Master of Science in mass communication. The School also cooperates with the College of Education in planning and supervising study leading to a Doctor of Education degree with emphasis in mass communication.

Prerequisites for unqualified admission to the master's program include a bachelor's degree in an area of mass communication with an overall grade-point average of 3.00. The Graduate Record Exam (GRE) is required. Potential doctoral candidates must have a
bachelor's or master's degree in a mass communication area, in addition to professional experience. Graduates of a non-mass communication discipline may enter the Master of Science program, with the stipulation that they complete, without graduate credit, foundation courses relevant to career interests before they take graduate courses.

Basic emphasis is on application of current communication theories and research methods and designs to the professional aspects of mass communication. Electives in the behavioral sciences are encouraged.

Mathematics

Professor and Head J. Brian Conrey, 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, do research and teach at universities, and work in industry and government. In industry mathematicians usually work in research, although they have become increasingly involved in management. Firms employing large numbers of mathematicians are in the aerospace, communications, computer, defense, electronics, energy, and insurance 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.

An undergraduate specializing in mathematics will begin with calculus or sometimes with college algebra and trigonometry. Well-prepared students are encouraged to establish credit in elementary courses by passing advanced standing examinations. All majors take courses in differential equations, and linear and modern algebra. 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. For example, university teaching requires a Ph.D., while 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 correct 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. The department offers two Master of Science degrees, one in mathematics and one in applied mathematics. Each degree requires 32 credit hours of graduate course work in mathematics or related subjects. Two of these hours are waived if a master's thesis is written. Each student must pass a comprehensive exam on the basic graduate courses of his or her program.

The Doctor of Philosophy Degree. Admission to the Ph.D. program is granted only to students with superior records in their previous graduate or undergraduate 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.

The Doctor of Education Degree. The department supervises an Ed.D. program which is run in conjunction with the Department of Higher Education and Administration. Course requirements are similar to those for the Ph.D., except that 12 credit hours are required in educational theory. No language exam is required. An expository thesis can be accepted.

Microbiology and Molecular Genetics

Professor and Head Robert V. Miller, Ph.D.

Microbiology

Microbiology is the study of bacteria, viruses and fungi and their many relationships to humans, animals and plants. Microbiologists apply their knowledge to public health and sanitation, food production and preservation, industrial fermentations which produce chemicals, drugs, antibiotics, alcoholic beverages and various food products, prevention and cure of diseases of plants, animals and humans, biodegradation of toxic chemicals and other materials present in the environment, insect pathology, and other activities which seek to control microbes, to enhance their useful activities and prevent those which are harmful. Microbiology also is the basis for the exciting and expanding new field of biotechnology which endeavors to utilize living organisms to solve important problems in medicine, agriculture and environmental science.

Microbes are also studied as living in a great variety of environments and carrying out many of the processes found in higher organisms. They are thus interesting in their own right as model systems for the study of reactions which occur in higher organisms. As subjects for research in biochemical and molecular genetics, microbes have contributed
most to the current knowledge of genetics at the molecular level (microbial systems are in the forefront of genetics engineering).

Opportunities for employment exist at all scholarly levels, in many local, state and national government agencies and in varied industries. The record for employment of microbiologists has been excellent for many years and with the increased interest in biotechnology, employment opportunities look even brighter for the future. It is estimated that between 35,000 and 50,000 new jobs in biotechnology will be created during the next five years in the San Francisco area alone, and in the Boston area approximately 20,000 individuals trained in biotechnology will be in demand.

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.

Graduate Programs

Graduate programs are designed to provide comprehensive training and the skills required for work 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.

Cell and Molecular Biology

Cell and molecular biology is the study of how cellular components interact to promote life processes. It includes the study of how DNA and RNA are synthesized, how genes are expressed to allow differentiation of a single-celled egg into a complex multicellular organism. Cell and molecular biologists study protein synthesis, cell ultrastructure, organelle structure and function, enzymology, and the collection of concepts and procedures commonly known as "biotechnology" or "genetic engineering."

With the advent of modern molecular biology, the study of cellular components is essential to molecular biology. The cell and molecular biology major at Oklahoma State University has been designed to allow students to acquire training in a multidisciplinary atmosphere that prepares them for employment in the rapidly growing field of biotechnology. Students following this avenue of study will be well prepared to continue toward the M.S. or Ph.D. degrees at this or other institutions or to find employment directly upon graduation.

Opportunities for employment exist at all scholarly levels, in many local, state and national government agencies and in varied industries. The record for employment of microbiologists has been excellent for many years and with the increased interest in biotechnology, employment opportunities look even brighter for the future. It is estimated that between 35,000 and 50,000 new jobs in biotechnology will be created during the next five years in the San Francisco area alone, and in the Boston area approximately 20,000 individuals trained in biotechnology will be in demand.

These fields require a solid knowledge of other sciences and students should take high school courses in mathematics, biology, chemistry and physics. Students should have broad interests in how living cells work and have aptitudes for biology and chemistry.

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 approves 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 in attaining 30 credit hours with thesis. The plan of study must include six credit hours in MICRO 5160 and one credit hour in MICRO 5160.

The Doctor of Philosophy Degree. The study plan of a student entering the program with a bachelor's degree must include 30 credit hours in courses other than MICRO 5000 and MICRO 6000. Those entering with a master's degree must include 15 hours in courses other than MICRO 6000 which were not included in the master's study plan. Three hours of MICRO 5160 must be included.

Candidates for the Ph.D. degree must pass all a written and an oral qualifying examination. The final examination covering the dissertation research is given promptly after the candidate has given a public seminar on his or her research work.

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.
- Muskogee General Hospital, Muskogee, Okla.
- St. Anthony's Hospital, Oklahoma City, Okla.
- St. Francis Hospital, Tulsa, Okla.
- St. Mary's Hospital, Enid, Okla.
- University Hospital, Oklahoma City, 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 18 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 biochemistry; immunology, genetics, anatomy and physiology, and two upper-division courses in microbiology; 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 requirement sheet in the Undergraduate Programs and Requirements.

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

Applications and Admission to Internship. Students should apply directly to one or more schools of medical technology about 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.

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 $150.00 per month subsistence allowance. Applications for four-year scholarships may be obtained through local high school principals or advisers and the ROTC departments. Information concerning three-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 Interim Head Major Roger A. Shuman, M.S.

The Air Force ROTC basic program consists of one classroom hour and one leadership laboratory period per week for one credit hour per semester during the freshman and sophomore years. The advanced AFROTC program (junior and senior years) is open on a competitive basis to any student having two years of enrollment remaining. The advanced courses each include three classroom hours per week and one hour of leadership laboratory for three semester hours of credit. Class work and laboratory involvement are designed to prepare the student for his or her future role as a leader in the U.S. Air Force. No military obligation is incurred for non-scholarship students enrolling in the freshman and sophomore courses. Students in the advanced program must successfully complete at least three hours of English composition and a mathematics reasoning course.

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 six to nine years, commencing with completion of flight training. Nonflying officers have a four-year commitment.

Military Science

Professor of Military Science and Head LTC William J. McLean, M.B.A., M.A.

Students desiring to expand the scope of their education, while preparing for a dynamic and rewarding career as an
advanced course consists of 12 hours of 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 across the nation.

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 10 hours of military science with no commitment to the United States Army. During this basic course, emphasis is placed upon leadership, war gaming, individual skills, problem solving, rappelling, and land navigation. All lower-division ROTC courses are open to the entire University community regardless of year in school.

Students committing themselves to a commission in the United States Army are permitted to enroll in the Army ROTC advanced course upon completion of the basic course or equivalent. The advanced course consists of 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 military 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.

Students 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 three-year scholarships are available through the department. Prior enrollment in military science is not a prerequisite for departmental scholarship application.

Music

Associate Professor and Head William L. Ballenger, M.A.

The music program at OSU serves students who plan careers in the field of music as well as those who desire to participate in any element of a comprehensive music program. Professional instruction prepares students for careers in performance, teaching, or the music industry. The OSU undergraduate degrees are also excellent preparation for graduate school and for church positions.

The student planning to major in music at the university level should consider his or her background carefully. It should include a strong interest in music during high school years and a talent for performance in vocal or instrumental music. Individual lessons, fundamental theory knowledge, and basic piano ability will also be helpful.

The music major may choose from the following degrees: (1) Bachelor of Music (B.M.) in performance, (2) B.M. in instrumental/vocal music education, (3) B.M. with elective studies in business, and (4) Bachelor of Arts (B.A.) in music. In addition, the Bachelor of University Studies allows the student to combine an interest in music with another 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.

Philosophy

Professor and 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. The B.A. program in philosophy has been approved for offering at the University Center at Tulsa.

Students may pursue work in philosophy as part of their general education, as a support to their major area of concentration, as a minor, as a major leading to a B.A. degree, as a second major or in connection with a graduate program. Philosophy majors have an excellent educational base from which to pursue careers in teaching, the ministry, law, government service and private business of many sorts. They have available to them one of the most flexible programs offered at the University, for 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 37 hours of related and elective study in other areas, in addition to General Education and other college requirements. 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. Consult the "Master's Degree Programs" section of the "Graduate Catalog" for regular regulations and requirements relating to admission.

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 wish to expand their field of professional competence; and to college graduates who wish to broaden their own educational horizons. The M.A. program in philosophy has been approved for offering at the University Center at Tulsa.

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 10 three-credit-hour courses and a two-credit-hour report); and with neither a 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 3113 and 3213 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.

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 every case, this examination will be arranged, administered, and supervised by the three-person advisory committee appointed for, and in consultation with, each student during the student's second semester of enrollment. This committee will also be responsible for determining the student's plan of study, thesis or report topics, if any, and any other special requirements that may need to be fulfilled.

**Master of Arts in Philosophy, with thesis:**
1. 24 hours of course work in classes and seminars approved by the student's advisory committee.
2. Six 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, with report**
1. 30 hours of course work in classes and seminars approved by the student's advisory committee.
2. Two hours of PHILO 5910, in which two research papers will be prepared.

These papers typically will have their origin in graduate seminars taken as part of the plan of study.

3. An oral examination and defense of the reports will be required in a formal presentation to the departmental faculty.

**Master of Arts in Philosophy, without thesis or report:**
- 36 hours of course work in classes and seminars approved by the student's advisory committee.
- A student may also, in accordance with the policies of the Graduate College, select a graduate minor in connection with any of the three programs, thus permitting a concentration of work in broad areas such as social thought, cognitive science, or religion.

Under the auspices of the Department of Educational Administration and Higher Education (EHAD) 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. General requirements concerning the Ed.D. in higher education are listed in the "Doctor of Education” and "Educational Administration and Higher Education” sections of the Catalog. 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.

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**Physics**

Professor and Head H. Larry Scott, Ph.D.

In today's technological society, professionals in many diverse fields need to possess critical skills of observation and quantitative evaluation. Increasingly, persons trained in physics can be found in career positions in finance, medicine, business and many other fields where analytical skills are now a necessity for competitive survival. The program in physics at OSU is aimed at developing these skills in both experimental and theoretical settings. Curriculum plans are available for degrees in fundamental physics, or in applied programs that combine physics with biology, business, computer science, engineering, mathematics or premedicine.

During the first two years, the physics program provides a basic, quantitative and intuitive understanding of the physical world, from the classical ideas of Newton and Maxwell to the modern relativistic and quantum laws of Einstein and Schrodinger. At the same time, mathematics and computer skills are developed in application to physical problems. After two years, a student in the physics program may elect to pursue more advanced courses in theoretical and experimental physics, leading to a B.S. degree in physics and graduate studies in physics, or a related field. Alternatively, the student may elect to replace certain upper-division physics courses with upper-division courses in one of the above mentioned fields, leading to a B.S. degree in applied physics, biology, business, computer science, engineering, mathematics, or premedicine.
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 coursework, and mathematics courses through advanced calculus and 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: PHYSC 5113, 5313, 5413, 5453, 5613. In addition, nine semester credit hours of electives must be completed in physics, mathematics, or an allied field. These must be chosen in consultation with the student’s 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 PHYSC 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 “Graduate College” section of the Catalog, 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: PHYSC 5213, 5313, 5413, 5453, 5613, 6313. Four additional PHYSC prefix courses at the 5000 or 6000 level, including at least one course not in the student’s specialization, must be completed. Additional courses reflecting the candidate’s specialization may be required by the advisory committee. Ninety semester hours of credit beyond the bachelor’s degree are required. 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 Head William Parle, Ph.D.

Political science is the study of politics, government and public policy at the local, state, national and international levels. It is concerned with struggles for power and the exercise of power in the form of institutions, laws and public policies.

Political science seeks to reveal the patterns of behavior associated with politics, to discern the decision-making process in government, to explain the functioning of political and governmental institutions, to appraise alternative public policies and to assess government’s role in society. The principal fields of study in political science are political theory, public law, comparative politics, international relations, public administration, public policy, and American political behavior. Students may receive the Bachelor of Arts or Bachelor of Science degree in political science with a concentration in any of the fields of study.

Political science graduates enjoy a variety of career opportunities—staff positions with international, federal, state and local government agencies; teaching positions in college and high school; policy analysis and research positions with governments, businesses, civic and related fields; 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 policy analysis. 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 for 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 of 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 nonpolitical 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 (master's 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."

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**Psychology**

**Associate Professor and Head David G. Thomas, Ph.D.**

The student pursuing a B.A. or B.S in psychology is provided with a background which can be of great value in dealing with the personal, social and vocational areas of his or her life. The course of study applies the scientific method to the study of the behavior of an individual and behavior between individuals. The understanding of such material can be directly related to functioning in a job or career.

A bachelor's degree in psychology is useful in a wide number of occupations in business, education and industry. The range of positions obtained by graduates covers almost all occupations requiring direct personal contact with other people. Some examples are supervision, training, sales, public relations and interviewing. Also included are positions with city, state and federal agencies, and in applied research. Although there is no license or certificate to teach psychology in the schools, it is possible to get a teaching certificate or licensure in social studies education with endorsement in psychology while pursuing a major in psychology. Persons interested in such teaching should contact the Office of Teacher Education. (See "Teacher Education Programs" in the "College of Education" section of the Catalog.)

**Graduate Programs**

Employment in the professional field of psychology requires a graduate degree. Psychologists with advanced degrees have exclusive claim to some professional positions.

The Department of Psychology offers two programs of study leading to the degree of Doctor of Philosophy, one in clinical psychology and one in experimental psychology. Students applying for the doctoral degree should have the following prerequisites: introductory psychology, quantitative psychology, physiological psychology, experimental psychology, history, and systems.

Students in the doctoral program first work toward a Master of Science degree. In addition to meeting the general requirements of the Graduate College, for completion of the Master of Science, students must also:

1. Complete four core courses and two semesters of quantitative psychology along with other course credits totaling 30 credit hours.
2. Complete a thesis project, supervised and reviewed by appropriate faculty members.

Following the completion of the first-year requirements, the student may be admitted to doctoral status in clinical psychology or experimental psychology.

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**Religious Studies**

**Associate Professor Richard C. Rohrs, 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 promote a particular view. Emphasis is 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 require-

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**Sociology**

**Associate Professor and Head Patricia A. Bell, Ph.D.**

Sociology is the scientific study of human society and social behavior. As such, sociologists study a broad array of social phenomena ranging from the dynamics of social interaction to the composition and workings of entire societies.

Many different points of view are represented in the areas of expertise of the departmental faculty. The diversity of the faculty is reflected in many different types of courses offered. Topics include community organization, criminology and corrections, gerontology, social problems and deviance, social ecology and population studies, social psychology, industry and work, and rural sociology. The department also offers courses in anthropology, race and ethnicity, and gender issues. The department emphasizes pure as well as applied research. Many undergraduate majors elect to have supervised work-related internship experiences in work settings of their choosing.

Course offerings in anthropology provide students with a basic introduction to concepts and principles of physical anthropology, archeology and cultural anthropology. Regular course offerings include an emphasis on North American Indian cultures and archaeology. Other courses deal with anthropological methods and theory.

The Department of Sociology offers B.A. and B.S. degrees in general sociology and applied sociology. The general sociology degree provides students the opportunity to obtain a strong liberal arts degree with a maximum number of electives, and provides a good base for pursuing a professional or graduate degree in sociology and in several other fields of study. The applied options provide practical experience for work in research and data analysis, the helping professions, and fields dealing with social problems.

**Graduate Programs**

The Department of Sociology offers the Master of Science and Doctor of Philosophy degrees. Programs are designed to prepare students for appointments to the faculties of colleges and universities, to work in private industry and in social service agencies, and for research positions in business and government. The department offers concentrations in com-
speech communication. Students are afforded an opportunity to gain practical experience in interpersonal and public communication.

In speech communication, students are prepared for positions in industry and business and are qualified to work with interpersonal communication problems. Graduate work in this area increases the student's career opportunities in the field of communication consulting. In addition, the department's concern with related areas, such as sociology, business and psychology, allows the admission of graduate students with undergraduate preparation in some of these fields.

Graduate Programs

Prerequisites. To enter the program, the student should have a minimum of 12 semester credit hours of undergraduate courses in speech communication or the equivalent.

Admission Requirements. Applicants normally should have at least a "B" grade-point average at the undergraduate level and strong recommendations from those familiar with the student's previous academic background. Beyond that, the number of students admitted will depend on the number of places available in the program.

Program Requirements. The complexity of today's society requires an individual capable of solving a wide range of problems. In order to meet this need, the speech communication graduate program aims at producing: (1) individuals capable of fulfilling the role of a communication consultant or interventionist within governmental, business and industrial, public service, educational and community organizations; (2) individuals capable of using methods and procedures of the behavioral sciences in investigating and solving practical as well as theoretical problems in communication; (3) individuals with the background to pursue doctoral programs in communication; and (4) competent teachers of communication for two-year and four-year colleges as well as the common schools.

The student may earn the Master of Arts degree under one of the following plans:

Plan I-A minimum of 24 semester hours of speech communication courses and a thesis for which six credit hours is earned.

Plan II-A minimum of 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

Professor and Head Cheryl Scott, Ph.D.

The Department of Speech and Language Pathology and Audiology prepares students through the master's level to serve individuals of all ages who exhibit speech, language, cognitive 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 course work and clinical observation experiences in the nature, symptoms and treatment of those who possess various kinds of communication disorders. Acceptance into the undergraduate program is considered on a grade-point average for 36 or more hours attempted.

The master's level program in speech-language pathology 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 externship 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 in Speech-Language Pathology 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 in speech-language pathology.

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. Interviews are conducted prior to admission. Students with a baccalaureate degree are required to be admitted to a graduate degree program to take course work in this department. Application deadlines can be obtained from the department.

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 students have readily intelligible spoken English, because they will be conducting therapy sessions in English. International students are eligible to apply for graduate assistantships which also qualify them for in-state tuition. The International Student Services Office is available on campus to assist international students.

Program Requirements. The program leading to the Master of Arts in speech-language pathology 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 externship for at least eight weeks at 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-language pathology.

The degree consists of a minimum of 29 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 externship for which the student may receive up to six semester credit hours.

Examinations. Students must pass comprehensive examinations before graduation. Students preparing a thesis 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 externship which critically evaluates the experience.

Nontraditional Students. Part-time graduate study is encouraged. Courses are scheduled conveniently in the evenings and during the summer term to accommodate nontraditional students who commute to campus. Students holding undergraduate degrees in other fields are encouraged to apply for admission. Undergraduate prerequisites will add approximately 37 credit hours to the program.

Statistics

Professor and Head P. Larry Claypool, Ph.D.

Statistics is the science of learning from data. It is concerned with the development of theory and with the application of that theory to the collection, analysis and interpretation of quantitative information.

Because statistics is important in many scholarly disciplines, a degree in statistics provides the opportunity to enter not only the statistics profession but also many other fields which make extensive use of statistics. The areas of application include agriculture, the biological sciences, engineering, the physical sciences, the social sciences, education, business and home economics, among others. Statistics also promises to be important in emerging endeavors such as pollution and environmental research, energy utilization and health-care administration.

Those who pursue the study of statistics should be interested in scientific inquiry and should have a good mathematical background. In addition it is desirable that they have a genuine interest in some other subject which uses statistics.

Careers in government, industry and education, involving the disciplines previously mentioned, are open to the statistics graduate. In government and industry a statistician usually serves as a researcher or as a consultant to research scientists and decision-makers. In education, of course, the teaching function is
added to those of research and consulta-
tion. In almost all careers, the statistician
uses the computer.

The Statistical Laboratory operates
within the department to provide statisti-
cal consulting to researchers—both
faculty and student—across the campus.

The Department of Statistics offers the
B.S. and M.S. degrees to those interested
in applications of statistics, and the Ph.D.
degree to those who wish to make origi-
nal contributions to the theory of statis-
tics.

Graduate Programs
Admission Requirements. It is neces-
sary to have an undergraduate degree,
not necessarily in statistics or mathemat-
ics, 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 an-
other 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 2145, 2155, 2233,
3013, 4013). Students admitted to the
program with deficiencies will be re-
quired 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 of the Catalog. Normally,
the all-course work plan will be initiated at
the suggestion of the faculty. Each stu-
dent will be required to attain an intro-
ductory knowledge of some field of appli-
cation 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 stu-
dent 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 intro-
ductory knowledge of some field of appli-
cation 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 proce-
dure-oriented language such as FOR-
TRAN.

Theater
Professor and Head Jerry L. Davis,
Ph.D.

The program in theater provides
course work and practical experience in
all areas. The degree programs are
broadly based with academic, humanis-
tic and artistic approaches to the subject
matter. Training typically involves not
only the most obviously theatrical disciplines
such as acting, but also extensive techni-
cal skills, literary and historical knowl-
edge, artistic expression, and self-disci-
pline.

Study of theater can lead to many
careers besides those in the performing
arts. Fields where theater study can be
especially helpful include business man-
agement, sales, law, politics, teaching,
counseling, ministerial professions, or
any career area where self-awareness
and effective personal communication
are essential.

Ambitious seasons of varied produc-
tions offer practical experience for both
majors and nonmajors.

Students with a major interest in theater
choose a Bachelor of Arts degree. A
strong component of theater courses
may also be included in the individual-
ized 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 con-
siderable 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 back-
ground 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" section of the Cata-
log.

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.

Zoology
Professor and Head Jerry Wilm, Ph.D.

The Department of Zoology offers B.S.
degree programs in biological science,
physiology, wildlife and fisheries ecology,
and zoology.

The degree in biological science is
available for students wishing to obtain a
broad program encompassing all of the
life sciences. By including appropriate
course work, students can obtain
licensure to teach in the secondary
schools. Requirements for admission to
dental, medical and other health-related
professional schools can be met through
the biomedical option of the biological
science degree.

The undergraduate degree in physiol-
ogy is intended primarily as preparation
for graduate school or a medically-re-
lated professional school. With its rela-
tively large number of free electives, the
B.S. degree in physiology is also an
excellent liberal arts experience. The
bachelor's degree in physiology requires
participation in undergraduate seminars
and upper-division course work in gen-
eral biology, genetics, gross and micro-
scopic anatomy, mammalian and cellular
physiology, mathematics, pharmacology,
physics, and chemistry.

The wildlife and fisheries ecology un-
dergraduate program involves com-
prehensive study in the conservation of
renewable natural resources, with an
emphasis on the optimum balance be-
tween wild animal populations and habi-
tat requirements. Courses in the wildlife
and fisheries program fulfill the require-
ments for many other applied and profes-
sional careers in wildlife ecology, includ-
ing preparation for graduate programs.
Undergraduates majoring in wildlife and
fisheries ecology may choose a degree
emphasis from communications, fisher-
ies, or management/research areas. In
communications, biological training is
combined with course work in journalism,
social sciences and the uses of elec-
tronic media. Management/research
emphasizes applied wildlife and fisheries
ecology and offers the best preparation
for graduate study.

The B.S. degree curriculum in zoology
is designed to provide a background in
biology with specialization in that area of
zoology in which the student wishes to

Oklahoma State University 87
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 and botany. Zoology provides a background for many applied and professional careers.

Graduate Programs

Programs of Study. Programs of study leading to M.S. and Ph.D. degrees are offered in wildlife and fisheries ecology, zoology and zoology-physiology. The department emphasizes wildlife and fisheries ecology and environmental toxicology. Specializations of faculty include behavioral ecology, carcinogenesis, cellular physiology, cytogenetics, developmental biology, ecology, ecotoxicology, evolution, fisheries biology, herpetology, ichthyology, immunology, mammalogy, membrane physiology, molecular systematics, parasitology, physiological ecology, reproductive endocrinology, teratology, and wildlife nutrition. The department includes the Water Quality Research Laboratory and the Cooperative Fish and Wildlife Research Unit.

Teaching and research assistantships and out-of-state tuition waivers are available to qualified students. Information and application forms may be obtained from the departmental office.

Prerequisites. Applicants must have completed a baccalaureate degree including 40 semester hours in biology and related areas and have completed the Graduate Record Examination including the advanced test in biology.

The Master of Science Degree. In addition to the general Graduate College requirements, students are required to show competence in either a reading knowledge of a foreign language or a relevant research technique such as statistics, mathematics, or computer science. Students must prepare research proposals and complete either a thesis or a report. For the thesis option, 30 credit hours are required; for the report option, 32 credit hours. The plan of study must include at least two credit hours in a graduate seminar.

The Doctor of Philosophy Degree. In addition to the general Graduate College requirements, students are required to show competence in either a reading knowledge of a foreign language or relevant research technique such as statistics, mathematics, or computer science. This requirement is in addition to the competence demonstrated for the M.S. degree. The plan of study must include

60 credit hours and at least four credit hours in a graduate seminar. A student must pass written and oral examinations, prepare a research proposal, and complete a dissertation based on original research worthy of publication.
College of Business Administration

Gregory C. Mosier, J.D., Ed.D.,
Interim Dean
Julie L. Weathers, M.B.A.,
Director of Extension
Craig B. Robison, Ed.D., Director
of Student Academic Services

Today's business world is one of excitement. It offers young men and women a challenging professional future as well as the opportunity for meaningful social involvement and civic service. A steadily increasing number of young people today are choosing careers in business as they seek to shape our nation’s economic structure and deal with some of its social problems. New developments in automation, economics, and innovations in management techniques and social responsibility are constantly creating new and exciting opportunities. The College of Business Administration (CBA) at Oklahoma State University assists in preparing students for these opportunities.

The College of Business Administration seeks to accomplish three major objectives: (1) to provide students with a liberal education in a program which includes study in four general areas: behavioral and social sciences, communications, humanities and fine arts, and natural science and mathematics; (2) to provide students with an understanding of the functions of business and other economic units in the American economy, which includes study in the basic areas of accounting, economics, business law, finance, management, management information systems, marketing, production and statistics; and (3) to provide students with the opportunity for specialized study in selected major areas of business.

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 Aid Office by February 1 during one’s senior year in high school. College of Business Administration scholarships are primarily 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 consultation with a staff adviser in the Office of Student Academic Services of the CBA.

All students should tentatively select a major during their sophomore year. Each student will then be assigned to a faculty adviser from the major field of study. Thereafter, counseling will be provided by the assigned faculty adviser.

The dean and associate dean, as well as the director of the Office of Student Academic Services, are available to all students for counseling on special problems.

Academic Programs

Undergraduate Programs. The Bachelor of Science in Business Administration degree is offered by the four departments and one school of the College. Departmental majors are listed below.

Accounting, with a major in accounting.
Economics and Legal Studies in Business, with majors in economics and an option in business economics and quantitative studies; general business; and agribusiness.
Finance, with a major in finance and an option in commercial bank management.
Management, with majors in management with an option in human resource 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 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 six hours in each of the areas-Social and Behavioral Sciences, Humanities, and Analytical and Quantitative Thought, and four hours in the area of Natural Sciences. No more than 18 of the 34 hours meeting breadth requirements may be in disciplines directly supportive of the major.

Two other requirements include: an International Dimension and a "Scientific Investigation" component. These may be met in any part of the student's program, and thus do not necessarily add to the number of hours required. The International Dimension simply requires each student to learn something about cultures and societies outside the United States. The Scientific Investigation requirement involves some kind of laboratory experience with student involvement. More detail concerning these and other requirements is found in the next section, "Lower-division Requirements."

Lower-division Requirements
Work in the freshman and sophomore years is planned in such a way as to give the student basic information in the general areas of (1) behavioral and social sciences, (2) communications, (3) humanities and fine arts, (4) natural science and mathematics, and (5) business foundation courses. In order to ensure study in each of these five areas, courses totaling up to 59 semester credit hours are required. The student may also 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, MSIS 3223, MKTG 3213 and FIN 3113; ENGL 1113 and 1213; ACCTG 2103 and 2203; ECON 2013 and 2023; MATH 1513; MSIS 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)

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 emphasis in accounting.

The common objective of the B.S. and M.S. accounting programs is to educate students to commence and continue to develop in a wide range of professional accounting careers. The specific objective of the B.S. in accounting program is to provide basic conceptual and business knowledge as a foundation for accounting career development; the objective of the M.S. in accounting is to provide candidates with a greater breadth and depth in accounting than is possible in the B.S. program, in order to prepare graduates for careers as professional accountants in financial institutions, industry, nonbusiness organizations, and public practice.

Students who are considering a professional accounting career should have above-average aptitudes in mathematics and English, disciplined work habits, an interest in working with people and an attitude of service.

The B.S. in accounting, including an auditing course, is acceptable in lieu of

90 College of Business Administration
Graduate Programs

The Master of Science Degree. The specific objectives of the M.S. in accounting are to provide candidates with a greater breadth and depth than is possible in the B.S. program, in order to prepare graduates for careers as professional accountants in financial institutions, industry, nonbusiness organizations, and public practice, and to develop judgmental ability in accounting and related areas. Advanced courses provide a theoretical base for insight into significant problems confronting the accounting profession. In addition, a specialty in taxation is available for interested candidates. The candidate receives assistance from the faculty in selecting a pattern of courses designed to prepare the student according to the chosen professional goals.

Graduates of recognized colleges and universities whose records indicate adequate intellectual capacity and desirable personal characteristics may qualify for admission. The typical applicant admitted to the program has a GMAT score of 525 or above and an undergraduate grade-point average of 3.25 or above.

Prerequisites. The following are required: 24 semester hours of advanced accounting; six semester hours of business law; business calculus; three semester hours each in finance, management, marketing, production, quantitative analysis, business policy, intermediate microeconomics; and six semester hours in statistics. As many as eight semester hours of course deficiencies may be removed within the 32 semester hours required for the degree.

The Doctor of Philosophy Degree. The Ph.D. in the College of Business Administration with a major in accounting emphasizes flexibility to meet the particular needs and objectives of individual candidates. The program is designed to provide the highest degree of preparation for the individual student, enabling the student to make significant professional contributions in research, teaching, or in business or government positions.

Graduates of recognized colleges and universities whose records indicate adequate intellectual capacity and desirable personal characteristics may qualify if they have a good academic record and achieve satisfactory scores on the GMAT. Admission is competitive.

The Ph.D. program is designed so that a candidate may, at his or her option, specialize in one of the following accounting areas: auditing, managerial accounting, financial accounting, or taxation. All candidates are required to take a two-semester seminar which provides an overview of relevant academic literature. This seminar is restricted to Ph.D. candidates in accounting. Two minor areas, one of which may be outside the College of Business Administration, are required, in addition to competence in economics and quantitative analysis. The candidate’s advisory committee is responsible for assisting in the development of a plan of study encompassing the above areas. Students in residence are required to do teaching or research on a quarter-time basis while earning the degree.

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 management 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 conjunction with the graduate adviser. Students may use elective courses either to continue broad managerial development or to emphasize studies in a functional area (finance, management or marketing).

Outstanding students with baccalaureate degrees in any field of study may apply. 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 CBA.

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 and Legal Studies in Business**

Professor and Head Joseph M. Jadlow, 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 people'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—both national and international. It provides an excellent background for the study of law and international relations. 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.

**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.

**Agribusiness**

The major in agribusiness is offered in cooperation with the Department of Agricultural Economics. Students pursuing this major may obtain a Bachelor of Science in Agriculture or Business Administration. Typically, a graduate of this program would be prepared for employment in the food industry by organizations involved in the production, processing, distribution, marketing, transportation, research, or supplying of food, food products, or input for the production or processing of food products for human or animal consumption.

The student will take regular general education course work as well as foundation courses in agriculture and business administration. Additional upper-division course work in agricultural economics and business will be selected by the student in consultation with his or her major adviser.

**Graduate Programs**

The department offers work leading to the Master of Science degree and the Doctor of Philosophy degree. The graduate program in economics prepares economists for academic careers as well as research and administrative positions in business and government agencies.

Graduate fields of specialization include monetary economics, public finance, international economics, economic development, econometrics, labor and human resource economics, industrial organization, and urban and regional economics. In addition, graduate courses are offered in the history of economic thought and in mathematical economics.

The initial admission to a graduate program 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 help-
ful 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 study 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

Associate Professor and Head Janice W. Jadlow, Ph.D.

There are financial implications in virtually all organizational decisions, whether the organization is a business firm, a nonprofit organization, or a government. Thus, financial executives are of central importance to overall planning and control, and nonfinancial executives must know enough finance to work the financial implications into their areas of expertise. The increasing importance of finance for any organization has accompanied the evolution of the field of finance itself.

Finance has evolved since the early 1900s from a descriptive to an analytical discipline recognized as a genuine science. Finance builds on economic theory to focus on both sides of the organization’s balance sheet, asset analysis and the optimal mix of liabilities and equity, including the implications of investor portfolio theory for the firm. Finance consists of three interrelated core areas: financial markets and institutions, investments and portfolio theory, and managerial (business) finance. Other topics interwoven within these core areas include international finance, futures and options, bank management, insurance, real estate, and personal finance. Recent issues of emphasis include deregulation of financial institutions, the implications of telecommunications on financial information and decisions, innovative methods of financing long-term investments, and the influence of inflation on interest rates.

The primary objective of the undergraduate finance curriculum is to develop a broad understanding of the financial aspects of the activities and decisions and to provide thorough training in the fundamental tools of financial analysis. Toward these ends, the study of finance is complemented with the development of elementary mathematical and statistical skills and with study in economics, accounting, and business administration. The major in finance is intended to prepare students for positions with a wide variety of organizations that require special understanding of financial analysis, financial management and financial systems.

Finance majors entering the corporate world may begin in one of several positions. A career in financial management can lead to a major executive position, including chief executive officer. The positions within managerial finance include capital budgeting analyst, daily cash manager, credit analyst, financial analyst (who works closely with accountants), and property manager.

Alternatively, finance majors may choose to enter the financial services industries. Career possibilities include: the banking industry as a loan officer, retail bank manager, or a member of the trust department; the securities industry as a stockbroker or account executive, a securities analyst, investment banker, or financial planner; and the insurance industry as an agent or underwriter.

Graduate Programs

Concentrations in finance are offered through the Master of Business Administration and Doctor of Philosophy degrees.

The Master of Business Administration Degree. (See "Business Administration.")

The Doctor of Philosophy Degree. The Ph.D., as offered by the Department of Finance, provides intensive study in finance, preparing students for significant professional contributions in university teaching and research or staff positions in business or government.

The program is designed to meet the needs and objectives of individual students, but all students will seek an in-depth understanding of the theoretical foundations of financial economics and develop research skills in finance.

Students will select finance as their major area of study. One or two minor areas are also to be selected. A minor area must be taken in the College of Business Administration from accounting, economics, management, management science, or marketing. The second minor area (if any) may or may not be taken outside the College of Business Administration. As support for the major and minor field of study, each student is required to attain graduate level competence in economic theory and quantitative methods.

Prerequisites for admission to the program are appropriate basic courses in calculus, statistics and computer science.

Competence in planning and executing research is demonstrated by a dissertation. In addition, each candidate must pass comprehensive qualifying examinations and a final oral examination on the dissertation itself.

Outstanding students with degrees in any field of study may apply. Applications for admission are evaluated on the basis of (1) undergraduate and graduate grade-point averages, (2) score on the Graduate Management Admissions Test, (3) a two- or three-page statement describing goals and academic interests, (4) three letters of recommendation, (5) evidence of research potential, and
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 nonbusiness 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 designing 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 skills, accounting, and necessary knowledge of theory and methods in management and management science. It is not necessary for students to have interests in each of these areas since the field offers substantial opportunities for specialization.

The curriculum for the bachelor’s degree requires of all students a common foundation of work in the disciplines listed above. Students are then guided into advanced work in these areas and in their applications of courses in management and management science. Four degree programs are available for choice based upon the student’s interest in specialized work. Each program emphasizes analytical tools, the scientific method and essential theory that will be useful in a rapidly changing world.

Management

The major in management is designed to prepare students for leadership careers as managers with business or nonprofit organizations. It emphasizes the study of management systems and problems. Majors are typically employed by organizations of all types and sizes as managers, management trainees or staff specialists. The field of management has much to offer those interested in leadership roles in business and public sector organizations.

Human Resource Management

The option in human resource management is designed to prepare students for careers in personnel and human resource management. Anything that concerns the work force of an organization is the concern of the personnel manager. This includes working with labor relations and collective bargaining, forecasting the demand for personnel, attracting potential employees, orienting them and then developing the careers of those employed. For those who enjoy working with both data and people, a career in personnel management offers many opportunities and the chance for personal growth and development.

Management Information Systems

The major in management information systems (MIS) prepares students for work in information systems development and operation. Both applications of computer systems technology and understanding of data and information flows among the functional areas of business are emphasized. The continuing integration of the computer in all aspects of business and the critical need for responsive management information systems has created a strong demand for graduates who are knowledgeable about both information systems and business. The first two years of study involve the study of mathematics, statistics, and computer science as well as English, accounting, economics, psychology and other courses designed to develop a broad educational background. The junior and senior years focus on aspects of information systems and computer technology including main-frame and microcomputer programming languages, data base management, artificial intelligence, systems analysis, data communication systems, and management science methods. Coverage of functional areas prepares MIS graduates to understand the information needs of complex business organizations for which information systems are developed.

Management Science and Computer Systems

The major in management science and computer systems is designed to prepare students for careers as staff managers in complex businesses or nonprofit organizations. There is a high demand for persons with advanced computer competency with a knowledge of business systems. Many students have a special interest in building concentrations in management systems and computer science. The management science and computer systems major is ideal for this purpose. Examples of topics covered include managerial decision theory, operations research, systems analysis, management information systems and operations management. The study of management science and computer topics may be combined with advanced work in related disciplines for those with appropriate interests. Management science and computer systems majors typically enter business or public organizations as management science 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.

Competence in planning and executing research must be demonstrated in a dissertation. In addition, each candidate must pass a series of comprehensive qualifying examinations, both written and oral, and a separate, final oral examination on the dissertation itself. To enhance teaching skills, all Ph.D. students in residence are required to teach on a quarter- or half-time basis for at least one semester while earning the degree.

Outstanding students with master’s degrees in any field of study may apply. The application for admission to the program is evaluated on the basis of (1) undergraduate and graduate grade-point averages, (2) the 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 ensure that all material related to the above criteria is received by the department.

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 15 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) the 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 recommendations, (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 administration with an emphasis in marketing are available through the department.
There are increasing opportunities in business, industry and state and federal agencies for persons with unique preparation in the several education specialties who do not desire to teach in the schools. 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)
- School counselor (elementary and secondary)
- School psychologist
- School psychometrist

**III. Teaching Specialties-Certification Areas**
- Elementary school certificate (K-8)
- Middle Level English
- Middle Level Foreign Language
- Middle Level Math
- Middle Level Science
- Middle Level Social Studies
- Elementary-secondary school certificate (K-12)
- Art
- Foreign language
- Health
- Physical education/health
- Reading specialist
- Special education (emotionally disturbed, learning disability and mental retardation)
- Secondary school certificate (7-12)
- Business education
- English
- Mathematics
- Science
- Social studies
- Speech/Drama
- Technical education
- Trade and industrial education

**II. 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
- Health and wellness
- Higher education administration (junior college, 4-year college, and university)
- Human development
- Human resources development
- Instructional systems
- Leisure service
- Marriage and family therapy
- Microcomputer applications
- Occupational education administration
- Student personnel
- Therapeutic recreation

**Accreditation**
In the College of Education, the aviation programs are accredited by the
Federal Aviation Administration, the only nationally-recognized accrediting body for programs in aviation. OSU was the first university in Oklahoma with a program receiving this designation. The counseling psychology program is provisionally accredited by the American Psychological Association. Programs in the School of Health, Physical Education and Leisure are accredited by the National Recreation and Park Association, as well as the American Association for Leisure and Recreation. All teacher education programs are accredited by the Oklahoma State Board of Education and the North Central Association of Colleges and Secondary Schools. Business education, technical education, as well as, trade and industrial education teacher education programs, are also accredited by the Oklahoma State Department of Vocational-Technical Education.

High School Preparation

Students are expected to satisfy the high school curriculum requirements as determined by the Oklahoma State Regents for Higher Education. It is recommended that the student be involved in clubs and organizations as well as have had some experiences working with children and youth, depending on the chosen 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.

Criteria for students wishing to transfer into the College of Education include a required minimum grade-point average based on the University graduation and retention grade-point average policy.

<table>
<thead>
<tr>
<th>Total hours attempted</th>
<th>Minimum GPA required</th>
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<tr>
<td>fewer than 31</td>
<td>1.75</td>
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<tr>
<td>31 through 45</td>
<td>2.00</td>
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<tr>
<td>over 45</td>
<td>2.50</td>
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Requests from students seeking readmission after having been placed under probation/suspension should be submitted to the Office of Student Academic Services in the College of Education and will be reviewed by the College of Education Academic Status Review Committee prior to readmission. The recommendations of this committee will be subject to approval by the dean of the College of Education.

All student grades are reviewed at the end of each semester to determine whether appropriate academic progress is being made.

For graduation with recommendation for Licensure/Certification, the following minimum GPAs are required: (1) a 2.50 overall GPA; (2) a 2.50 GPA in the Major Requirements; (3) a 2.50 GPA in Professional Core Requirements; and (4) where noted, a 2.50 GPA in the College/Departmental Requirements. The student must earn minimum grades of "C" or "P" in each course in the Major Requirements, the Professional Core Requirements, and where noted, the College/Departmental Requirements. The student must earn grades of "P" in all sections of observation (lab and clinical experience) courses and student teaching for recommendation for Licensure/Certification.

Scholarships

The College of Education offers a variety of scholarships for undergraduate and graduate students. The following are scholarships offered by the College of Education:

- Air Traffic Control Associated Scholarship
- Ray E. Brown Memorial Scholarship
- College of Education Alumni Association Centennial Scholarship
- College of Education Alumni Association Freshman Scholarship
- College of Education Alumni Association Minority Scholarship
- College of Education Alumni Association 21st Century Scholarship
- College of Education Special Leadership Award
- Valerie Colvin Scholarship
- Gretchen Lynnette Cumberledge Air Traffic Control Association Scholarship
- Rachel Dotson Scholarship
- Paul Douglas Teacher Scholarship
- Lacrisa Diane Stephens Earls Memorial Scholarship
- Education Student Council Scholarship
- Charles A. “Adam” Esslinger Outdoor Recreation Scholarship
- Future Teachers Scholarship
- Roger and Donna Hardesty Aviation Scholarship
- Aix B. Harrison 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
- Helen M. Jones Scholarship
- Richard and Edna Jungers Scholarship
- Robert B. Kamm Distinguished Graduate Fellowship Fund
- Kappa Delta Pi Scholarship
- John Leslie Lehew III Scholarship
- Locke, Wright, Foster, and Cross Graduate Scholarship
- Mable Marietta Macy-Oaks Memorial Art Scholarship
- McMaster Flying Aggies Scholarship
- Leon L. Munson Memorial Scholarship
- The Ninety Nines, Inc.
- Percy W. Oaks, Sr. Memorial Art Scholarship
- Outstanding Freshman Aviation Education Student
- James L. Prince Memorial Scholarship
- Wendell Sharpton Family Scholarship
- James Vandegrift Scholarship
- Amy Louise Wagner Memorial Scholarship
- Hoyt E. Walkup Scholarship
- Loyd L. Wiggins Scholarship
- Xerox Corporation Scholarship

In addition to these scholarships, Oklahoma State University is allocated, on an annual basis, a large number of Oklahoma State Regents for Higher Education scholarships. These scholarships are available in teaching fields identified by the Oklahoma State Board of Education as critical shortage areas and are only available to Oklahoma residents attending or desiring to attend OSU.

Privately funded scholarships are also available. Information concerning these scholarships may be obtained through the office of the appropriate department head.

Academic Advising

Academic advisement for undergraduate students is coordinated through the Office of Student Academic Services, located in 108 Gundersen, in the College of Education. Students are assigned to a particular academic adviser in the Office of Student Services or to the faculty in the academic departments, depending on the student’s declared major. Faculty academic advisers are nominated by their department heads and appointed by the dean of the College. Academic advisers may confer with their advisees on such matters as vocational counseling, course selection, academic problems, long-range professional goals, and semester by semester enrollment.
Special Academic Programs

Bachelor of University Studies. The College of Education utilizes the Bachelor of University Studies degree program along with the other colleges in the University. Unique career objectives of nontraditional students may be met by working with academic advisers in selecting a specially-tailored program which ultimately leads to a degree.

Applied Educational Studies. The applied educational studies, Ed.D., is an interdisciplinary, cross-departmental degree program coordinated by the Office of the Dean of the College of Education, to combine the traditional priority of preparing leaders in education with the nontraditional degree needs related to education.

Students interested in such an interdisciplinary degree should contact a department within the college for information on degree requirements and the application process.

Tutoring Program. The Reading and Math Learning Center within the Department of Curriculum and Instruction offers elementary education undergraduate and graduate students a faculty-supervised opportunity to tutor school-age children interested in improving their reading and math skills.

OSU-Frontier Alliance. OSU-Frontier Alliance, initiated in 1990, provides OSU teacher education students the opportunity to be involved in a joint institutional effort designed as a proactive approach for meeting the needs of students and teachers in a culturally diverse environment. This alliance allows OSU to have a continuing collaboration with the Native American tribal community and the Frontier School District.

Professional Development Conferences. Teacher education students and alumni are encouraged to attend the annual Oklahoma Teacher of the Year (OKTOY) organization conference held on the OSU campus. The College of Education is the official home of the Oklahoma Teacher of the Year organization. The membership of the OKTOY organization is made up of winners of the annual Oklahoma Teacher of the Year competition. The goals of the organization are to attract academically talented high school youth to the teaching profession; to retain undergraduate students currently enrolled in education programs; to feature the skills, talents, and expertise of Oklahoma's finest educators; to create student/teacher mentor relationships; and to establish a cadre of educators as a resource for research on improved instruction and academic excellence.

Graduation Check. The College of Education Office of Student Academic Services prepares a graduation check which indicates the undergraduate's status for graduation. For those undergraduates pursuing teacher education programs, the academic status for licensure as a teacher is included in the graduation check. Undergraduates may request through their academic advisers that the graduation check be completed.

Job Placement. An employment service provided for College of Education students and coordinated through the University Placement Office was initiated in the 1960's for teacher placement services and has broadened its service to the campus. University Placement assists students in signing up for interviews with in-state and out-of-state school districts. Lists of employment opportunities with school districts not recruiting on campus are maintained at all times. Resources that are available to assist the student seeking employment include resume information, interviewing tips and placement annuals. Registration with the University Placement Office affords students the opportunity to participate in the annual teacher placement days held on campus in April and to access the office's referral service to school districts.

Alumni Association. The College of Education Alumni Association compliments the cooperative efforts of the University Placement service to assist a student during college preparation for a career in education. The organization provides the student a professional support organization and an immediate network of professional contacts. Four scholarships are provided by the Alumni Association for students in the College of Education. Graduates attending the college convocation receive an invitation for a one year complimentary membership to the College of Education Alumni Association.

General Education Requirements

All undergraduate degrees in the College of Education require a minimum of 40 semester hours in general education which includes the following: communication skills, mathematics, United States history and government, science, behavioral studies, arts and humanities, and electives. All degrees are consistent with the current University General Education requirements and the Oklahoma State Department of Education standards.

Departmental Clubs and Honor Societies

American Association of Airport Executives
Education Student Council
Elementary Educators of Tomorrow
Flying Aggies
HPEL Club (health, physical education and leisure)
Kappa Delta Pi (education honor society)
Minority Educators of Tomorrow
Phi Delta Pi (education honor society)
Minority Educators of Tomorrow
Student Art Education Association
Student Council for Exceptional Children
Student Education Association

Applied Behavioral Studies

Professor and Head Dale R. Fuqua, Ph.D.

The Department of Applied Behavioral Studies in the College of Education serves the University Teacher Education program and offers degree programs at the graduate level. Areas included in the department are special education, counseling and student personnel, educational psychology, school 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.

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 the administration of special education programs in public and private settings.

Counseling and Student Personnel Programs. M.S. Programs. The counseling and student personnel area includes the following comprehensive specializations leading to master's degrees: community counseling, 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 and community mental health agencies. Students may choose elective courses in selected areas of specialization such as youth counseling, substance abuse counseling, and mental health counseling.

The M.S. programs in elementary/middle school and secondary school counseling are designed 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 and practica requirements for licensure as licensed professional counselors in Oklahoma.

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. Applications for all M.S. programs are due and will be reviewed April 15 and October 15.

Ph.D. Programs. The Ph.D. degree offers specializations in counseling psychology and student personnel administration. The 108-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 practicum experiences are integrated. Students must complete a one-year full-time internship or a two-year half-time internship.

Students in the Ph.D. in student personnel administration are prepared to administer student personnel programs at institutions of higher education. The curriculum is sufficiently flexible to permit individuals to develop an area of expertise, such as training and development, organizational behavior or computer applications. A minimum of a 36-week student personnel administration internship is required.

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 in educational psychology is available as an area of specialization within the M.S. in applied behavioral studies. Educational psychology emphasizes the application of psychological theory and research to the field of education. Every educational psychology master's student takes basic courses in educational psychology and research. Each student also takes additional courses in a concentration area of either educational/instructional psychology or human development.

Ph.D. Programs. A doctorate in educational psychology is available as an area of specialization within the Ph.D. in applied behavioral studies. The educational psychology Ph.D. includes emphases in teaching and research, and instructional systems design. The teaching and research emphasis includes content in instructional psychology, education of the gifted and talented, and/or human development.

The teaching and research emphasis prepares students for the role of teacher and researcher in higher education, or researcher in non-educational settings. The instructional systems design specialization focuses on the development of systems for training and instructional support in business, government and educational settings. The educational psychology Ph.D. is designed to provide students with maximum opportunity to individualize their programs according to their own interests, needs and professional goals. There are no specifically required courses. Students, in consultation with the faculty, choose subject matter domains around which they structure their programs. Each domain is to be mastered through formal course work, independent study and practicum experiences. For each domain, the student specifies a "qualifying examination experience," the completion of which will be taken as evidence of mastery of the domain.

Applications for the Ph.D. program in educational psychology are due by February 1 for the following fall enrollment.

School Psychology Programs. M.S. Programs. The master's in school psychology prepares individuals to provide psychometric services to schools, youth agencies and other organizations working with children and youth. The school psychology program may include state certification requirements.

Ph.D. Programs. The doctorate in school psychology is available through the Ph.D. in applied behavioral studies. Doctoral level study in school psychology is designed to prepare individuals who can apply their knowledge of the behavioral sciences and their professional skills in ways that enhance learning and adjustment. To achieve this purpose, emphasis is placed on the study and integration of principles of psychology and education. In general, training is provided in the major areas of functioning within the profession: consultation/organizational development, psychological assessment, intervention procedures, and research/evaluation.

The Ph.D. program includes the requirements for state licensure as a psychologist. Applications for the Ph.D. program in school psychology are due February 1 for the following fall semester.

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 coll-
Aviation and Space Education

Professor and Head Kenneth E. Wiggins, Ed.D.

Aviation Education

The aviation education program prepares students for careers in the aviation industry. A bachelor's degree in aviation sciences offers three options: professional pilot, aviation management, and technical services management. Each of these options is tailored to meet specific needs for skilled personnel in the air carrier, aircraft manufacturing and sales, and general aviation segments of the industry. The degree program is a fusion of liberal arts, management, business, and aviation courses. Academic credit is awarded for flight training and associated ground school courses. The aviation sciences program is also offered in Tulsa through the University Center at Tulsa (UCT).

Students in the professional pilot option will complete all flight training through the Commercial Pilot with Instrument, Multi-engine, and Certified Flight Instructor ratings. Flight Instructor-Instrument and Multi-engine instructor ratings are available as electives. Students in this option must complete a minimum of two flight ratings in residence at OSU. This option prepares individuals for careers as corporate, commuter or airline pilots.

Flight training is conducted at Stillwater Municipal Airport. Flight training for the University Center at Tulsa is administered by Oklahoma State University at the Alliance Flight Center. Both flight training and ground school courses are conducted under Federal Air Regulation Part 141.

The aviation management option is designed for students who are interested in a management position in some component of the aerospace industry. Employment opportunities include management positions with fixed-based operators, air carriers, corporate flight departments, commuter and air taxi flight operators, and a variety of functions associated with airport operations.

The technical services management option builds on an individual's technical experience to prepare the student for management positions in all segments of the aviation industry.

The Federal Aviation Administration (FAA) Airway Science program is available for those individuals seeking careers with the federal government.

Interested parties may contact the Department head concerning graduate programs at the master's and doctoral level with an emphasis in aviation, management and related areas.

Oklahoma State University is a member of the University Aviation Association and the National Intercollegiate Flying Association (NIFA). The university aviation club, the OSU Flying Aggies, has been recognized 20 times by NIFA as the nation's outstanding collegiate aviation club.

Space Science Education

The space science education program presents and supports courses primarily designed for pre- and in-service teachers. The department serves as a regional teacher resource center for reference and printed materials, and audiovisual aids relating to national projects in aviation and space research.

A major responsibility of the department is the coordination of the Aerospace Education Services Program. Oklahoma State University, under contract to the National Aeronautics and Space Administration, provides aerospace education specialists and support staff for the delivery of educational visits to public schools and the delivery of space-related information via satellite. In addition to school programs, the specialists support teacher workshops, and work with professional organizations and civic groups.

Curriculum and Instruction

Associate Professor and Interim Head Bruce A. Petty, Ph.D.

The Department of Curriculum and Instruction (CIED) offers bachelor's, master's 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 in Elementary Education degree 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 accompanied by substantial field-based practicum experiences.

The Bachelor of Science in Secondary Education degree is available in the following discipline areas: English, foreign language, mathematics, science and social studies. Completion of this program emphasizing one of these areas qualifies the student for a secondary (7-12) Oklahoma license. Students emphasizing art, or foreign language, 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 accompanied by substantial field-based practicum experiences.

Programs leading to an Oklahoma license as a curriculum administrator and reading 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 opportunities for research and practicum experiences for graduate students and faculty members as well as providing a valuable service to the community.

The department also sponsors the Natural Resources and Environmental Education Center.

Graduate Programs

The Department of Curriculum and Instruction offers graduate degree programs at the master's 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, reading coordinators, team leaders, and research specialists.
addition, they prepare persons to assume teaching positions in colleges and universities where they become methods instructors and 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.

Course work leading to the Master of Science degree in curriculum and instruction with emphasis in curriculum/supervision, elementary education, 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 36 credit hours of approved course work which includes a creative component. The creative component must be explicitly identified on the plan of study.

Unqualified admission to the master's degree program is granted to a graduate of an accredited college or university who has made application to the Graduate College and who has achieved a grade-point average of at least (1) 2.60 for all undergraduate course work; and, (2) 3.25 for all undergraduate upper-division and graduate course work; or, (3) 3.50 for OSU graduate course work included in the initial nine hours of study.

Provisional admission to the master's degree program is granted to a graduate of an accredited college or university who has been admitted to the Graduate College and who has achieved a grade-point average less than the minimum required for unqualified admission but at least (1) 2.60 for all undergraduate course work; and, (2) 2.80 for all undergraduate upper-division and graduate course work, or 3.00 for OSU graduate course work included in the initial nine hours of study.

Provisional admission is granted for a minimum enrollment in six credit hours of CIED course work (5000 or 6000 level) to be determined through advisement and taken during one calendar year. A student admitted provisionally must earn a grade-point average of at least 3.50 in these six hours to be admitted (unqualified). Dismissal from the program at the end of this probationary period is automatic if the student fails to satisfy this stipulation.

Further information about this degree may be found in the departmental publication Master's Degree Policies and Regulations available in 301 Gundersen and under "Master's Degree" of 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 60 semester hours beyond the master'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.

Educational Administration and Higher Education

Professor and Interim Head Martin Burlingame, 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 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. 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. 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.

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.) with an emphasis in educational administration. 

The degree is designed for teachers and administrators in public schools who seek certification as elementary and/or secondary school administration, elementary superintendent or school district superintendent. The Specialist in Education program requires a minimum of 39 post-masters hours. Beginning December 31, 1995, prerequisites for education specialist course work (EAHED 6243, 6263, 6323, 6393, 6453 and 6573) include OSU graduate program admission and/or consent of the instructor. Beginning December 31, 1996, enrollment in the same course work will be limited to students admitted into OSU post-masters degree programs. Further information about this degree may be found under "Specialist in Education" in the "Graduate College" section of the Catalog; advisement materials are available in the department.

The Doctor of Education Degree. The program in educational administration focuses on the development of education leaders for the public schools. It employs a multidisciplinary approach to administrative processes, incorporating knowledge from industrial management, political science, economics, organizational sociology, and other fields as well as from education.

Programs in higher education focus on the preparation of administrators and faculty. The administrator preparation program utilizes knowledge from many fields of administration and allows the student to make appropriate application to higher education. The program for two- and four-year college teachers stresses an interdisciplinary approach and allows the student to develop 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.

Applicants entering the doctoral program after completing a master's degree may apply up to nine hours of post-master's credit toward the doctorate, with the approval of the doctoral committee.

Applicants entering the doctoral program after completing a specialist degree must earn a minimum of 40 credit hours, including dissertation hours, from Oklahoma State University.

Further information about this degree may be found under "Doctor of Education" in the "Graduate College" section of the Catalog.

School of Health, Physical Education and Leisure

Professor and Director Lowell M. Caneday, Ph.D.

The School of Health, Physical Education and Leisure (HPEL) is a multi-faceted organizational unit encompassing undergraduate and graduate academic programs in health, physical education and leisure studies, and outreach programs. The School of HPEL seeks to fulfill the traditional functions of teaching, research, extension and public service which are consistent with Oklahoma State University. The mission of the School of HPEL is to promote excellence in human development and environmental consciousness to enhance the knowledge, attitudes and behaviors of individuals through increased responsibility for social, physical, mental, emotional and environmental health. This mission is accomplished through programs and services via teaching, research and scholarly activity, university and professional services and extension programs.

Health

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

The program in health provides students with a selection of two major undergraduate professional preparation
degree emphases: community wellness and school health.

The community wellness track prepares students in the health promotion field. Students are exposed to a curriculum that yields expertise in developing health and wellness programs consisting of fitness, weight control, stress management, substance abuse, gerontology, and related health promotion dimensions focusing on behavior modification and problem prevention. Students culminate their experiences with on-site internships in the last semester. The community wellness curriculum consists of preparing graduates for employment in hospital-based wellness centers, community settings, corporate wellness and private enterprise.

The school health track, 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.

The bachelor's degree in health also provides an essential foundation for the master's and doctoral degrees in related areas. As a part of a comprehensive university, students in the health programs gain valuable insight from faculty who are extensively involved in health-related professions, on the state, regional and national levels, and in research and professional publications.

Leisure Studies

Associate Professor and Coordinator
Jerry Jordan, Ed.D.

The program in leisure studies at Oklahoma State University prepares students at the undergraduate level for careers in leisure service management and therapeutic recreation. Both options are accredited by the National Recreation and Park Association (NRPA) and the American Association for Leisure and Recreation (AALR). Students completing the programs are eligible to sit for respective national certification examinations. Leisure service management prepares students for employment in a variety of settings such as municipal, commercial, and industrial recreation; state and national park services; YMCAs and YWCAs; and armed services recreation. Therapeutic recreation prepares students to work with persons with disabilities in a variety of settings which include hospitals, rehabilitation centers, day programs, institutions and within the community.

Beyond the baccalaureate level, the program in leisure provides preparation at the master's and doctoral level. Thus, the undergraduate program serves as a foundation for the graduate programs and receives the benefit of faculty involved in research, publication and professional service.

Physical Education

Professor and Coordinator John G.
Bayless, Ed.D.

The program in physical education includes a curriculum designed for professional preparation as a certified teacher of physical education. Specifically, students obtain certification that qualifies them to teach physical education and health in grades kindergarten through 12.

The curriculum has two emphasis areas, namely, exercise science kinesiology, and specific course work in pedagogy. Core courses for all physical education students include an introductory course for the discipline, eight hours of methodology in sport activities, courses in applied anatomy and kinesiology, biomechanics, motor learning, exercise physiology, and motor development.

Students engage in two formal field-based experiences designed to better prepare them to become certified teachers. First, each student must complete a 45-hour practicum consisting of on-site observational experiences in one or more public school settings. Second, during the last semester of enrollment, each student completes a student teaching experience that includes on-site experience as both an elementary and a secondary physical educator.

Preparation to become a public school athletic coach is available via selected courses in the physical education and health education curricula. A 2.50 cumulative grade-point average is required for admission into the teacher education program and for graduation in all School of HPEL programs.

Graduate Programs

Professor and Director Lowell M.
Caneday, Ph.D.

OSU's School of Health, Physical Education, and Leisure offers graduate programs at both the master's and the doctoral level. The Master of Science degree has three major emphasis areas: health, physical education, and leisure with a specialization 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, or leisure is offered. Based on the student's previous experience, 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 or leisure.

Admission Requirements. Depending upon the area of emphasis, a bachelor's degree in physical education, health, 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 accredited undergraduate program; (2) MAT score of 40 or GRE score of 1450; and (3) three letters of recommendation. Applicants not meeting these requirements are subject to review by the School's Graduate Screening Committee.

Degree Requirements. A non-thesis minimum of 32 hours or 30 hours with six hours for a thesis must be taken, including 21 hours of courses at the 5000 level and 15 hours in the School.

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

The health program offers a master's degree with specialization in health promotion, while the physical education program offers a master's degree with specialization in administration, pedagogy, adapted physical education or exercise science. The program in leisure has two areas of specialization: leisure services management, and therapeutic recreation.

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 is required. The applicant should have an undergraduate GPA of at least 3.00 and a graduate GPA of at least 3.70. Students are required to take the Miller Analogies Test or Graduate Record Examination.

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 12 specified hours in higher education. The remainder of the program is individualized and interdisciplinary ac-
School of Occupational and Adult Education

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

The School of Occupational and Adult Education (OAED) is an administrative unit within the College of Education at Oklahoma State University. The School of OAED consists of faculty in the areas of business professions, technical education, trade and industrial education, and graduate programs related to human resource development, adult and continuing education, and vocational-technical education. In addition, the School of OAED provides programs for prospective and practicing administrators, other workplace education leaders, together with workplace personnel development that is internationally based.

The School of OAED's mission is closely aligned with the statutory purposes of U.S. land-grant universities, long established as teaching, research and service. Increasingly complex and new problems necessitate Oklahoma and Oklahomans to be sensitive and responsive to multicultural, social, political, and economic conditions as a global society and economy approach. Furthermore, these facts demand the continuing evolution of strategies for fulfilling the mission and goals of the School of OAED.

The faculty envision the School of Occupational and Adult Education as having strategic alliances with business, industry, government, and education, developing knowledge and leadership for workplace related education. Faculty see the School as a dynamic organization fostering collaborative relationships among faculty and students. At the same time, the faculty's efforts reflect a sensitivity to and support for equity and increasing human diversity in the classroom and workplace.

The mission of the School of Occupational and Adult Education is to prepare individuals for careers as instructional, administrative or support personnel in the broad field of workplace education in business, industry, government, and education at the state, national, and international levels. The School conducts research to generate new knowledge and disseminate findings for informed decision making and policy development, and provide services to the educational and human resource development community. The School's instructional, research and outreach activities reflect a sensitivity to and support for equity and cultural diversity. These efforts are designed to develop leaders and influence practice and policy in order to achieve national and international prominence in occupational and adult education.

The goals of the School are:
1. To renew and strengthen research activities related to workplace education.
2. To provide graduate programs that reflect transformative roles in education and the workplace.
3. To provide undergraduate programs that reflect emerging workplace education designs and activities.
4. To strengthen leadership and outreach services to the discipline.
5. To expand leadership and outreach services to the discipline.
6. To strengthen the cultural diversity of OAED.

Occupational and Adult Education

Graduate Programs

The M.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 vocation-technical 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 faculty of the School of Occupational and Adult Education with substantial contributions from faculty members in other departments on campus.

Prerequisites. An undergraduate degree in an appropriate field, together with academic qualification indicative of potential success at the graduate level, are necessary. Experience related to the degree sought is desirable, but not necessary, except in the vocational-technical education emphasis.

Business Education

This program is designed to prepare prospective educators as instructional specialists in traditional business education as well as vocational workplace education. Business professions (BUSPR) provides training for a variety of employment opportunities requiring specialized knowledge and skill development for occupations in secondary schools, area vocational schools, and post secondary schools.

Persons seeking certification in the field of business education complete the teacher certification and bachelor's degree programs in the College of Education with specialized education courses being taken in the School of OAED under the BUSPR (Business Professions) and OAED prefixes. Additionally, the student completes 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.

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 provides 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 preprofessional 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 designed to prepare teachers, supervisors, and coordinators for vocational trade and industrial education programs. Plans of study 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, machining, photography, printing, plumbing, sheet metal, small engines, tailoring, upholstering, 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.

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.

Graduate Programs

The trade and industrial education curriculum for the M.S. degree is designed to develop leadership and expertise in a wide variety of trade areas and industrial program design, implementation and evaluation. The curriculum helps students build and increase competence in instructional, occupational, and supervisory skills for advanced leadership opportunities in trade and industrial institutional 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 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 programs. Plans of study 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, machining, photography, printing, plumbing, sheet metal, small engines, tailoring, upholstering, 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.

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 programs. Plans of study 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, machining, photography, printing, plumbing, sheet metal, small engines, tailoring, upholstering, 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.

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.
agriculture; physical education/health; science; social studies; speech and drama; technical education; and trade and industrial education. There are also numerous teaching endorsements available.

Graduate Programs

Basic certification programs offered at the graduate level are school psychologist, school psychologist, special education—emotionally disturbed, learning disabilities, and mental retardation; and speech-language pathology. Advanced certification programs offered at the graduate level include reading specialist, school counselor, school principal—elementary, school principal—secondary, and school superintendent. Master's degrees are available in conjunction with all of the above programs and doctorates are available in many. Areas of concentration in several of these fields may be included as part of master's and doctoral degree programs if approved by the department head of the administrative unit offering the program and the dean of the Graduate College.

Admission to Teacher Education

The criteria for admission to undergraduate Teacher Education programs are based on University-wide policies recommended by the director of Teacher Education through the Council on Teacher Education. Requirements are applicable to all Teacher Education administrative units of the colleges preparing teachers. The student is not considered a fully eligible participant in a Teacher Education program until formally admitted to Teacher Education.

A student will not be permitted to enroll in the courses in the professional sequence, teaching methods and the student teaching internship, unless full admission to the Teacher Education program has been earned and retained. Certain vocational programs may vary from this requirement due to state guidelines. Students should apply for admission to Teacher Education as early as possible in their programs.

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, 108 Gundersen, for College of Education students. Students wishing to enter teacher education programs within the College of Education must meet the required minimum grade-point average. (See "College of Education Admission Requirements.") If the student is enrolled in the Teacher Education program in the College of Agricultural Sciences and Natural Resources, Arts and Sciences, or Human Environmental Sciences, the student should check with the office of the department head for further information. In addition to completing the Declaration of Intention to Pursue a Program in Teacher Education form, the student should schedule the Teacher Education interview and register for the Preprofessional Skills Test (PPST) or meet the current OSRHE alternative criteria. Teacher Education interviews are generally scheduled during the first early laboratory and clinical experience. Registration booklets for the PPST are available from the University Testing and Evaluation Service, 111 North Murray and the Office of Teacher Education, 101 Gundersen.

After declaring an intention to pursue a program in Teacher Education, 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. Early laboratory and clinical experiences (45-clock hours minimum);

Full admission to Teacher Education must be achieved before the student can enroll in the remaining professional education sequence of learning theory, evaluation and methods. The student must meet all the following criteria:

1. The Preprofessional Skills Test. This test is offered to all Teacher Education students and is composed of mathematics, reading, English grammar and essay skills. A student may pass the PPST with the OSRHE established scores (mathematics 171, writing 172, reading 173) or meet the alternative criteria by scoring at the 50th percentile on the ACT earned prior to the completion of the first 12 college credit hours, or earning a 3.00 GPA in all hours of liberal arts and sciences courses (minimum of 20 hours). Contact the Office of Teacher Education, 101 Gundersen for specific information relative to alternative criteria. Information and registration for the Preprofessional Skills Test can be obtained from the University Testing and Evaluation Service, 111 North Murray and in the Office of Teacher Education, 101 Gundersen. A study guide for the test is available in the Reserve Room in the Library.
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 Teacher Education:

1. The student must have completed an approved Teacher Education program and hold a valid Oklahoma license or Provisional, Standard, or Professional Certificate; or

2. Students in a master’s program must (a) satisfy the departmental requirements for unqualified admission to the master’s degree program; (b) have a minimum overall GPA of at least 2.50; (c) complete the interview for Teacher Education; and (d) complete one semester credit hour of early laboratory and clinical experiences with a grade of "C" or better or a grade of "P." and (e) complete an orientation to Teacher Education course with a grade of "C" or better or a grade of "P." and (f) take all appropriate teacher certification course work which includes at least one course in sociological foundations, all early laboratory and clinical experiences (45 clock hours minimum), exceptional child, and human growth and development, with no grade lower than "C" or a "P" accepted in any of these courses.

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

The 2.50 GPA for all Teacher Education purposes will be calculated based on the University graduation and retention GPA policy. Grades of "I," "NP," "P," "X," "W" or the mark of "AU" or "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 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 "C" or "P"; a professional core GPA of at least 2.50 with no grade below "C" or "P" and a college/departmental requirement of at least a 2.50 GPA with no grade below "C" or "P."

Student Teaching Profile Application

The Student Teaching Profile Application form must be completed by the student the semester prior to the student teaching semester. The application forms are distributed at a meeting called by the coordinator of field relations and through the Office of Teacher Education. Students are notified of this meeting through consultation with advisers, the "Official Bulletins" section of The Daily 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 October and February. 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 field relations 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 course work. (See "Oklahoma Teacher Certification Testing Program.")

Criteria for student teaching placement for all Teacher Education students are:

1. Must have achieved and maintained full admission to a Teacher Education program;

2. Must have a current 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 core, major, and college/departmental requirements. No grade lower than a "C" or a "P" will be accepted in either of these areas;

4. It is recommended that the applicant have completed all preprofessional education course work which includes at least one course in sociological foundations, all early laboratory and clinical experiences (45 clock hours minimum), exceptional child, and human growth and development, with no grade lower than "C" or "P" accepted in any of these courses. It is recommended that professional sequence course work be completed to include learning theory, evaluation, and methods.

Required Grades in Student Teaching

A student must receive grades of "P" in all sections of student teaching in order to be recommended for a teaching license. Upon recommendation of the Entry-year Assistance Committee the student is eligible for recommendation for a standard certificate. A student assigned a grade of "F" in any section of student teaching will not qualify for a recommendation for a license or any level of certification.

Out-of-Area/Out-of-State Placements

A student requesting an out-of-area/out-of-state placement due to extenuating circumstances must have the approval of the coordinator of field relations 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 which 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 pursue an appeal through the Admission and Retention Committee. Information pertaining to the appeals process is available through the Office of Teacher Education, 101 Gundersen.

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 their 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 five times each year. Registration booklets are available in the Office of Teacher Education, 101 Gundersen. 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.

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.

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."

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). Applicants recommended by Oklahoma State University for a license, certificate or endorsement must have achieved grades of "P" in all sections of student teaching. A successful recommendation for certification by the Entry-year Assistance Committee will result in a recommendation for the standard certificate. A student assigned the grade of "F" in any section of student teaching will not qualify for a recommendation for a license or any level of certification. Applications for an Oklahoma license or certificate can be obtained in the Office of Teacher Education. Students seeking advisement concerning teacher licenses or certificates can be assisted by the coordinator of teacher certification in the Office of Teacher Education in 101 Gundersen.

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 satisfactorily complete the second year as an entry-year teacher, the Entry-year Assistance Committee will recommend noncertification for the candidate.
Engineers, engineering technologists, and architects, working side by side, constitute one of the most powerful agents for change in our society. New ways are found to control the environment, to utilize the resources and forces of nature, and to increase productivity of needed goods and services, in short, to improve the quality of life for all.

Most of the work of engineers, technologists, and architects is concerned with the conception, design, fabrication, maintenance and testing of devices, processes, installations, and systems that serve human needs. This work provides ample opportunity to express creativity. It requires an ability to make decisions.

The professionals and semi-professionals who will be largely responsible for the shape of the world in the year 2000 and beyond include those now in higher education. The power they will exercise makes an exciting prospect and presents a sobering responsibility. The easy problems are usually solved first and are now a part of history. Many difficult problems remain. The need for talented and highly trained people is obvious; one will be embarking on a lifetime of challenge if he or she decides to prepare for a career in engineering, engineering technology, or architecture at Oklahoma State University.

The curricula in each of the programs seek to provide the optimum combination of breadth in the enduring fundamentals that undergird technologically based society, and specialization in the branch or discipline in order to equip the student to contribute to solutions at the cutting edge of the science or technology involved. Curricula are continuously evolving to include current applications of the principles. With such a bridge between theory and practice, the educational experience should support one’s follow-on diverse interests and opportunities throughout the productive years of his or her life span.

Accreditation
The undergraduate engineering programs are separately accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC-ABET). Specifics of accreditation are found in the descriptions of the programs in the sections devoted to them on the following pages.

The Bachelor of Architecture program is accredited by the National Architectural Accrediting Board.

The undergraduate engineering technology programs are separately accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC of ABET). Specifics of accreditation are found in the descriptions in the section “Division of Engineering Technology.”

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 aerospace (an option of the B.S. in Mechanical Engineering), Biosystems Engineering with options in agricultural, biomechanical, environmental and natural resources, and food and bioprocessing; Chemical Engineering with options in environmental and premedical; Civil Engineering with an environmental option; Electrical Engineering with a computer engineering option; General Engineering; Industrial Engineering and Management; and Mechanical Engineering with an option in premedical.

Master of Biosystems Engineering,
amount of and grades in mathematics or mined by his or her score on placement Architecture and Technology is deter-

sioned by his or her score on placement Architecture and Technology is deter-

in the College of Engineering, Architecture and Technology is determined by his or her score on placement tests administered at enrollment, the amount of and grades in mathematics or

Doctor of Philosophy in biosystems engineering, chemical engineering, civil engineering, electrical engineering, general engineering, industrial engineering and management, and mechanical engineering.

School of Architecture:
Bachelor of Architecture, Bachelor of Architectural Engineering, Master of Architecture and Master of Architectural Engineering.

Division of Engineering Technology:
Bachelor of Science in Engineering Technology with programs in construction management technology (options in building and heavy), electronics technology (option in computer), fire protection and safety technology, general technology, manufacturing technology, mechanical design technology, and mechanical power technology.

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, students who can obtain high school credit in one unit of general chemistry and one unit of general physics, and students will benefit from taking calculus, 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. degree in engineering or architecture. General chemistry, college algebra and trigonometry credits may count toward B.S. degrees in engineering technology.

Class Placement
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 and grades in mathematics or chemistry completed in his or her high school program, and ACT test scores. When appropriate, students with a strong background can obtain academic credit by advanced standing examination or by College Level Examination Program (CLEP) tests.

General Education Requirements
For students in Engineering, Architecture and Technology, general education courses provide both a broadening of the education and essential background for addressing the critical issues in society. Students are encouraged to select courses that meet both of these objectives by following guidance specified in the sections devoted to each school. General education course lists are available in the Office of Engineering Student Academic Services to help students select appropriate courses.

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 freshman through senior students, and are awarded primarily on the basis of academic achievement and leadership potential. However, during the selection process consideration may be given to financial need and other factors. Freshman students should normally have an ACT composite score of 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.

Scholarship application forms for transfer students may be obtained by contacting the Office of Student Academic Services, CEAT, 101 Engineering North, OSU, Stillwater, OK 74078.

Freshman scholarship applications should be completed and on file by February 1 preceding the academic year for which the student expects to receive the scholarship in order to assure full consideration. The OSU Freshman Fee Waiver and Scholarship form should be submitted to the Office of University Scholarships. Since copies of these applications are forwarded to CEAT, a separate application is not required.

Continuing 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.

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 at this institution, and can be justified only in the most unusual circumstances. Normally, if the material for which such permission is sought is available at OSU, permission will not be granted, nor will retroactive permission be granted in any circumstances.

Calculators and Computers
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.

While students may find their own personal computers to be a convenience, computer labs are available to meet student needs. Those wishing to purchase their own computer should consider a 486/66 with math co-processor and 40 or more megabyte hard drive, or the Apple/Mac equivalent, as compatible with class requirements.

Special College Programs
Cooperative Education. The Cooperative Education program provides students work opportunities in a supervised environment that assures professional development. Work periods alternate with academic studies. Students enter the program at the end of their sophomore year and complete at least three work periods prior to graduation.

Scholars Enrichment Program. This program provides developmental experiences for a select group of gifted students that will develop their technical competence, world view, professional and public responsibility, and leadership skills. About 25 students are selected by application each year and interview to
Women in Engineering. Programs and resources are in place to develop and support female enrollment in the CEAT. Special counseling and advisement, an active Society of Women Engineers, summer programs in engineering for high school students, a Women in Engineering (WIE) Conference for high school and OSU students, and a vigorous recruiting effort are all directed at recruitment and retention of women in engineering, architecture and technology. Female faculty and a coordinator of WIE programs provide support to this program.

Multicultural Programs. These programs are directed at increasing the number of minority graduates from the CEAT, and increasing the understanding of diverse cultures on the part of all students. Included are programs for recruitment and retention of qualified minority students. Industrial support provides scholarships, summer employment, and supplemental funds for recruitment and retention of minority students. The Housing for Multicultural Engineering Students (HOMES) program provides a special living arrangement for freshman CEAT students of diverse cultures, with special programming provided, including collaborative learning workshops, speakers, faculty associates, clustering of students in classes, live-in staff, computers and other facilities on the floor, tutoring, and dinners with faculty. The purpose of this program is to build a sense of community and a support base of peers during the first year at OSU. A minority study lounge has been provided where students can study between classes, with access to computers and other resource materials.

Cultural awareness programming is designed to increase understanding of and sensitivity to the diverse cultures with which students will have to interact in today’s world.

Employment Service. A placement service assists students with obtaining on-campus interviews and job referrals for summer and permanent employment. Job vacancy listings, reference files, and resource materials on resume preparation, interviewing, and job search techniques, are available for student reference. Orientation meetings and various workshops are provided to prepare students for the process of seeking employment.

CEAT Residence Hall Program. Ceat floors have been established in the Kerr-Drummond residence hall for both men and women CEAT students. Students on these floors have access to computers, reference materials and test files. CEAT student staff live on the floors to provide programming, tutoring and monitoring of the program. Special activities are planned for the floors including events with faculty and other resource persons. This arrangement provides a community where students can study together, have access to peer tutoring, and serve as role models for other students. The atmosphere on these floors is very conducive to study.

Departmental Clubs and Honor Societies

- Alpha Epsilon (agricultural engineering honor society)
- Alpha Pi Mu (industrial engineering and management honor society)
- Alpha Rho Chi (architecture honor society)
- Amateur Radio Club
- American Indian Science and Engineering Society
- American Institute of Architects
- American Institute of Aeronautics and Astronautics
- American Institute of Chemical Engineers
- American Society of Agricultural Engineers
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- American Society of Safety Engineers
- CEAT Student Council
- Chi Epsilon (civil, architectural or general engineering honor society)
- Construction Management Society
- Construction Specifications Institute
- CEAT Student Council
- Eta Kappa Nu (electrical engineering honor society)
- Fire Protection Society
- Fluid Power Society
- Institute of Electrical and Electronics Engineers (two student branches)
- Institute of Industrial Engineers
- National Society of Architectural Engineers
- Omega Chi Epsilon (chemical engineering honor society)
- Pi Tau Sigma (honorary mechanical engineering society)
- Sigma Gamma Tau (honorary aerospace engineering society)
- Society of Automotive Engineers
- Society of Black Engineers, Technologists, Architects
- Society of Fire Protection Engineers
- Society of Hispanic Engineers
- Society of Manufacturing Engineers
- Society of Women Engineers
- Tau Alpha Pi (technology honor society)
- Tau Beta Pi (engineering students honor society)

Schools of Engineering

Each of the schools of engineering offer bachelor's, master of (designated) engineering, master of science, and doctor of philosophy degree programs. The curricular objectives in each engineering program are to develop each student's: (1) capability to delineate and solve in a practical way the engineering problems of society, (2) sensitivity to the socially-related technical problems which confront the profession, (3) understanding of the ethical characteristics of the engineering profession and practice, (4) understanding of the engineering responsibility to protect both occupational and public health and safety, and (5) ability to maintain professional competence through life-long learning.

The Professional School Concept

In accord with the professional nature of a career in engineering, a student entering OSU is 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 is considered for admission to one of the professional schools of the College to continue in the upper-division program. Upon meeting admission standards the student then pursues a curriculum leading to the B.S.
degree with an optional additional year leading to a master's degree in his or her discipline.

**Pre-engineering Program.** The pre-engineering program covers the freshman and sophomore years. The content of the pre-engineering program is similar for all engineering specialties (except architectural engineering), and includes course work devoted to mathematics through calculus and differential equations, communication skills, general chemistry, general physics, the engineering sciences commonly referred to as mechanics, thermodynamics and electrical science, and the social sciences and humanities.

**Bachelor of Science.** Upon formal admission to the professional school of his or her choice, the student proceeds through the junior and senior years of the degree program, fulfilling "Major Requirements" as listed on the degree requirements sheets in the publication *Undergraduate Programs and Requirements* that is considered a companion document to the Catalog.

**Master of Engineering.** The Master of (specific school) Engineering degree programs are designed to prepare the graduate for the practice of the engineering profession in industry and government. They are distinguished by particular emphasis on developing in students the ability to perform effectively in design and development work; the programs normally include internship experiences as a part of the academic process.

Admission to one of these programs also depends upon being accepted by one of the professional schools. The total program consists of all undergraduate degree requirements, and a 32-semester-credit-hour study program in graduate-professional status meeting Graduate College requirements for a Plan III master's degree. At least 24 semester hours must be at the 5000 level, including six to eight hours of professional practice.

The professional school plan of study when filed with the Graduate College becomes 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.

**Master of Science and Doctor of Philosophy.** These degree programs are available in each engineering school to prepare engineers for careers in advanced engineering, research and development. The programs are described under each school's headings, and in the "Graduate College" section of the Catalog.

**Admission Requirements**

All new engineering students are first admitted to the pre-engineering program. Transfer students will not be admitted if performance in the most recent semester of transfer credit, would have placed the student on probation if enrolled in pre-engineering at Oklahoma State University.

**Nonresident transfer students** will be admitted directly to pre-engineering if they appear to have the ability to make satisfactory progress toward an engineering degree as indicated by the following:

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.

For these purposes, all GPAs are calculated using only the last grade in any repeated course.

**Nonresident transfer students** 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 may be evaluated and, if qualified, will be admitted to pre-engineering.

Students transferring to pre-engineering from another major at OSU or University Academic Services must meet the same requirements for admission as a student transferring from another college or university.

Transfer students who have completed all lower-division course requirements may, with the school head's permission, be allowed to take selected 3000-level engineering courses while in pre-engineering status.

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.

**Admission to the Professional Schools.** In each school of engineering the lower-division course work is devoted to qualifying the student for admission to the professional school.

To be admitted to one of the professional schools of engineering, the student must have:

1. Completed a minimum of 60 semester credit hours in an accredited institution of higher learning.
2. Demonstrated an acceptable level of competence in subject material comparable to that covered in Pre-engineering, i.e., General Education and Common Pre-engineering. Such demonstration may be by completion of course work or by examination with not more than half the requirements satisfied by examination.
3. Been formally accepted by a professional school.

An acceptable level of competence for admission to a professional school may be demonstrated by:

a. Completion of the Pre-engineering requirements as designated on the flow chart corresponding to the student's matriculation date and major, with an overall grade-point average of 2.30 or higher in these courses. Students may be deficient in no more than nine of these hours, and must have completed the required sequences of calculus, general physics, general chemistry, English composition, and at least two engineering science courses.

b. Final grades of "C" or better in all required English composition courses.

c. Completion at OSU of at least 12 semester credit hours of courses required for the degree, with a grade-point average of 2.30 or higher in these courses. This must include at least nine hours of technical subjects with a GPA of 2.50 or higher.

d. Achievement of an overall grade-point average of 2.50 or higher in the required mathematics, physics, chemistry, engineering science and engineering courses completed prior to admission to a professional school and final grades of "C" or better in each of these courses.

For these purposes, all GPAs are calculated using only the last grade in repeated courses. Individual schools may impose higher standards for admission. Currently, the School of Electrical and Computer Engineering requires a 2.60 and 2.70 respectively where 2.30 and 2.50 are indicated in a., c., and d. above.

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 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.

Admission to Graduate-Professional Status. To be admitted to graduate-professional status in a professional school in the CEAT, a student must have satisfied requirements for a B.S. degree in engineering, meeting the criteria of the Engineering Accreditation Commission 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

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 ENGL 3323, to meet both the General Education requirement for English and the College requirement for technical writing.

**Humanities and Social Science.** Engineering students must complete a total of 18 semester credit hours to meet this requirement, which exceeds the minimum requirements stipulated by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. By taking American history and political science, six additional hours of social and behavioral sciences, and six hours of humanities, the 18 hours will meet the University's requirements in these areas. Humanities and Social Science courses must be selected from the CEAT approved list in order to assure compliance with accreditation requirements for both breadth and depth.

CEAT 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.

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 are eligible for the Honors Program beginning with their first enrollment at OSU as freshmen. Eligibility is based on a composite ACT score of 27-29 with a high school grade-point average of 3.75 or higher, or an ACT score of 30 or higher with a 3.50 high school grade-point average. Students other than new freshmen may enter the Honors Program if they have a cumulative grade-point average of at least 3.25. Students should contact the OSU Honors Program, 509 Edmon Low Library, for eligibility forms.

Honors Recognition. The General Honors Award is earned by completing a minimum of 21 honors credit hours with grades of "A" or "B." At least three honors credit hours must be completed in each of four of the following areas: (1) English, speech communication and foreign languages (2000 level or higher); (2) humanities, (3) mathematics, statistics and computer science, (4) natural science, (5) social science, and (6) other courses with honors credit. Three of the 21 credit hours must be in a special honors seminar or an interdisciplinary honors course. A 3.50 or higher cumulative grade-point average is required at the time of the award. Completion of the General Honors Award is noted on the student's official transcript.

The College Honors Award is earned by completing a minimum of 12 honors credit hours in upper-division courses with grades of "A" or "B." The 12 credit hours must include a senior honors thesis or senior honors project with a public presentation of the results. A 3.50 or higher cumulative grade-point average is required at the time of the award. Completion of the College Honors Award is noted on the student's official transcript.

Students who complete a minimum of 39 honors credit hours with grades of "A" or "B" and have received both the General Honors Award and the College Honors Award will be granted the bachelor's degree with honors. This recognition is reflected on the student's official transcript and on a special honors diploma.

Academic Advising

The College's Office of Student Academic Services provides advisement for all pre-engineering students. When a student has gained admission to a professional school of engineering, he or she will be assigned a faculty adviser in the school.

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.

Each student and his or her adviser must carefully select elective courses to meet the curriculum objectives and accreditation criteria. Specific criteria include appropriate computer-based experiences, knowledge of probability and statistics, competence in written and oral communications, an understanding of ethical, social, economic and safety considerations, and engineering design experiences that are integrated throughout the curriculum. The engineering design experiences begin with ENGR 1322 and culminate with a major engineering design experience specified on the degree requirement sheet. The adviser assists the student in this effort and tries to assure accuracy and compliance; however, the ultimate responsibility for meeting degree requirements rests with the student.

**Biosystems and Agricultural Engineering**

Professor and Head Billy J. Barfield, Ph.D., P.E.

The School of Biosystems and Agricultural Engineering is administered jointly by the College of Engineering, Architecture and Technology and the College of Agricultural Sciences and Natural Resources.

Biosystems engineers are professionals who protect the environment and preserve natural resources by creating and adapting engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of food, feed, fiber and other biological products. Biosystems engineering students study engineering, physical, mathematical and biological sciences. Biosystems engineering courses apply mathematics, basic engineering and science to create and design new systems and equipment for biological production and processing. Students work with computers on simula-
tion, control and design of bioenvironmental projects. Required social studies and humanities courses help prepare students to work with people. These people skills are important for advancement into management level positions, a transition that often occurs early in a biosystems engineer’s career.

A wide variety of employment opportunities are available for biosystems engineers in industry, public service and education. Some of these opportunities include positions in governmental agencies, consulting, machine industry, manufacturing and installation, and electric power management industries. Biosystems engineers have careers in foreign countries as well.

Students interested in a degree in biosystems engineering may initially enroll in either the College of Engineering, Architecture and Technology or the College of Agricultural Sciences and Natural Resources. Students who enroll in the College of Agricultural Sciences and Natural Resources should request a biosystems engineering adviser and transfer to the College of Engineering, Architecture and Technology by the end of their first semester.

Biosystems engineering courses for juniors and seniors integrate the engineering sciences with biological sciences and teach students to design solutions to real problems of society. Students work both as individuals and in teams to solve real world design problems provided by industrial firms that hire biosystems engineers. Design experiences are developed in one or more of the following areas: environment and natural resources, food and bioprocessing, biostatistical and general agricultural engineering.

In addition to the 76 semester credit hours of common requirements for engineers, biosystems engineering students take courses in electronic applications, instrumentation, watershed hydrology, food control, drainage and irrigation, environmental engineering, power and machinery, structural design, processing and food engineering. The program is accredited at the basic level by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Each student in consultation with his or her adviser must carefully select elective courses to assure that all accreditation criteria including those for engineering design are satisfied.

The program is accredited at the basic level by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the program criteria for agricultural and similarly named engineering programs.

Graduate Programs

The School of Biosystems and Agricultural Engineering offers three programs leading to post-baccalaureate degrees: Master of Biosystems Engineering, Master of Science and Doctor of Philosophy. The Master of Biosystems Engineering program places emphasis on design and internship in engineering experience. The Master of Science and Doctor of Philosophy degrees emphasize research and development.

Excellent facilities are available for students to explore research and design in bioprocessing and food engineering, physics of plant and animal environments, non-point-source pollution control, hydrology, water resources, water quality, air quality, wind erosion, machine development for biological systems, microelectronics, intelligent machines for biological production, irrigation design, and hydraulics.

Research projects are supported by the Agricultural Experiment Station and by state and federal grants. A well-trained faculty, many of whom are registered professional engineers with research, consulting and design experience, guide the graduate students’ activities and plan programs to meet students’ needs. Graduate students design experiments and special equipment to conduct their work. They are expected to demonstrate, by supporting research or by designs, the ability to identify a problem, define alternatives, propose a solution, organize a design 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 curricu-

Chemical Engineering

Amoco Chair and Head Robert L. Robinson, Jr., Ph.D., P.E.

Chemical engineers apply chemical, physical, and engineering principles to solve important problems and to supply vital materials for our technology-based civilization. Their work includes pharmaceuticals, fuels, industrial chemicals, bioengineering and much more. It includes energy conservation and pollution control. The emphasis on chemistry and the chemical nature of everything people use is what makes chemical engineers different from other kinds of engineers.

Chemical engineers often find themselves defining a problem or product, developing a process to do what is needed, and then designing the plant to carry out the process. After the plant is started, chemical engineers will commonly manage operations, oversee equipment maintenance, and supervise control of product quality. They troubleshoot the problems which hinder smooth operations, and they plan for future expansions or improvements. Their training and knowledge make them well qualified to market the products from a plant, the processing equipment for it, or even the complete plant itself.

The varied background and experience of chemical engineers make them ideally suited for advancement into top-level managerial and executive positions.

The goal of the School of Chemical Engineering is to provide the best possible education to students so that they are competitive in employment, in advanced studies and are prepared for a
life-time of self-study and continued improvement. More specifically, the goals are:

1. To develop to the maximum extent the capability of the student to solve in a realistic, professional way the problems of society that are of public interest and concern;
2. To provide for the student both a sufficiently broad background and enough depth of specialization that he or she will be well-prepared to excel in any of the many fields of chemical engineering endeavor—marketing, manufacturing, design, research, development, management;
3. To provide the graduate with a level of technical competence such that he or she can compete favorably in employment and academic programs with graduates from other quality professional schools of engineering;
4. To prepare the student to maintain technical competence in his or her chosen area of chemical engineering by self-study of the current literature, new books and by study in continuing education courses; and
5. To encourage the student to maintain an open-minded attitude such that over the years, he or she will be flexible in outlook for opportunities to apply chemical engineering knowledge to new and unique fields.

The academic preparation of chemical engineers for such a broad variety of careers must be based on a strong foundation in the basic sciences and mathematics. Computer competency is a must. Fundamental professional courses follow to provide the student an opportunity to apply the basic sciences to chemical engineering problems. Engineering design and laboratory courses integrate the more fundamental studies and demonstrate that engineering is a process of assembling knowledge from many fields and sources into a practical answer to a real problem. At the bachelor's (B.S.) level, three emphasis areas are offered: (1) the regular course emphasis prepares a graduate for a wide range of employment opportunities; (2) the premedical emphasis is for those who wish preparation for medical school or seek employment in medically-related professions; and (3) the environmental emphasis is for those who wish to emphasize environmentally-related studies. Each area prepares a student for success in M.S. or Ph.D. study at OSU or at other universities. More complete descriptions of exact degree requirements for the bachelor's degrees are given in the document Undergraduate Programs and Requirements. All of these emphasis areas are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the program criteria for chemical and similarly named engineering programs.

Upon completing the B.S. studies the qualified student is encouraged to continue in the master's program.

Graduate Programs

The School of Chemical Engineering offers programs leading to post-baccalaureate degrees: the Master of Science degree, and the Doctor of Philosophy degree. A program of independent study and research on a project under the direction of a member of the Graduate Faculty will be satisfactorily completed by all graduate students. For the Master of Science candidate, the project may result in a thesis. For the Doctor of Philosophy candidate, the project will result in his or her dissertation.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from a chemical engineering curriculum approved by the Accreditation Board for Engineering and Technology (ABET). Graduates from other curricula should submit transcripts to the head of the School of Chemical Engineering for evaluation.

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 5123, 5213, 5743, 5843, and either 5423 or 5633.

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 chemical engineering courses must include CHENG 6023, 6113, 6223, and 6543 and six hours of credit in other 5000- and 6000-level CHENG courses. Each student is responsible for consultation with his or her advisory committee in preparing the study plan.

Civil and Environmental Engineering

Professor and Head Robert K. Hughes, Ph.D., P.E.

The exceptional diversity of professional practice in civil engineering presents many career opportunities for students well-founded in the physical sciences, mathematics, geology and biology.

The concern of civil engineers is a person'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 treatment and distribution of water and for the collection and treatment of sewage and industrial waste, dams and hydroelectric works, airports and terminals, structures of every kind including buildings, bridges, towers, industrial plants, 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. Engineering theory and principles are developed in a way that will encourage their application to the solution of practical problems. Elective courses give
experience in the solution of typical problems and develop the judgment and confidence of the student engineer.

The goals of the School are to provide a curriculum that is well balanced among the six major areas of civil engineering practice; to provide access and exposure to laboratory, computational and design experiences that will enhance performance in the practice of civil engineering; to enhance communicative skills and an understanding of management principles; to encourage the development of social relationships and experience in team participation; and to ensure student understanding of the ethical and societal responsibilities of professional practice. Program curricula requirements are outlined in the publication Undergraduate Program and Requirements that is considered a companion document to the Catalog. These programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the criteria for civil and similarly named engineering programs.

Some degree of specialization is provided through the choice of elective courses in structures, engineering mechanics, transportation engineering, soil mechanics and foundations, construction engineering and management, environmental engineering and water resources. There is a designated emphasis for those students wishing to concentrate more heavily in the environmental area of practice. Strong support for various parts of the program are given by the departments of Industrial Engineering and Management, Mechanical and Aerospace Engineering, Agronomy, Chemistry, Geology, and Microbiology.

Graduate Programs

The School of Civil and Environmental Engineering offers five programs leading to post-baccalaureate degrees—the Master of Civil Engineering degree, the Master of Environmental Engineering degree, the Master of Science degree in civil engineering, the Master of Science degree in environmental engineering, and the Doctor of Philosophy degree. The Master of Civil Engineering and the Master of Environmental Engineering degrees are graduate professional degrees with increased emphasis on professional practice through a broad spectrum of management, economic and technical studies and the incorporation of actual engineering design experience before graduation. The Master of Science degree, on the other hand, is characterized by a higher degree of technical specialization in a particular area of study. The Doctor of Philosophy degree is designed to prepare a student for research and for the teaching profession in engineering.

Major areas of study in the School are applied mechanics, structural analysis and design, transportation, construction engineering and management, geotechnical engineering, water resources, and environmental engineering. Research in all major fields is continuously pursued. Master of Civil Engineering candidates may choose either to specialize or to engage in a broadly based program of study, in accordance with an approved and purposeful plan of study.

Admission Requirements. Candidates for the Master of Science or Doctor of Philosophy degree must have graduated from a civil engineering curriculum accredited by the Accreditation Board for Engineering and Technology. Graduates from other curricula and schools should submit transcripts to the head of the School of Civil and Environmental Engineering for evaluation. Admission to the Master of Science in environmental engineering degree program is permitted for students who meet the minimum prerequisites as established by the School of Civil and Environmental Engineering.

Degree Requirements. All degree programs follow an approved plan of study that must be submitted at a designated time. 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 implied by the title of the degree and specified by the University.

The Master of Science degree in either civil or environmental engineering requires the completion of at least 30 semester credit hours beyond the bachelor's degree, including a research thesis for which not more than six semester credit hours may be granted. The non-thesis option (32 semester credit hours) described in the "Graduate College" section may be permitted at the discretion of the student's adviser.

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.

Electrical and Computer Engineering

Professor and Head Rajnikant V. Patel, Ph.D.

Electrical Engineering

The electrical engineering program provides the fundamentals for a career in many related areas. All around is seen the astounding impact of microelectronics on consumer products such as calculators, electronic watches, TV games, home computers and microwave ovens, but the future impact will be even more astounding on worldwide satellite communications, energy conservation, automation of industrial plants, oil and gas exploration, electrical power generation and distribution, to mention a few.

The curriculum is planned to provide skills in the analysis of engineering problems and the design of solutions to those programs. It provides experience in working as a team member on design projects. Emphasis is placed on the development of both written and oral communications skills and the concept of professionalism including the importance of life-long learning.

The undergraduate electrical and computer engineering program at Oklahoma State University prepares each graduate for a life-long professional career. During the first two years, students complete a carefully designed pre-engineering program consisting of mathematics, physical sciences, engineering sciences and selected courses in the humanities and social sciences. During the final two years of the program, each student concentrates his or her study on electrical and computer engineering subjects and can elect from the following areas: computer engineering, electronics, energy systems, communications, control systems, electromagnetics, solid state devices, optics, and network theory/signal processing. Specific elective courses must be selected to assure that the design experience is integrated throughout the curriculum. The design experience is integrated throughout the program, leading to two major design courses at the senior level.
Computer Engineering

A special program option in computer engineering is offered by the School of Electrical and Computer Engineering. This option is designed for students who have a strong interest in computers and desire to gain a full understanding of both the electronic hardware and the programming software aspects of modern computer systems. A student in computer engineering will also gain a detailed knowledge of one or more applications where computers are being used as integral components of advanced engineering systems; examples are instrumentation and test facilities, communication systems, power systems and process control systems. Students in computer engineering will work directly with microprocessors, microcomputers, and minicomputers and develop special electronic circuits for interfacing these computers to various peripheral devices.

In addition to the laboratories devoted to research, separate instructional laboratories give students "hands-on" experience in microcomputers, minicomputers, digital logic design, electronics, electrical machinery, networks, instrumentation and electromagnetics. In most instances, the student is guided through laboratory exercises which are closely related to classroom lectures. Here the student has the opportunity to verify theoretical principles and design concepts presented in the lectures. In other courses, the laboratory formats are more open-ended, allowing the student to experiment freely and exercise individual discretion in discovering experimental results.

The School of Electrical and Computer Engineering offers a full range of undergraduate and graduate program choices. 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.

This program, including the computer engineering emphasis area described above, is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the criteria for electrical and similarly named engineering programs.

Graduate Programs

The School of Electrical and Computer Engineering offers two graduate degrees: Master of Science and Doctor of Philosophy. Students interested in a Master of Electrical Engineering degree program should contact the department head.

The Master of Science degree is designed for students interested in careers in industry and government service that emphasize advanced design, development, and research methods for high technology. This degree incorporates additional advanced course work and on-campus creative activities.

The Doctor of Philosophy degree is designed to prepare the student for high-level research and 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, parallel processing, optoelectronics, and lasers.

In addition, students may elect a multidisciplinary program that crosses departmental lines and emphasizes the application of electrical engineering and systems theory to complex problems involving the interaction of engineering systems and technology with social, economic and environmental processes.

Admission Requirements. Admission to the Graduate College, as described under "General Regulations" in the "Graduate College" section of the Catalog is the first step for those students proceeding toward advanced degrees. Graduation with high scholastic performance from an electrical engineering curriculum accredited by the Accreditation Board for Engineering and Technology qualifies the student for admission to the School of Electrical and Computer Engineering as a candidate for any of the three advanced degrees offered.

Graduates from non-engineering fields such as mathematics, physics and computer science are also admitted to the School of Electrical and Computer Engineering M.S. and Ph.D. graduate programs, if an evaluation of their transcripts indicates they are prepared to take graduate-level course work in electrical engineering, or can be expected to do so after a reasonable amount of remedial course work. This condition also applies to graduates of unaccredited engineering programs and engineering technology programs.

Degree Requirements. The Master of Science degree is awarded to those students who successfully complete an approved plan of study under one of two possible options. If a thesis is written, 30 semester credit hours are required, including six hours credit for the thesis. If no thesis is written, 32 semester credit hours are required, including two hours credit for a creative activity. To be approved, a plan of study will include, as a minimum, 18 hours of 5000-level courses in electrical and computer engineering. Most plans of study include additional 5000-level courses, depending upon the background and particular educational goals of the student, and the minimum stated above is allowed only when a specific interdisciplinary plan of study is approved by the faculty. Each student is encouraged to include courses in supporting disciplines such as mathematics, computer science, statistics, business or other engineering fields. In certain cases, remedial work in undergraduate electrical and computer engineering will be required in addition to the 30-32 hours specified above.
The Doctor of Philosophy degree is granted in recognition of high achievement in scholarship in course work selected from the broad field of electrical engineering, and an independent investigation of a research problem in a chosen field of specialization that leads to a contribution to knowledge, as presented in a dissertation. For this degree the Graduate College requires a minimum of 90 credit hours for acceptable academic work beyond the bachelor’s degree, including credit for the dissertation.

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

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 from four major engineering disciplines (civil, electrical, industrial, and mechanical). The goal is to provide the student with a background of sufficient breadth and depth to function, after adding specific knowledge on the job, in any of the four disciplines, and particularly when integrating expertise between or among the disciplines.

As a professional with such an interdisciplinary background, the general engineer is prepared to analyze, design and synthesize solutions in a technically expedient manner, considering the economics of design or process, and 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 takes classes 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, that will assure a more competitive level of competence in more than one of the engineering disciplines.

The program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the general and nontraditional program criteria.

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 specialization and is appropriate preparation to enter doctoral studies.

The Doctor of Philosophy degree is a research-oriented degree designed to prepare the candidate for a career in teaching or research.

Graduate study in general engineering follows the undergraduate pattern of combining course work from civil, electrical, industrial and mechanical engineering. Research is normally pursued on a topic combining two or more areas.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires completion of an undergraduate degree with a level of performance that assures high probability of satisfactory completion of the graduate program. While graduation from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology is preferred, 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 as described previously under "Master of Engineering." A student may enter the program at any level for which he or she is qualified if 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 Graduate College, 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 in a program that integrates upper-division and graduate-level requirements. It includes not fewer than 102 semester credit hours of course work and an internship period. At least 32 semester credit hours must be included in the graduate professional study plan, and of these, 11 or more semester credit hours must be in design, as defined by the Accreditation Board for Engineering and Technology, and 15 semester credit hours shall be in course work at the 5000 level or above. The plan of study for the graduate professional (third) year should include eight semester credit hours of internship/professional practice; and three semester credit hours of humanities beyond the undergraduate requirements. 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 a specific objective for each candidate. The Master of Science degree usually 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 of 32 semester credit hours (Plan III) designed to produce the breadth expected of a general engineer.

The Doctor of Philosophy degree in general engineering requires the completion of not fewer than 90 semester credit hours beyond the bachelor's degree, or 60 semester credit hours beyond a master'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: six to nine 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...
Industrial Engineering and Management

Professor and Head Timothy J. Greene, Ph.D.

Industrial engineering and management 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 and management 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 consulting firms, 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 advisor 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.

The program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the criteria for industrial and similarly named engineering programs.

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, manufacturing systems analysis and design, operations research, simulation, ergonomics, production control, quality assurance, economic analysis, energy and hazardous waste 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 director of graduate programs for 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 at least 33 semester credit hours beyond the bachelor's degree, including an internship or professional practice of six semester credit hours.

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
The Doctor of Philosophy degree requires the completion of at least 90 semester credit hours of course work beyond the bachelor's degree or 60 semester credit hours of course work beyond the master's degree, including normally about 20 semester credit hours for a research thesis. In addition, the candidate must complete six semester credit hours of course work in an area such as mathematics, statistics, experimental techniques, or research methodology (as specified by the advisory committee).

The Master of Manufacturing Systems Engineering degree requires the completion of 33 semester credit hours beyond the bachelor's degree and normally includes six credit hours based upon an internship in industry.

**Mechanical and Aerospace Engineering**

Professor and Head Lawrence L. Hobrock, Ph.D., P.E.

Mechanical engineering is a professional discipline which involves the invention, design, and manufacture of devices, machines and systems that serve the ever-changing needs of modern society.

Mechanical engineering is an exceedingly diverse field which is not identified with or restricted to any particular vehicle, device or system. Mechanical engineers are vitally concerned with all forms of energy production, utilization and conservation. They deal with everything mechanical, whether it is small or large, simple or complex-from power lawn mowers to automobiles, fuel cells to nuclear power plants, gas turbine engines to interplanetary space vehicles, artificial limbs to life support systems, robotic manipulators to complex automatic packaging machines, precision instruments to construction machinery, household appliances to mass transit systems, and heating and air-conditioning systems to off-shore drilling platforms. In virtually every organization where engineers are employed, mechanical engineers are included.

This program, including the premedical emphasis area, is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under the criteria for mechanical and similarly named engineering programs.

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 people to the moon and continues to lead in the expansion of frontiers deeper into space and into the ocean's depths. Because of their unique backgrounds in aerodynamics and lightweight structures, aerospace-oriented mechanical engineers are becoming increasingly involved in solving some of society's most pressing and complex problems, such as high-speed ground transportation and pollution of the environment.

The aerospace option in mechanical engineering is separately accredited as an aerospace group program by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Program criteria developed by the American Institute of Aeronautics and Astronautics as well as by the Society of Mechanical Engineers have been applied in the accreditation process.

The goals of the mechanical engineering B.S. degree programs, including the aerospace and premedical option, are to educate engineers who are both well prepared to practice engineering upon graduation and who have sufficiently rigorous development to undertake graduate work. Because mechanical engineering is perhaps the broadest of all engineering disciplines, the program provides not only excellent grounding in all engineering fundamentals, but also allows some flexibility in selecting controlled technical electives to suit the student's interests. However no one area may be unduly emphasized at the expense of another. For the aerospace and premedical options, prescribed course work has been selected to provide students with more focused development. Graduates of these programs are fully competent as mechanical engineers, including their abilities in design, but also competent in their areas of concentration.

As a fundamental component of all B.S. programs, engineering design is strongly emphasized in the junior and senior years, such that a minimum of 16 credit hours of design, integrated throughout the last two years of study, must be taken by each student. In fact, with the exception of only a few courses, each MAE course at the 3000 and 4000 levels includes some design content, ranging from a minimum of one-half to a maximum of four credit hours of design content. The objective is to provide a total design experience, beginning with ENGR 1322, integrated throughout the upper level course work; the design experiences grow with the students' development. The objective is to develop graduates who are competent in the essential aspects of engineering design. Dominant meaningful design experiences include a three credit course at the 3000 level dedicated entirely to engineering design, a three credit course at the 4000 level (selected from a group of three courses) with two credit hours devoted to design, and a four-credit major engineering design experience at the 4000 level. The major design experience focuses each student's attention upon professional practice, and draws upon previous course work. This course provides each student with an experience in the process of devising a system, component, or process to meet a need. The design experiences include the fundamental elements and features of design with realistic constraints such as economics, safety, reliability, social and environmental impact, and other factors.

The broad background and problem-solving ability of mechanical engineers make them suited to engage in one or more of the following activities: research, development, design, production, operation, management, technical sales, patent law and private consulting. Versatility is their trademark. A bachelor's degree in mechanical engineering is also an excellent background for entering other professional schools such as medicine, dentistry, law or business (M.B.A.). A formal premedical option is available for students wishing to follow this avenue of approach to medical school.

In the professional school, mechanical engineering students extend their study of the engineering sciences and consider applications of fundamental principles and analysis tools to the solution of real technological problems of society. Students make extensive use of modern electronic digital computers in virtually every course in their programs. Some design courses involve students in the solution of authentic, current and significant engineering problems provided by industrial firms, such as 3M, General Dynamics, Schlumberger, Seagate, Hilti, Mercury Marine, Purolator, Moore Business Forms, and Mobil. Students may also help aggressive, smaller firms that may need assistance with the development of new products. These industrial firms also are representative of those hundreds of firms that employ mechanical engineers with the aerospace option.

The student designs, with the guidance of an adviser, an individualized program of study consistent with his or her interests and career plans. Some students terminate their studies with a bachelor's degree, while others receive one of several graduate degrees.
Graduate Programs

The School of Mechanical and Aerospace Engineering offers programs leading to the Master of Mechanical Engineering degree, Master of Science degree, and the Doctor of Philosophy degree. The Master of Science degree and the Doctor of Philosophy degree prepare the graduate for research/development positions in industry and government, or for the teaching profession in engineering. These degrees are distinguished by the incorporation of a research component.

The Master of Mechanical Engineering degree prepares the graduate for engineering practice and is distinguished by its incorporation of an off-campus internship in industry to give the student engineering design experience before graduation.

Admission Requirements. Admission to the Graduate College is required of all students pursuing the M.Mech.E., M.S., or Ph.D. degree. Graduation from a mechanical or aerospace engineering curriculum accredited by the Accreditation Board for Engineering and Technology, with scholastic performance distinctly above average, qualifies the student for admission to the School of Mechanical and Aerospace Engineering as a candidate for the M.S. and Ph.D. degrees. Graduates from disciplines other than mechanical or aerospace engineering may be admitted if an evaluation of their transcripts by the School of Mechanical and Aerospace Engineering indicates they are prepared to take graduate-level course work in mechanical engineering, or can be expected to do so after a reasonable amount of prerequisite work.

Admission to the Master of Mechanical Engineering degree program is for students who meet the prerequisites stated under "Master of Engineering." A student may enter the program at any level for which the individual is qualified provided he or she meets the minimum admission criteria and is accepted by the School of Mechanical and Aerospace Engineering.

Degree Requirements. All degree programs follow an approved plan of study designed to satisfy the individual goals of the student, while conforming to the general requirements of the School of Mechanical and Aerospace Engineering and the Graduate College.

The Master of Mechanical Engineering degree requires 24 semester hours of approved graduate-level course work and a prescribed internship. As a result of the internship, a written report acceptable to the faculty must be submitted for completion of the degree requirement.

The Master of Science degree program with the thesis option requires 24 semester credit hours of approved graduate-level course work, and a suitable research thesis of six semester credit hours. The non-thesis option requires 32 semester credit hours of which three 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.")

School of Architecture

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

The School of Architecture, founded in 1909, offers professional degree programs in both architecture and architectural engineering. The integration of these programs through shared faculty, facilities and course work is a major strength of the School. It is one of the few such integrated programs in the United States, and as such produces graduates who are particularly prepared for the integrated team processes used in professional practice. The School of Architecture is a primary unit in the College of Engineering, Architecture and Technology, and therefore benefits from excellent state-of-the-art resources which significantly enhance the School's professional programs.

The School of Architecture is dedicated to providing a high quality and focused professional education to students whose career goals are to enter the practice of architecture or architectural engineering. Professional and liberal study electives provide opportunities for educational breadth or depth and a possible double degree in both architecture and architectural engineering.

The employment demand for OSU graduates consistently exceeds the supply potential of the School. Oklahoma State University graduates are recruited by the leading architectural and architectural engineering firms both in Oklahoma and nationally. The Oklahoma State University School of Architecture is particularly proud of having among its alumni many of the leaders of the best firms in the country, an AIA Gold Medalist (the highest award given to an architect), and presidents of the American Institute of Architects (AIA) and the National Architectural Accreditation Board (NAAB).

Mission and Goals. Architecture is the difficult and complex art and science of designing and building a setting for human life. It is unique among today's professions in that its successful practice requires a blend, in roughly equal shares, of traits normally considered less than compatible: human empathy, artistic creativity, technological competence, and organizational and economic acumen. In contrast to other fine arts, architecture is rarely self-generated; it is rather a creative response to a stated or perceived human need. It must, therefore, be more user-oriented than fine art alone and more humane than pure science. Its design solutions must avoid the total subjectivity and detachment of other arts while striving to be functionally, technically and economically objective and sound. Yet, in a seemingly insoluble contradiction, the keenest technological and economic functionality will fall far short of becoming architecture unless it also strongly appeals to human spiritual and emotional values. When one thinks of the environment, one cannot help but see or recall architectural images: pyramids in Egypt, Greek and Roman temples, Gothic cathedrals, medieval castles, industrial cities, modern skyscrapers and dwellings or entire cities which significantly express the culture and values of the people who live or lived there.

The fundamental mission of the School of Architecture is to focus its unique combination of accredited programs in architecture and architectural engineering to prepare and inspire students for the vital professional leadership roles and responsibilities required to shape the physical environment and to have a positive impact on the social, economic and cultural qualities of life in Oklahoma and the entire international context.

The School of Architecture endeavors to instill in each individual a sensitivity to human needs. A genuine concern for
quality, integrity and high ideals, a positive attitude for life-long learning, and an appreciation for one's own self-esteem.

The School's primary goal is to provide excellence in professional education for students preparing to enter the private practice of architecture or architectural engineering. This professional focus is to educate not just qualified candidates for the degree, but graduates who, during their careers, will be licensed professionals and will assume positions of leadership within the profession and society.

**Accreditation.** The School of Architecture offers two separately accredited professional degree programs. The Bachelor of Architecture degree, B.Arch., is accredited by the NAAB. The Bachelor of Architectural Engineering degree, B.Arch.E., is accredited by EAC/ABET. Both programs require a minimum of five years of study to complete.

### Architecture

Architecture is the complex synthesis of creatively solving problems involving both art and science through the disciplined orchestration of image making, activity organization, technological applications, legal constraints, and budgetary parameters which together express culture, enhance quality of life and contribute to the environment.

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 highest 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.

Most states require that an individual intending to become an architect hold an accredited degree. There are two types of degrees that are accredited by the National Architectural Accrediting Board: (1) the Bachelor of Architecture, which requires a minimum of five years of study, and (2) the Master of Architecture, which requires a minimum of three years of study following an unrelated bachelor's degree or two years following a related preprofessional bachelor's degree. These professional degrees are structured to educate those who aspire to registration/licensure as architects.

The four-year, preprofessional degree, where offered, is not accredited by NAAB. The preprofessional degree is useful for those wishing a foundation in the field of architecture, as preparation for either continued education in a professional degree program or for employment options in architecturally related areas.

### Architectural Engineering

The architectural engineering program focuses on the creative and analytical solutions to the technological aspects of building design.

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.

### 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 (pre-architecture). Upon completion of these two years, the best qualified students are selected, upon application, by the School for admission to the upper division. Admission is based upon academic achievement and professional potential. Admission criteria are subject to annual review by the School and may be obtained directly from the School. As a minimum, a student must have completed 60 semester credit hours, all required architecture courses specified for the first two years with grades of "C" or better, and maintained an overall GPA of 2.30 or higher. Furthermore, first preference will be given to students who have completed ARCH 2024 prior to admission.

Transfer students are required to furnish transcripts and course descriptions for previous 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.

**General Education.** Opportunities to satisfy General Education requirements with required courses in the architecture curriculum include American Urban History (HIST 4503), used to meet requirements in Social and Behavioral Sciences. At least 12 semester hours of basic science and mathematics can be counted toward General Education requirements, and required upper-division course work in History and Theory of Architecture can be used for General Education credit.

**Electives.** Electives should be selected to comply with the appropriate undergraduate degree requirements for the program. (See "Changes in Degree Requirements" in the "Academic Regulations" section of the Catalog.) These requirements assure compliance with institutional and accreditation criteria.
Student-faculty interaction, the student-body.

Projects submitted for admission to the graduate program are considered for admission beginning the following fall semester only.

Student Portfolios. For the Master of Architecture program, photographic examples of work performed in architectural design and other professional courses or actual practice are to be submitted with the admissions application for review by the School. Slides are not acceptable. Portfolios should be mailed directly to the School to arrive no later than February 15. Candidates for admission to the Master of Architectural Engineering program are not required to submit a portfolio.

Regulations and Procedures. Regulations and procedures as established by the Graduate College for a master’s degree apply to the School’s graduate programs, except as otherwise noted in the School’s current program description. This description is reviewed by the School annually, and may be obtained directly from the School.

For further information, contact the School of Architecture, Oklahoma State University, Stillwater, Ok 74078-1085.

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 curricula at OSU are four-year programs which lead to the Bachelor of Science in Engineering Technology. Graduates of the program are known as “technologists” and are trained either to assist engineers or to provide independent support for engineering activities. The technologist receives an intensive education in his or her technical specialty and great depth in mathematics and technical sciences. The program provides breadth in related technical, communication and socio-humanistic studies. A "master of detail," he or she is capable of independent action in performance of technical activities and is frequently involved as a coordinator, expediter or supervisor of other...
technical personnel. His or her capability in technical sales and other public-contact positions is enhanced by his or her background in selected liberal studies.

The engineering technology graduate is qualified to select from a broad array of engineering-related positions. Job titles of engineering technology graduates include field engineer, test engineer, associate engineer, product engineer, sales engineer, tool designer, production engineer, engineering technologist, estimator, scheduler, and project engineer.

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.

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 written and oral technical communication.
- **Social sciences and humanities**-history, government, religion, literature, art, music.
- **Electives**-controlled and general.

### 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-levels-technician or technologist.

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.

### Co-op Program

The College of Engineering, Architecture and Technology offers an experience-based program, Cooperative Education (Co-op). Co-op allows 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, 101A Engineering North.

### Curricula

#### Bachelor of Science in Engineering Technology Degree Programs
- **Construction Management**
- **Electronics (computer option)**
- **Fire Protection and Safety**
- **General Manufacturing**
- **Mechanical Design**
- **Mechanical Power**

The Bachelor of Science in Engineering Technology degree requires either 128 or 129 credit hours.

### Construction Management Technology

#### Associate Professor and Head

Charles A. Rich, 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.

One of the primary goals of the Department of Construction Management is to enhance the quality of the instructional program through effective management of the curriculum, teaching assignments and fiscal and physical resources. This goal includes providing instructional facilities, equipment and support services for faculty and students which maintain an excellent learning environment.

Faculty with excellent credentials, including a balance of formal education, teaching ability and appropriate industry experience, are recruited nationwide and are provided opportunities for individual professional development and regular contact with the industry. Faculty members are encouraged to become involved in extension and research programs relating to the department's areas of strength or growth and to serve the needs for continuing education within the industry, particularly in the southwestern construction community.

These needs and opportunities for service are assessed regularly through close cooperation with local and regional construction professionals and industry associations. An active Industry Advisory Committee, representing a broad cross-section of the industry, meets regularly to offer support and guidance necessary to preserve uncompromising excellence.

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 them with a knowledge of 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 them with a knowledge of highways, soils, foundations and other course work for a career in the heavy and industrial construction industry.

The department attempts to identify and recruit highly qualified students who will benefit from the instructional program, and faculty members promote retention and ultimate graduation of construction management students through effective instruction and advisement. An active program of outcome assessment among graduates and their employers assures that the program continues to provide the academic training required for success.

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.

The bachelor's program in construction management technology is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

Electronics and Computer Technology

Professor and Head Thomas G. Bertenshaw, Ed.D.

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 diverse areas of electronics and computers.

The work of the electronics graduate may range from assisting in the design and development of new equipment in the laboratory, applying modern micro-processors in the field, to the operation or supervision of production operations, technical writing, customer service and sales.

The program provides the Bachelor of Science in Engineering Technology degree with an electronics major, and a computer option. To meet the diverse needs that graduates will have, the program provides a strong foundation of mathematics, science, and specialized courses. 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.

The program provides the Bachelor of Science in Engineering Technology degree with an electronics major, and a computer option. To meet the diverse needs that graduates will have, the program provides a strong foundation of mathematics, science, and specialized courses. 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.

The program provides the Bachelor of Science in Engineering Technology degree with an electronics major, and a computer option. To meet the diverse needs that graduates will have, the program provides a strong foundation of mathematics, science, and specialized courses. 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.

Fire Protection and Safety Technology

Assistant Professor and Interim Head James Brown, M.S., P.E.

The fire protection and safety curriculum is designed to prepare graduates to assess and reduce the loss potential existing in an operation with respect to fire, safety, industrial hygiene, and hazardous material accidents. The following are some of the applications that graduates are prepared to address. With respect to fire, reducing the loss potential might involve designing facilities with special emphasis on life safety or fire resistivity or specifying automatic detection or extinguishing systems. When considering safety, reducing accidents may require special protective equipment or clothing, and possibly the redesign of machinery or processes. Reducing losses caused by environmental problems may require sampling air for contaminants, such as asbestos or toxic chemicals, or monitoring noise levels. The redesign of ventilation systems may be needed or the development of procedures to address practical approaches to compliance with state and federal regulations.

The fire protection and safety engineering technology program has existed at Oklahoma State University since 1937. The demand by business and industry for loss control specialists has resulted in the evolution of the program into one that now also places emphasis upon industrial fire protection, safety, and occupational health in addition to fire services. The program is fully accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET) and concludes with the Bachelor of Science in Engineering Technology degree in fire protection and safety.

The curriculum is designed to immediately introduce the student to studies in fire protection and safety. Therefore, students are able to measure their interest in a fire protection and safety career early in their academic program. The curriculum is rigorous in the areas of mathematics and the physical sciences. Two semesters of calculus are required as well as two semesters of chemistry and one semester of physics. Computer usage is an essential component of most fire protection and safety courses. Interested high school students should design their high school programs to prepare themselves for college level mathematics and science classes.

The graduates of the fire protection and safety engineering technology program at Oklahoma State University are consistently recruited by the major businesses and industries of the United States. Graduate placement, salary offers, and advancement into managerial positions have been excellent due to the uniqueness and high technical quality of
the OSU fire protection and safety technology program.

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: engineering design graphics with CAD, machine tool processes, hydraulics, computer programming, electronics, controls, dynamics, supervision and instrumentation.

Manufacturing Technology
Associate Professor and Head Gerald R. McClain, M.S., CMBT

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, production planning, and manufacturing methods. Emerging career fields include robotics, computer-integrated manufacturing and automated assembly.

The manufacturing technology option provides educational experiences in the core areas of manufacturing processes, industrial materials, drafting/CAD and technical science, as well as an opportunity to develop an area of specialization. This curriculum provides the Bachelor of Science in Engineering Technology with a major in manufacturing technology.

Manufacturing courses are concentrated in the last two years allowing for efficient transfer from other OSU programs or from other colleges or universities.

The bachelor's program in manufacturing technology is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

Mechanical Design Technology
Associate Professor and Head Gerald R. McClain, M.S., CMBT

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, computer-aided manufacturing, agricultural machines, 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-aided drafting and design to sophisticated solids modeling and analysis. The mechanical design student is exposed to a range of applications from designing with 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, tool design, or manufacturing equipment design.

Mechanical Power Technology
Professor and Head Marvin D. Smith, Ph.D., P.E.

Mechanical power involves a broad spectrum of the world and its utilization is of great benefit to society. This program includes the application of vapor power cycles, gas power cycles, fluid power and power transmissions. The usage of mechanical power is related closely to the manufacturing of merchandise, diverse forms of transportation, the generation of electrical power, the exploration for and production of gas and oil, and the production of agricultural products. Since many forms of mechanical power are required for existence in the world today, graduates of this program are essential to the diverse industrial, governmental and educational institutions.

The study of mechanical power is concerned with the utilization of energy, the development and transfer of power, and the measurement and control of fluid and mechanical devices. It is a unique program which offers depth in the theoretical knowledge and a broad range in laboratory and equipment experiences. Within the major course work, the emphasis is on the solution of practical problems with supplemental laboratory experiences. It resembles a mechanical engineering program with a power option, combined with the added advantage of a strong laboratory background. The laboratory exposure enhances the theoretical portion of the program and provides extended experience with the associated hardware. This combination provides the
The bachelor's program in mechanical power technology at Oklahoma State University is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET). In addition to the required mechanical power courses, students are provided a solid foundation in algebra, trigonometry and calculus, physics, chemistry, statics, dynamics, instrumentation, thermodynamics and computer science. Students are also offered a variety of courses required by the general education portion of the curriculum, including 12 hours of written and oral communication. The curriculum is designed to allow immediate entry into the technical course work in mechanical power, thus enabling students to determine their interest and satisfaction with the discipline early in their academic careers.

Preparation for specification of industry can be accomplished by selecting courses which emphasize a given area, such as power generation, fluid power, air conditioning and heating.

Because the program focuses on the application of engineering principles to the solution of pragmatic problems, graduates are immediately employable with minimal on-the-job training, thus increasing their value to industry. Mechanical power graduates are prepared to function in the areas of product design, testing and evaluation, product application and maintenance, and technical sales and liaison. Employment includes a variety of manufacturing companies (aircraft, automobile, compressor and turbine, fluid power manufacturers), energy companies (natural gas, electrical power generation, oil and gas industries), and service companies (transportation industry, architecture and professional engineering firms, and those supporting the oil and gas industry). This partial list of employment opportunities indicates the diversity of career options for graduates of the mechanical power program. The starting salary exceeds the average for most bachelor's degree programs.
College of Human Environmental Sciences

Patricia K. Knaub, Ph.D., Dean
Margaret J. Weber, Ph.D., Associate Dean for Research and Graduate Studies
Lynn Sisler, Ed.D., Associate Dean for Undergraduate Programs
Debra C. Engle, M.S., Director for University Extension and Development

Interdisciplinary, multicultural and global in perspective, the College programs link knowledge of individual development and environmental quality. The College's graduates are prepared for people-centered professions that develop solutions to many of today's most pressing issues. These issues include promoting and contributing to human development and family functioning, improving nutrition and health, designing and managing environments that address human needs where people live, work and play, and effectively managing and delivering products and services critical to the betterment of the environment.

The College of Human Environmental Sciences (CHES) is composed of three departments-Design, Housing and Merchandising; Family Relations and Child Development; and Nutritional Sciences-and the School of Hotel and Restaurant Administration. Each science-based program focuses on the reciprocal relationship between people and their natural, constructed or social environments. Graduates pursue professional careers in business, health, communications, education, international service, research, social welfare and a variety of agencies, organizations and institutions. Preprofessional options and advisement are offered for students interested in pursuing graduate education in law, medicine, dentistry or in their major fields of study.

Accreditation

All programs culminating in a B.S. in Human Environmental Sciences are accredited by the Council for Accreditation. 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 the Didactic Program in Dietetics (DPD). The National Academy of Early Childhood Programs has accredited the Child Development Laboratory program. The School of Hotel and Restaurant Administration is accredited by the Accreditation Commission for Programs in Hospitality Administration (ACPHA). The master's level program in marriage and family therapy is accredited by the American Association of Marriage and Family Therapists (AAMFT).

Academic Advising

The CHES Office of Undergraduate Programs and Services provides advisement for all freshmen enrolling in the College and coordinates advising in the College. When a student has identified a major area of study, the student transfers to the department of his or her choice. The student is assigned a faculty adviser in that department.

Each student is advised in the planning and scheduling of his or her course work. Advising sessions include discussions on career choice and internship opportunities. The student is encouraged to maintain a close relationship with the adviser throughout the college career and to visit the adviser at times other than enrollment when only brief meetings may be possible. Students are also encouraged to participate in the Career Empowerment Opportunities (CEO) program.

Scholarships

Oklahoma State University has an extensive scholarship program for entering freshmen, and applications should be sent to the University Scholarships Office by February 1. College of Human Environmental Sciences scholarship applications are due for continuing students in January and scholarship awards are made in April. Freshmen and transfer student scholarships are awarded prior to the fall semester. Criteria for and the amount of the scholarship awards vary.

Academic Programs

Undergraduate Programs. The Bachelor of Science in Human Environmental Sciences degree is offered by three departments and one school of the College. The majors are:

Design, Housing and Merchandising, with options in apparel design, apparel merchandising and interior design.
Family Relations and Child Development, with options in early childhood education, individual, family and community services, and a preprofessional program with options in child development, youth and adult, or gerontology.
Hotel and Restaurant Administration, with options in hotel administration and restaurant management.

Nutritional Sciences, with options in human nutrition and dietetics.

A minor may be pursued in some of the College's programs.

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

Graduate Programs. The Master of Science and Doctor of Philosophy degrees are available through each department.

The Master of Science degree is offered in Design, Housing and Merchandising; Family Relations and Child Development; and, Nutritional Sciences.

Students seeking admission to a master's degree program in any of the departments must have completed 30 semester credit hours in human environmental sciences or closely-related subject matter. A student with background deficiencies must compensate for such deficiencies before completing the master's degree. Evidence of academic ability (a 3.00 GPA or above) in undergraduate work and Graduate Record Examination (GRE) scores are 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 adviser 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 through
the College in conjunction with the departments in the College of Human Environmental Sciences. Individualized programs lead to an area of specialization in any one of the departments. Admission to the program is based upon evidence that the applicant meets general requirements of the Graduate College, has demonstrated superior achievement, and can successfully complete a doctoral program, as evidenced by letters of recommendation, GRE scores, a 3.50 GPA, and a philosophy statement and goals. Applications are reviewed by a graduate faculty committee in each department. This program offers an interdisciplinary combination of courses and research experiences.

A minimum of 60 semester credit hours beyond the master's degree is required for the Ph.D. degree.

The Ph.D. degree prepares individuals to be researchers and educators for research positions in universities, business and industry, for university teaching and for administrative or management level positions.

The Doctor of Philosophy degree in food science is an interdisciplinary program available through the Department of Nutritional Sciences in cooperation with other University graduate programs.

Departmental Clubs and Honor Societies
American Society of Interior Design Student Chapter
Apparel, Merchandising, and Design Association
CHES Ambassadors
CHES Freshman Council
CHES Graduate Student Association
CHES Student Council
Club Managers Association of America
Eta Sigma Delta (hotel and restaurant administration honor society)
Family Relations and Child Development Club
High Society Catering
Hotel and Restaurant Society
International Facility Management Association Student Chapter
Kappa Omicron Nu (scholarship and leadership honor society)
Nutritional Sciences Club
Phi Upsilon Omicron (scholarship and leadership honor society)
Sigma Phi Omega (gerontology honor society)

Design, Housing and Merchandising

Professor and Head Donna Branson, Ph.D.

The mission of the Department of Design, Housing and Merchandising is to continuously improve the development and delivery of future-oriented, integrated instruction, research and extension programs in design, housing and merchandising that focus on the individual-environment interaction, that are globally oriented, scientifically based and that enhance the quality of life in a socially responsible manner. Three undergraduate options are available: interior design, apparel merchandising and apparel design.

Students in interior design are preparing for careers as professionals who assist families and businesses in planning interior spaces and solving problems relative to the function and quality of interior living and work space. Course work includes fundamental design, design analysis, space planning and programming, design of interior space, CAD and related aspects of environmental design. Career opportunities include professional practice in interior and architectural firms, historic restoration and preservation, product design and sales, and facility management. The Foundation for Interior Design Education Research (FIDER) has accredited the undergraduate interior design program.

Students in apparel merchandising are preparing for careers with major firms in the apparel and retail fields. The focus is on developing competencies associated with merchandising and management in the apparel industry. Course work includes retailing, marketing, merchandising planning and analysis, buying practices, promotion, visual merchandising, fashion and market trend analysis, and international sourcing. Career opportunities include merchandise manager, merchandise sourcing specialist, visual merchandiser, fashion coordinator, and manufacturer's representative.

Students in apparel design are preparing for careers in the apparel and textiles field. The program emphasizes the integration of design principles, fabrication, the needs and desires of the ultimate user, and mass production capabilities toward creation and production of apparel or accessory items. Course work includes principles of design, apparel production, functional apparel design, properties and performance evaluation of textiles, pattern making, CAD and entrepreneurship. Career opportunities include fashion and functional designer, accessory designer, pattern maker, pattern company or manufacturer's representative, and textile designer.

Students in all three options will develop business management, communication, creative problem solving and administrative skills. An internship is required for all undergraduate students. Minors are available in apparel merchandising and apparel design.

Graduate Programs

The Department of Design, Housing and Merchandising offers graduate work leading to the Master of Science in design, housing and merchandising and the Doctor of Philosophy in human environmental sciences degree. The programs are scientifically based and research oriented. Graduate degrees in the department are tailored to departmental areas of expertise, professional goals of the candidate and College of Human Environmental Sciences and Graduate College requirements. Graduate programs may focus on either merchandising or environmental design. Students may investigate environmental design and merchandising from the following perspectives: product development and evaluation, consumer and supplier behavior, business development and management, and constructed environmental and individual interrelationships.

The Master of Science Degree. The Master of Science degree is designed to prepare individuals for careers in business, industry, extension and post-secondary or college teaching. The program is built around the academic background, experience, needs, special interests and professional goals of the student. The selection of courses that meet departmental requirements is made in consultation with the advisory committee. If the undergraduate degree is not in
the area of specialization, specific undergraduate courses in design, housing and merchandising will be required as prerequisites. A minimum of 21 credit hours is required in the department. Additional courses may be selected from other areas of human environmental sciences or from supporting areas such as marketing, sociology, communications, and architecture. A thesis or creative component is required of all students.

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 design, housing 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 the area of specialization and in related areas, and further course work may be required before admission will be granted.

The plan of study is individually determined for 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 an area of design, housing and merchandising, including synthesis of knowledge drawn from departments within and outside of human environmental sciences. Emphasis is on attainment of competence rather than on the completion of specific numbers of credits; however, a minimum of 60 credit hours beyond the master's must be completed. Each student will develop competence in the area of specialization which includes courses in the major and the support area. A global or international dimension and a management dimension are included. The program includes a strong emphasis on research and application of statistical procedures.

More detailed information on graduate study in the Department of Design, Housing and Merchandising can be obtained by writing the head of the department.

Family Relations and Child Development

Professor and Head Rex E. Culp, Ph.D., J.D.

Courses in family relations and child development assist men and women in preparing for people-oriented and service-oriented professions, in preparing teachers, and in developing attitudes and skills that are fundamental to satisfying relationships between people and their physical, constructed, and social environments.

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 sciences, and gerontology;
2. To contribute to the available knowledge of human and family development through basic and applied research;
3. 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 development and family sciences.

The department offers undergraduate students five options: (1) child development-preprofessional, (2) early childhood education (teacher certification), (3) gerontology-preprofessional, (4) individual, family and community services, and (5) youth and adult-preprofessional. All options emphasize integration of theory and research with practice.

The child development-preprofessional option is for individuals planning to continue their education in graduate programs, medical school, law school or other specialized graduate programs. The curriculum focuses on developing skills in critical thinking, scientific investigation, and written and oral communication, in addition to gaining knowledge in child development. It prepares a student for a career as a child development specialist, pediatrician, or family law attorney. This option provides flexibility to accommodate the student's particular area of interest or to meet prerequisites for a professional school.

The early childhood education-teacher certification option provides professional preparation for individuals to teach in public school programs for pre-kindergarten through third grade. The option prepares students to design developmentally appropriate curricula for young children. An Early Childhood Education Certificate is required to teach pre-kindergarten through kindergarten in Oklahoma public schools.

The gerontology-preprofessional option provides education for individuals planning to continue their education in graduate programs, medical school, law school, or other specialized graduate programs. The curriculum focuses on developing skills in critical thinking, scientific investigation, and written and oral communication, in addition to gaining knowledge in gerontology. It prepares a student for a career as a medical field specialist with emphasis in working with the elderly and provides flexibility to accommodate the student’s particular area of interest, or to meet prerequisites for a professional school.

The individual, family and community services option prepares individuals for careers in providing services to children, youth and adults, and their families. The course content focuses on individual development and family dynamics in the context of the community. Opportunities are in social service agencies, and in business and industry.

The youth and adult-preprofessional option provides education for individuals planning to continue their education in graduate programs, medical school, law school or other specialized graduate programs. The curriculum focuses on developing skills in critical thinking, scientific investigation, and written and oral communication, in addition to gaining knowledge in youth and adult development. It prepares a student for a career as a family counselor, or marriage and family therapist, family law attorney, or medical field specialist with an emphasis in working with families. This option provides flexibility to accommodate the student’s particular area of interest or to meet prerequisites for a professional school.

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.

Graduate Programs

Graduate study in the Department of Family Relations and Child Development (FRCD) is designed to prepare students in the creation, dissemination, and application of knowledge that enhances the quality of life for individuals and families. The Department of FRCD offers a marriage and family therapy specialization that is accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy (AAMFT). The Child Development Laboratory is accredited by the National Academy of Early Childhood Programs, a division of the National Association for the Education of Young Children (NAEYC). The department has a 50-year history of providing quality graduate education in family relations and child development.

The Department of Family Relations and Child Development offers graduate study leading to the Master of Science degree and the Doctor of Philosophy. Both the Master of Science degree and
the Doctor of Philosophy degree programs develop the theoretical and research foundation for further graduate study or for the application of new knowledge. The graduate programs are tailored to the candidate’s professional goals, expertise of faculty members, Department of Family Relations and Child Development, and College of Human Environmental Sciences and Graduate College requirements. Graduate programs are central to the department’s research and generation of knowledge efforts. Faculty and students share an obligation to make significant contributions to the store of knowledge and share this knowledge with various audiences.

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 but should have 12 upper-division semester credit hours in child or human development, family sciences or closely-related areas. Students not meeting these criteria may be required to complete prerequisite undergraduate courses in order to be fully admitted to the graduate program. A minimum of 18 credit hours of core departmental course work is required. Depending upon the program area, additional courses are required in each specialization area as described below. Students are admitted into one of the following specializations for the Master of Science degree: (1) child development, (2) family science, and (3) marriage and family therapy.

Beyond the departmental core courses, students within each specialization take course work determined in consultation with their advisers and advisory committees. The child development and family science specializations require a total of 30 semester hours for the thesis option and 36 semester hours, including a written creative component, for the non-thesis option. The marriage and family therapy curriculum is designed to meet the COAMFTE accreditation guidelines and requires 51-60 semester hours.

The child development specialization includes courses in child development to provide the background for working with young children and parents. This specialization emphasizes a balance of academic knowledge for current research and theory and opportunities for experience in the child development laboratory or classroom environment. This specialization is designed for individuals who desire further education in child development and is the natural extension of an early childhood education degree. It provides the background for working with young children in a variety of settings. Students in this specialization gain a core theoretical and research base and could choose to build a program which leads to partial fulfillment of requirements for state certification in early childhood programs, parent education, child development specialist, and curriculum specialist.

The family science specialization is designed for students who desire to work with families in family life education, or in family and community service settings, or to pursue doctoral studies in family science. The curriculum provides the research and theoretical foundations and opportunities to develop the professional skills necessary to work in a variety of family-oriented careers or to pursue further graduate studies. Career opportunities include administrator of family and community services agencies, family life educator, family consultant, and parent educator.

The marriage and family therapy specialization provides students with basic knowledge, skills and a professional identity essential for entry-level practice of marital and family therapy. This program has restrictive admission requirements and is accredited by the Commission on Accreditation for Marriage and Family Therapy Education of the American Association for Marriage and Family Therapy (AAMFT). The curriculum includes course work in individual development, marital and family systems, marital and family therapy, professionalism and ethics, research and statistics and supervised practicum. Graduates practice in controlled settings and under supervision, with methods for determining how couple and family problems develop and can be resolved.

Students completing an M.S. in family relations and child development may work toward the Graduate Certificate in gerontology at Oklahoma State University by designing a plan of study that meets the requirements for one of the FRCD specializations and the OSU Graduate Certificate in gerontology requirements. Oklahoma State University is an institutional member of the Association for Gerontology in Higher Education.

The Doctor of Philosophy Degree. The Doctor of Philosophy degree is awarded in human environmental sciences with specialization in family relations and child development. The objective of the program is to offer an integrated interdisciplinary combination of courses and research with a specialized focus on family relations or child development. The program is designed to prepare competent researchers and educators who will make contributions to the scientific literature in child development and family sciences. Throughout the program, students work toward establishing competencies in: (1) an area of specialization within family relations and child development; (2) the design and implementation of research, including computer analysis and contributions to theory development; (3) the ability to function as a member of an interdisciplinary team and to synthesize knowledge from a variety of academic specialties, and, (4) the performance of professional leadership roles within a specific area of specialization.

Admission to the Ph.D. program is selective and requires the completion of an M.S. in family relations, child development or a related area. Admission decisions are based on a variety of criteria including grade-point average (3.00 grade-point average in undergraduate work and 3.50 in previous graduate study preferred; 3.25 in previous graduate study is required), GRE scores (450 or higher in each of the Verbal, Quantitative and Analytical sections preferred), letters of recommendation, student goals, and TOEFL scores (required for students for whom English is a second language, 575 minimum).

Students work with their advisers and advisory committees to develop flexible, yet rigorous programs that meet both degree requirements and the professional needs of specialization within family relations and child development. The program requires 60 hours beyond the master’s degree including 18-30 hours in FRCD and supporting areas, 18-30 hours in research methods and statistics, a three hour course in human environmental sciences, and 15 hours of dissertation. Students who did not complete a thesis for the master’s degree are required to complete a thesis equivalent project in addition to the minimum 60 credit hours beyond the master’s degree.
Nutritional Sciences

Professor and Interim Head Barbara J. Stoecker, Ph.D.

The Department of Nutritional Sciences prepares graduates for positions in nutrition and dietetics. This diverse and dynamic profession 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 Didactic Program in Dietetics (DPD) 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 a minimum of 126 semester credit hours.

When students successfully complete the academic requirements (DPD) 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 by the American Dietetic Association. The individual who is successful on the examination is a registered dietitian and entitled to use the initials "RD." to signify professional competence.

Many states including Oklahoma recognize this certification after entry into the program. An advisory committee gives final approval of the plan.

Students may also apply to the master's internationalist program which combines international experience and language training through the Peace Corps with academic study for an M.S. in nutrition. These students begin their academic study in the summer session to prepare them for their Peace Corps assignments one year later.

The Doctor of Philosophy Degree. The Ph.D. degree is awarded in human environmental sciences with specialization in nutritional sciences. To be admitted, applicants will be expected to provide evidence of academic ability and preparation, and a statement of goals and letters of recommendation. An emphasis in human nutrition or in food systems administration and management is available depending on the student's interests and qualifications. The department also participates in OSU's interdisciplinary food science program. To acquire the competencies required, the candidate will need to study in their areas of emphasis and in selected areas within and outside the department.

More detailed information on graduate study in the Department of Nutritional Sciences can be obtained by writing the head of the department.

School of Hotel and Restaurant Administration

Professor and Director Raphael R. Kavanaugh, Ed.D., CHA

The School of Hotel and Restaurant Administration is accredited by the Accreditation Commission for Programs in Hospitality Administration (ACPHA), a specialized accrediting body. The mission of the OSU School of Hotel and Restaurant Administration (HRAD) is to provide education, research, and service in a globally sensitive, scientifically-based advanced level program for hospitality management careers and life-long learning based on ethical principles. This mission is accomplished by implementing instructional and operational components in the curriculum identified by industry leaders as requirements for success. The academic program is delivered with balanced emphasis on scientific principles and practical business applications. The school has a reputation for providing qualified and skillful managers in lodging, restaurants, clubs and institutional food service settings. An educational facility of more than 22,500 square feet houses laboratories, classrooms, exhibit areas and faculty offices. Specific accommodations include: hotel lobby with front desk and reservation system, quantity food preparation areas with state-of-the-art commercial equipment and diverse methods of meal preparation; dining room management and table service laboratory; two fast-food service laboratories for multi-unit fast-food operations; laboratory for computer management information systems; basic food preparation laboratory; classroom and demonstration area; and project room.

Career opportunities include tourism, food service operations, personnel administration, labor relations, sales and promotion, accounting, front office and general management positions. Positions as regional directors for lodging, restaurant, industrial, and fast food management chains are additional possibilities. Airline catering, vending and individual restaurant entrepreneurship are excellent career areas.

To meet the needs of the industry and provide sound academic preparation at the undergraduate level, the curriculum emphasizes professional and general education. The professional area includes courses in accounting, law, finance, communications, economics, marketing and personnel management.
Courses in service management, food and beverage purchasing and control, layout and design, interior design, sales and promotion, front office management, tourism, and advanced hotel and restaurant management are also included in the specialized area. General requirements are met through courses in English, the natural and social sciences, humanities, political science, history and government, mathematics and computer application. The B.S. degree with a major in hotel and restaurant administration may be earned by completing a minimum of 128 semester hours and maintaining a 2.50 grade-point average for courses required in the major area.

Successful completion of a management internship is required. Internship placement in hotels, restaurants, and related establishments is arranged globally in cooperation with industry executives and the OSU faculty.

A well-balanced academic high school program is recommended for students interested in hotel or restaurant management as a career. Mathematics, accounting, computer science, English and speech are excellent background courses.

Graduate Programs

The Master of Science Degree. Admission to the graduate program in hospitality administration is selective and based on a variety of factors including grade-point average, Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) scores, letters of recommendation and student goals. Students are required to have a bachelor's in hospitality administration or allied field and a minimum of two years of relevant work experience. Prerequisite courses may be required for students with other degrees. The master's degree requires a minimum of 30 semester hours, including six credit hours in HRAD core courses, six credit hours in HRAD specialization courses and six credit hours in guided electives. A six credit hour research thesis is also required.

The plan of study is individually developed with an adviser who is designated after entry into the program. An advisory committee gives final approval of the plan.
College of Osteopathic Medicine

Thomas Wesley Allen, D.O., Provost and Dean
David T. John, Ph.D., Associate Dean of Basic Sciences
Larry D. Cherry, D.O., Associate Dean for Clinical Education
Daniel E. Overack, Ph.D., Assistant Dean of Students Admission and Advisement
Wennette W. Pegues, Ed.D., Assistant Dean of Students Registrar and Financial Aid
Gary H. Watson, Ph.D., Director of Research

As health care grows more complicated, primary care physicians will be needed more than ever. The College of Osteopathic Medicine is helping to fulfill a critical need by training physicians who are able to treat every member of the family and can simplify the health care process by applying his or her knowledge to treat the whole person.

Most graduates of OSU-COM practice in the primary care fields-family medicine, pediatrics, internal medicine and obstetrics/gynecology. Others continue their training in specialties and subspecialties-anesthesiology, neurology, psychiatry, radiology, surgery, emergency medicine, dermatology, and oncology, to name a few. Regardless of the field they pursue, students are trained to be excellent physicians, starting with a strong background in general medicine.

The College was founded in 1972 in response to a physician shortage in the small towns and rural areas in the state. The College opened its doors in 1974 and graduated its first class in 1977. In 1998, the College was merged with Oklahoma State University and continues to prepare students to be primary care physicians with emphasis in rural medicine. Nationwide, the greatest need is for doctors to care for people in small towns.

The main campus is located on 16 acres along the west bank of the Arkansas River with a full view of downtown Tulsa and includes a modern three-building complex. The Center for Advanced Medical Education is expected to be completed in 1996 and will house an expanded library, Telemedicine Center, and extensive conference facilities. On the south campus, a half-mile away, is an office building and medical bookstore, and the Health Care Center. First opened in 1981, this clinical teaching facility can accommodate up to 3,000 patient visits a month. It is both a teaching clinic for medical students, interns, and residents, and a health care resource for residents of the west Tulsa area. The Health Care Center provides comprehensive health care and is staffed by licensed physicians and other health care professionals who supervise students in the care of patients.

Osteopathic Medicine

Promoting a patient-centered approach to health care, osteopathic physicians are concerned with the entire patient and traditionally have excelled in general and family health care. The doctor of osteopathic medicine is a fully-trained physician who selectively utilizes all accepted scientific modalities to maintain and restore health. They are licensed to practice all phases of medicine, and offer their patients an added dimension of health care through osteopathic manipulation, a hands-on technique that uses palpation and manipulative procedures of the musculoskeletal system to diagnose illness and treat patients.

Minimum Admission Requirements

At the time of application, the applicant must have completed:

1. At least 90 semester hours and not less than 75 percent of the courses required for the baccalaureate degree at a regionally-accredited college or university;
2. Satisfactory completion of the following courses, including laboratory, with no grade below a "C" (2.00 on a 4.00 scale):
   - English (six to eight semester hours)
   - Biology (eight to 10 semester hours)
   - General chemistry (eight to 10 semester hours)
   - Organic chemistry (eight to 10 semester hours)
3. Applicants must have taken at least one of the following undergraduate courses: biochemistry, comparative anatomy or cellular biology, embryology, microbiology or molecular biology, histology, physiology, genetics.

An on-campus interview with the Applicant Interview Committee is by invitation only. Interviews are conducted by clinical and basic science faculty members. Applicants must participate in the interview to qualify for further consideration. Interview results and other data submitted will be considered when determining which applicants have demonstrated appropriate levels of scholarship, aptitude, and motivation for admission to the program. Class size is limited to 88 students. Non-U.S. citizens must have a permanent resident visa ("green card") at the time of application in order to be considered for admission. The annual application deadline is January 1.

College Curriculum

Divided into Basic Sciences and Clinical Sciences, the curriculum at the College emphasizes primary care. 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 a foundation 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 year of study emphasizes 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 two years 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 medicine. Other clinical training occurs at a small rural hospital, primary care clinic, psychiatric facility, community health facility, and offices of private physicians.

Students graduate from the four-year program with the Doctor of Osteopathic Medicine (D.O.) degree. Following graduation, students complete a one-year rotating internship and then enter a residency program.

Detailed information on the College of Osteopathic Medicine can be found in the College's academic catalog, available from the College:

Oklahoma State University College of Osteopathic Medicine
1111 West 17th Street, Tulsa, Oklahoma 74107-1898
(918) 582-1972
Toll-free, 1-800-677-1972

Graduate Medical Education

The College administers internship and residency programs at Tulsa Regional Medical Center, Hillcrest Health Center in Oklahoma City and Jefferson Regional Medical Center in Pine Bluff, Arkansas. In addition, the College administers a two-year family practice residency program in Tulsa.

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.

Selection Factors

The College considers applications for admission from all qualified candidates without regard to age, sex, creed, race, disability or national origin. Preference is given to Oklahoma residents. 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 Bureau of Professional Education of the American Osteopathic Association, the recognized accrediting agency for institutions that educate osteopathic physicians. The Oklahoma State Regents for Higher Education are empowered by the Oklahoma Constitution to prescribe standards for higher education applicable to each institution in the Oklahoma State System of Higher Education.

Financial Aid

A financial aid officer works to ensure that students are not prevented from attending the College because of their financial situations. The primary purpose of the College's aid program is to provide financial assistance to students who would otherwise be unable to afford tuition. A computer search program allows students to systematically find available loans, grants and scholarships for which they may be eligible.

Tuition at the College of Osteopathic Medicine (for the 1994-95 school year) totals $6,566.50 per year for Oklahoma residents and $16,226.50 per year for out-of-state residents.

Although the principal responsibility for financing an education remains with the student and his or her family, the College will work to offer campus-based aid to supplement that contribution.

Because the number of applicants and their total requests each year exceed the resources available, a selection process is necessary to see that the most deserving and best qualified students have first claim on available resources. Financial aid options include loans, scholarships, and grants, as well as work-study programs and return service agreements.

A Family Financial Statement and other required applications are available from the College.

Honor and Service Organizations

The College emphasizes community service, and many students volunteer their time in giving school and athletic physicals, visiting nursing homes, working with school children, and working at College-sponsored health fairs or the annual Osteopathic Run. Listed below are official student organizations.

American College of Family Practitioners-Undergraduate Chapter
American Medical Women's Association
Association of Military Osteopathic Physicians and Surgeons
Atlas Fraternity (social)
Christian Medical and Dental Society
Delta Omega (national osteopathic sorority)
Geriatric Medicine Club
Inter-Club Council
Osteopathic Sports Medicine Society
Pinnacle Yearbook
Sigma Sigma Phi (honor society)
Society for the Advancement of Osteopathic Medicine
Student Associate Auxiliary
Student National Medical Association
Student Osteopathic Internal Medicine Association
Student Osteopathic Medical Association
Student Osteopathic Surgical Association
Student Senate
Undergraduate American Academy of Osteopathy
College of Veterinary Medicine

Joseph W. Alexander, D.V.M., M.S.,
Dean
Billy E. Hooper, D.V.M., Ph.D.,
Associate Dean for Academic Affairs
Thomas R. Thedford, D.V.M.,
Assistant Dean for Outreach
James E. Creed, D.V.M., M.S.,
Assistant Dean for Service and Director of the Boren Veterinary Medical Teaching Hospital

The primary objective of the College of Veterinary Medicine is to educate veterinarians for private practice. However, the professional curriculum provides an excellent basic medical education in addition to training in diagnosis, disease prevention, medical treatment, and surgery. Graduates are qualified to pursue careers in many facets of veterinary medicine and health-related professions.

Accreditation

The College has full academic accreditation status approved by the Council on Education of the American Veterinary Medical Association. Accreditation is based on an assessment of 10 essential factors, namely, the college’s organization, its finances, physical facilities and equipment, clinical resources, library and learning resources, enrollment, admissions, faculty, curriculum, and continuing and post-graduate education.

Preparatory Requirements

Attainment of the degree of Doctor of Veterinary Medicine requires, at a minimum, six academic years of collegiate training. In preparation for the professional training the student must complete both prescribed and elective collegiate courses. The minimum prescribed preparatory studies, totaling 60 semester hours of course work, can be completed in two calendar years. Most of the entering veterinary medical students in recent years have had three to four years of preparatory training or a bachelor’s degree. It is recommended that the student undertake an appropriate regular bachelor’s degree program in the sciences, in the course of which he or she will complete the prerequisites for entry into the College of Veterinary Medicine by the end of at least the third year of preparatory training.

Admission Requirements

Collegiate course requirements for entry into veterinary medical college may be completed at any accredited university or college. Special pre-veterinary curricula are available at Oklahoma State University through the College of Agricultural Sciences and Natural Resources and the College of Arts and Sciences. Both colleges offer programs of study in pre-veterinary medical sciences which provide for the award of a bachelor’s degree after the first or second year of veterinary medical studies to those persons who gain early entry into a veterinary medical college.

Requests for information on pre-veterinary medical study programs and applications for admission to such programs should be addressed to the dean of either the College of Agricultural Sciences and Natural Resources 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. An English elective may be substituted for the technical writing.

Chemistry-17 semester credit hours including five semester credit hours of organic chemistry designed for pre-veterinary, premedical and pre-dental students which must include both the aliphatic and aromatic series of organic compounds. Additionally three semester credit hours of biochemistry 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.

Biological science-15 semester credit hours. Courses in zoology, 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 disadvantaged and minority 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 1, 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, a limited number 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 of 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
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, with the fourth starting shortly after the third. The fourth year is clinical in nature and classes are primarily in the Boren Veterinary Teaching Hospital. The fourth year is organized into two-week rotations to provide for lower faculty-student ratio and more efficient use of clinical facilities and resources.

**Departmental Clubs and Honor Societies**

- American Veterinary Medical Association, Student Chapter
- Society of Phi Zeta Nu Chapter
  (academics and research)

**Physiological Sciences**

**Regents Professor and Head**
Charlotte L. Ownby, Ph.D.

**Graduate Programs**

The Department of Physiological Sciences offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy. 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 morphology, pharmacology, physiology and toxicology.

**Application Procedure.** Applications are accepted at any time; however, to be considered for assistantships, applications for enrollment in the spring semester should be received by February 15, and applications for

**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 re

**Criteria for recommending admission are:**

1. For candidates whose highest earned degree is the baccalaureate, the sum of verbal and quantitative scores on the Graduate Record Examination will be multiplied by the grade-point average on a four point scale, for the last 60 hours of undergraduate course work. The product score must be 3000 or greater for M.S. degree candidates or 3150 or greater for Ph.D. degree candidates for admission without qualification. Students who fail to meet these criteria may be considered for admission on a provisional basis.

2. For candidates with advanced degrees, medical degrees or degrees earned outside the United States, admission status will be evaluated on an individual basis.

Applicants are encouraged to select a major professor prior to admission to the departmental program. When this is not possible, two temporary advisers will be assigned by the Graduate Education Committee. A permanent adviser should be chosen as soon as possible. When the student's graduate adviser is determined, the department head, in consultation with the adviser and the Graduate Education Committee, will appoint a graduate advisory committee. Two of the committee members must be members of the graduate faculty of the Department of Physiological Sciences. This committee will consist of not fewer than three graduate faculty members for students pursuing the master's degree. For students pursuing the doctoral degree, a graduate advisory committee of not less than four graduate faculty members, one of whom must be from outside the departmental graduate faculty, will be appointed by the dean of the Graduate College upon recommendation of the Graduate Education Committee. Functions of the advisory committee are described in the "Graduate College" section.

**The 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 determinated by the graduate advisory committee in conference with the student but must include four credits of seminar and PHSI 5224. The 90 semester credit hours may include all or a part of the work completed for a master's degree. The student must pass written and oral qualifying examinations. A 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 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 sciences course work.

**Veterinary Medicine and Surgery**

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

**Internship and Residency 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. Internships are designed in part to prepare
for residencies or graduate academic programs. Residencies are two-or 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. Most open positions are listed in the Veterinary Internship/Residency Matching Program directory published each October.

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 helminthology, protozoology, bacteriology, virology, immunology, epidemiology and public health. The program is designed to prepare individuals for careers in teaching and research, and is flexible to meet the needs of the student within the capabilities of the department and the University.

Application Procedure. Applications are accepted at any time; however, all documents must be received prior to March 1 for admission to the summer session, July 1 for the fall semester, and November 1 for the spring semester. Applicants are required to submit scores for the Aptitude Test portion of the Graduate Record Examination. (The Advanced Test in Biology is also suggested.) International applicants are required to take the English Proficiency Exam (TOEFL: a passing score is 550 or above), as well as the Test of Spoken English (TSE: a passing score is 220 or above), before they can be considered for graduate teaching assistantships unless they are from a country where English is a first language.

Applicants generally select a major professor before they are admitted to the departmental program. They are urged to correspond with a member of the department’s graduate faculty whose interests reflect their own before making application. Information about the faculty’s research interests is available upon written request to the department. After acceptance to the graduate program, the department head recommends an advisory committee to the dean of the Graduate College to develop a plan of study.

Prerequisites. Candidates for admission must possess a bachelor's degree or equivalent, including 30 semester credit hours in biological and physical sciences. Unqualified admission will be granted only to those applicants with combined verbal and quantitative GRE total scores multiplied by their GPAs (last 60 hours) totaling 3000 or greater. Provisionary status may be awarded to those not having these credentials with specific requirements dependent on recommendations of the departmental graduate faculty.

The Master of Science Degree. The M.S. must be earned by either Plan I, with thesis, 30 credit hours, including not more than six credit hours for the thesis, or Plan II, with report, 32 credit hours, including not more than two credit hours for the report. The plan of study will be tailored to meet the student's needs and interests; however, all students must enroll in the course Current Topics in Veterinary and Biomedical Science (VPARA 5120) and in Seminar (VPARA 6110) for one credit hour each, and must pass three credit hours of biochemistry acceptable for graduate credit, and a course in statistical methods. The student must also pass a final oral examination covering the thesis or report and related course work.

The Doctor of Philosophy Degree. The Ph.D. requires a total of 90 credit hours beyond the B.S. degree. All Ph.D. students must enroll in the course Current Topics in Veterinary and Biomedical Science (VPARA 5120) for one hour of graduate credit and 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 and Residency Programs

The Department of Veterinary Pathology offers graduate programs with options of basic research in pathobiology or veterinary pathology. Pathobiology is available to persons with a minimum of a bachelor's degree in a science-related field and is designed to prepare individuals for careers in teaching and research. The research program in the Department of Veterinary Pathology is focused on elucidation of mechanisms of disease, utilizing the disciplines of microbiology, immunology, toxicology, histology, immunocytochemistry, electron microscopy and molecular biology. Persons who undertake a program in the area of veterinary pathology must have a professional degree in veterinary medicine. It is designed to prepare individuals for careers in teaching, research and service pathology as required to fulfill the requirements of academics, animal diagnostic facilities, and industries.

The Master of Science Degree. The M.S. may be earned by 30 credit hours beyond a bachelor's degree including not more than six credit hours for the thesis. The plan of study will be designed to meet the student's needs and interests. Requirements include one credit of seminar, one course in biochemistry and one course in statistics. The student must also pass a final oral examination covering the thesis and related course work.

The Doctor of Philosophy Degree. The Ph.D. degree requires a total of 90 credits beyond the bachelor's degree. The plan of study will be designed to meet the student's needs and interests. Requirements include courses in biochemistry, biochemistry techniques, statistics and two credits of seminar. 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.

Application Procedure. Applications are accepted at any time. Applicants should submit college transcripts and Graduate Record Examination scores.
Faculty

College of Agricultural Sciences and Natural Resources

Agricultural Communications
Professor and Head
James G. Leising, Ph.D.

Professor
Kevin G. Hayes, M.A.

Associate Professor
Robert F. Reisbeck, Ed.D.

Instructor
Shelly R. Sitton, M.S.

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

Regents Professor and Pat and Jean Neustadt Chair in Agricultural Economics
Harry P. Mapp, Ph.D.

Regents Professors
Gerald A. Doeksen, Ph.D.; James N. Trapp, Ph.D.

Professors

Associate Professors

Assistant Professors
Brian Adam, Ph.D.; Phil Kinkel, Ph.D.; Stephen R. Koontz, Ph.D.; Noile H. Lansford, Ph.D.; Patricia Norris, Ph.D.; Derrell S. Peel, Ph.D.

Agricultural Education
Professor and Head
James G. Leising, Ph.D.

Professors

Associate Professors
James Mosley, Ed.D.; William G. Weeks, Ph.D.

Assistant Professors
Billie Chambers, Ed.D.; Sheila Forbes, Ph.D.

Instructor
Charles Cox, Ed.D.

Agriculture (General)
Professor and Assistant Dean
C. Wesley Holley, Ed.D.

Agronomy
Professor and Head
Robert L. Westerman, Ph.D.

Regents Professor and Warth Distinguished Professor of Agronomy
Charles M. Taliaferro, Ph.D.

Regents Professor and Wheat Genetics Chair in Agriculture
Edward L. Smith, Ph.D.

P.E. Harrill Distinguished Professor of Crop Science
Donald S. Murray, Ph.D.

Professors

Associate Professors
J.C. Banks, Ph.D.; Terence G. Bidwell, Ph.D.; Arron C. Guenzl, Ph.D.; David R. Porter, Ph.D.

Assistant Professors

Animal Science
Professor and Head
Donald G. Wagner, Ph.D.

Professor and President Emeritus
John R. Campbell, Ph.D.

Professor, Dean and Director, College of Agricultural Sciences and Natural Resources
Charles B. Browning, Ph.D.

Regents Professors
Don R. Gill, Ph.D.; Stanley E. Gilliland, Ph.D.; William G. Luce, Ph.D.; Fredric N. Owens, Ph.D.; Robert P. Wettmann, Ph.D.

Professors

Associate Professors
Archie C. Clutter, Ph.D.; W. Stephen Damron, Ph.D.; H. Glen Dolezal, Ph.D.; Gerald D. Fitch, Ph.D.; Glenn E. Seik, Ph.D.; Leon J. Spilka, Ph.D.

Assistant Professors
Mark Z. Johnson, Ph.D.; Sally Northcutt, Ph.D.; Daniel Pomp, Ph.D.

Biochemistry and Molecular Biology
Professor and Head
James B. Blair, Ph.D.

Regents Professors
Margaret K. Eisenberg, Ph.D.; Chang-An Yu, Ph.D.

Professors
Richard C. Eisenberg, Ph.D.; Franklin R. Leach, Ph.D.; Ulrich K. Melcher, Ph.D.; Earl D. Mitchell, Ph.D.; Andrew J. Mort, Ph.D.; H. Olin Spivey, Ph.D.; Linda Yu, Ph.D.

Associate Professor
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Obstetrics and Gynecology
Professor and Chairman
Joseph A. Keuchel, D.O.
Clinical Professor
Richard R. Polk, D.O.

College of Veterinary Medicine

Physiological Sciences
Regents Professor and Head
Charlotte L. Ownby, Ph.D.
Professors
James E. Breazile, D.V.M., Ph.D.; George E. Burrows, D.V.M., Ph.D.; Subbiah Sangiah, B.V.S., Ph.D.

Osteopathic Family Medicine
Assistant Professor and Chairman
JoAnn G. Ryan, D.O.
Professors
Larry D. Cherry, D.O.; Tom E. Denton, D.O.
Clinical Professor
Herbert A. Yates, D.O.
Associate Professors
Clinical Associate Professors
Assistant Professors
Diana L. DeFelice, D.O.; Jack R. Lamberson, D.O.
Clinical Assistant Professors

Pathology
Associate Professor and Chairman
Edward F. Goljan, M.D.
Professor
Dianne Miller-Hardy, Ph.D.
Clinical Assistant Professor
Steve E. Rose, D.O.

Pediatrics
Professor and Chairman
William R. Kennedy, D.O.

Psychiatry and Behavioral Sciences
Associate Professor and Chairman
Susan K. Redwood, Ph.D.
Professors
J. C. Doggett, Ph.D.; Michael H. Pollak, Ph.D.
Associate Professors
Richard H. Bost, Ph.D.; Vivian M. Stevens, Ph.D.
Assistant Professors
Wennette W. Pegues, Ed.D. (adjunct); Nancy Van Winkle, Ph.D.

Radiology
Clinical Professor and Chairman
Dean R. Fullingim, D.O.

Surgery
Professor
William E. Moore, D.O.
Clinical Associate Professor
Thad Taylor, D.D.S.
Clinical Assistant Professors
Ronnie L. Keith, D.O.; David R. Rittenhouse, D.O.; Adam B. Smith, D.O.; Brett A. Wyrick, D.O.
Associate Professors

Teaching Associates
Joseph Roder, D.V.M.; Virginia Schultz, D.V.M.

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

Professors

Associate Professors

Assistant Professors

Administrative and Professional
John G. Kirkpatrick, D.V.M.; Katrina R. Meinikoth, D.V.M.; Petrina A. York, D.V.M.

Adjunct Faculty
Burke L. Healey, D.V.M.; William G. Huber, D.V.M.; Lloyd M. Reedy, D.V.M.

Residents

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

Regents Service Professor
Patrick M. Morgan, D.V.M., Dr. P.H.

Professors

Associate Professors
Jean M. d’Offay, D.V.T.V.M., Ph.D.; Richard W. Eberle, Ph.D.; John H. Wyckoff III, Ph.D.

Assistant Professors

Teaching Associate
Jean M. Clarke, D.V.M.

Veterinary Pathology
Professor and Head
Anthony W. Confer, D.V.M., Ph.D.

Professors

Associate Professors
Kenneth Clinkenbeard, D.V.M., Ph.D.; Ray Ely, D.V.M., Ph.D. (adjunct); George L. Murphy, Ph.D.; Stanley L. Vanhooser, D.V.M., M.S.

Assistant Professors

Assistant Researcher
Edmour Blouin, Ph.D.

Residents
Sundeep Chandra, B.V.Sc.; Christine Garhart, D.V.M.; Nick Gatto, D.V.M.; Amy Thiessen, D.V.M.

Oklahoma Animal Disease Diagnostic Laboratory
Professor and Director
William C. Edwards, D.V.M., M.S. (toxicologist)

Professors
E. L. Stair, D.V.M., Ph.D. (chief pathologist); Delbert L. Whiteneck, D.V.M., Ph.D. (pathologist)

Associate Professors
Ray W. Ely, D.V.M., Ph.D. (pathologist); Stanley L. Vanhooser, D.V.M., M.S. (pathologist); Ronald D. Welsh, D.V.M., M.S. (bacteriologist)

Assistant Professor
Jeremiah T. Saliki, D.V.M., Ph.D. (virologist)

Resident
Eric Stair, D.V.M. (virologist)

Board Certification in Specialty Area

146 Faculty
Graduate College

Graduate College Calendar

(Refer also to the 'University Calendar')

First Semester 1995-96, Fall
August 21, Monday
Class work begins
September 1, Friday
Last day to file a diploma application
September 22, Friday
Applications for graduate credit for graduating seniors due
November 3, Friday
FINAL DRAFT copy of dissertations, theses and reports due
November 3, Friday
Application for admission to spring candidacy due for doctoral and Ed.S. candidates
November 17, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
December 1, Friday
FINAL COPIES of dissertations, theses and reports due by fall candidates
December 10, Sunday
Graduate College Hooding Convocation
December 15, Friday
Class work ends

Second Semester 1995-96, Spring
January 8, Monday
Class work begins
January 19, Friday
Last day to file a diploma application
February 9, Friday
Applications for graduate credit for graduating seniors due
March 22, Friday
FINAL DRAFT copy of dissertations, theses and reports due
April 5, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
April 9, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates
April 19, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates
May 3, Friday
Class work ends

May 3, Friday
Graduate College Hooding Convocation
May 4, Saturday
University Commencement

Summer 1996
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 26, Friday
Class work ends

First Semester 1996-97, Fall
August 19, Monday
Class work begins
August 30, Friday
Last day to file a diploma application
September 20, Friday
Applications for graduate credit for graduating seniors due
November 1, Friday
FINAL DRAFT copy of dissertations, theses and reports due
November 1, Friday
Application for admission to spring candidacy due for doctoral and Ed.S. candidates
November 15, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
November 29, Friday
FINAL COPIES of dissertations, theses and reports due by summer candidates
December 8, Sunday
Graduate College Hooding Convocation
December 13, Friday
Class work ends

Second Semester 1996-97, Spring
January 13, Monday
Class work begins
January 24, Friday
Last day to file a diploma application
February 14, Friday
Applications for graduate credit for graduating seniors due
March 28, Friday
FINAL DRAFT copy of dissertations, theses and reports due
April 11, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
April 25, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates
April 25, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates
May 9, Friday
Class work ends
May 9, Friday
Graduate College Hooding Convocation
May 10, Saturday
University Commencement

Summer 1997
Regular 8-Week Summer Session
June 9, Monday
Class work begins
June 13, Friday
Last day to file a diploma application
June 13, Friday
FINAL DRAFT copy of dissertations, theses and reports due
June 13, Friday
Applications for graduate credit for graduating seniors due
June 13, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
July 11, Friday
FINAL COPIES of dissertations, theses and reports due by summer candidates
August 1, Friday
Graduate College Hooding Convocation
August 1, Friday
Class work ends
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.

For additional information, the Graduate College may be reached at:
Phone: 1-405-744-6368 or 1-800-227-GRAD
FAX: 405-744-6244
E-Mail: GRAD-i@okway.okstate.edu

Organization of the Graduate College
The Graduate College administers regulations and standards specified and established by the Graduate Faculty. The Graduate Faculty Council is elected by the Graduate Faculty to work with the dean of the Graduate College in development and administration of policy. The Graduate Faculty 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 Council or the general Graduate Faculty for approval.

Graduate Council Members
Thomas C. Collins, Chair
Charlotte Ownby, Vice-Chair

Group 1--Biological Sciences
1995--Charles Taliaferro
1997--James Motes
1995--Robert Hunger

Group II--Humanities
1996--Carol Moder
1998--Jeffrey McQuillen
1996--Linda Leavell

Group III--Physical Sciences and Technology
1995--K.M. George
1997--Richard Essenberg
1995--Eric Price

Group IV--Social Sciences
1996--David Fournier
1998--Don R. Hansen
1996--Daryl Nord

Group V--Teacher Education
1995--Garry Rice
1997--James P. Key
1995--Margaret Scott

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 Center for International Trade Development, 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.

All departmental requests for permission to offer advanced degrees are referred to the Graduate Faculty Council and then to the Graduate Faculty with the Graduate Council’s recommendations.

All requests for waiver of any rules or regulations as listed in the Catalog must be in the form of petitions to the dean of the Graduate College. A supporting letter from the major adviser is also required.

The University Center for Water Research (UCWR) coordinates programs associated with the Oklahoma Water Resources Research Institute, the Water Resources 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 vice-president for research and 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.

Accreditation
Oklahoma State University is accredited by the North Central Association of Colleges and Secondary Schools. Programs within the colleges are also accredited by other agencies.

In the College of Agricultural Sciences and Natural Resources, 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 Science; the chemistry program is accredited by the American Chemical Society; the Ph.D. program in history is accredited by the American Historical Association; the School of Journalism and Broadcast- ing 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, programs in the School of Health, Physical Education, and Leisure are accredited by the National Recreation and Park Association as well as the American Association for Health, Physical Education, and Recreation; 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 aerospace engineering, architectural engineering, biosystems engineering, chemical engineering, civil engineering, electrical engineering, general engineering, industrial engineering and management, and mechanical engineering. The Technology Accreditation Commission of the Accreditation Board for Engineering and Technology has accredited the bachelor's programs in construction management technology, electronics technology, fire protection and safety technology, manufacturing technology, mechanical design technology and mechanical power technology. The National Architecture Accrediting Board has accredited the bachelor's program in architecture.

Professional programs in the College of Human Environmental Sciences are recognized by separate prestigious accreditations and approvals. The Foundation of Interior Design Education Research has accredited the interior design program. The National Academy of Early Childhood Programs has accredited the Child Development Laboratory that serves as a model teaching laboratory for students in early childhood education. The Oklahoma State Department of Education and the Oklahoma State Department of Vocational-Technical Education has accredited the programs in family relations and child development. The American Association of Marriage and Family Therapists has accredited the master's program in marriage and family therapy. The American Dietetic Association has approved the Preprofessional Practice Program (AP4) and the Didactic Program in Dietsetics (DPD). The Council on Professional Development, American Home Economics Association has fully accredited the baccalaureate program.

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.

Programs at OSU's branch campuses have also received accreditation from national agencies. The College of Osteopathic Medicine-OSU is accredited by the American Osteopathic Association. The nursing program at OSU-Oklahoma City is accredited by the National League for Nursing and approved by the Oklahoma Board of Nurse Registration and Nursing Education.

Refer to the appropriate college sections in the Catalog for further information on accreditation of specific programs.

Services at OSU

Library

The Oklahoma State University Edmon Low Library contains more than 5.2 million books, documents, and microforms, and about 18,000 serials. 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 MVS/XA under VM/XA; a DEC VAX VMS cluster including an 11780, 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 113 Math Science.

Living Accommodations

From high-rise residence halls to single-dwelling apartments, OSU has all types of housing to meet many preferences. The Iba Graduate House is a 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...
<table>
<thead>
<tr>
<th>Research Centers</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture Experiment Station</td>
<td>139 Agricultural Hall</td>
<td>744-5398</td>
</tr>
<tr>
<td>Agronomy Research Station</td>
<td>101 Agricultural Hall</td>
<td>744-7036</td>
</tr>
<tr>
<td>Caddo Research Station</td>
<td>R.R. Box 42 Fort Cobb, OK 73738</td>
<td>643-2501</td>
</tr>
<tr>
<td>Eastern Research Station</td>
<td>Rt. 1, Box 65A Haskell, OK 74436</td>
<td>918-482-3822</td>
</tr>
<tr>
<td>Irrigation Research Station</td>
<td>Route 1 Altus, OK 73521</td>
<td>482-3459</td>
</tr>
<tr>
<td>Kiamichi Field Station</td>
<td>Rt. 1, Box 228 Idabel, OK 74745</td>
<td>286-5175</td>
</tr>
<tr>
<td>North Central Research Station</td>
<td>Box 141 Lahoma, OK 73754</td>
<td>796-2447</td>
</tr>
<tr>
<td>Pecan Research Station</td>
<td>Sparks, OK 74869</td>
<td>918-866-2263</td>
</tr>
<tr>
<td>Sandyland Research Station</td>
<td>Mangum, OK 73554</td>
<td>787-2046</td>
</tr>
<tr>
<td>Southeast Center</td>
<td>Lane, OK 74555</td>
<td>889-7890</td>
</tr>
<tr>
<td>South Central Research Station</td>
<td>Rt. 3, Box 75 Chickasha, OK 73018</td>
<td>224-4476</td>
</tr>
<tr>
<td>Southwest Agronomy Research Station</td>
<td>Tipton, OK 73570</td>
<td>667-4273</td>
</tr>
<tr>
<td>Noble Research Center for Agriculture and Renewable Natural Resources</td>
<td>139 Agricultural Hall</td>
<td>744-5398</td>
</tr>
<tr>
<td>Vegetable Research Station</td>
<td>Rt. 3, Box 20 Bixby, OK 74008</td>
<td>918-369-2441</td>
</tr>
<tr>
<td>Center for Aerospace Education Services Project</td>
<td>300 North Cordell</td>
<td>744-7015</td>
</tr>
<tr>
<td>Center for Applications and Remote Sensing</td>
<td>107 Thatcher Hall</td>
<td>744-5178</td>
</tr>
<tr>
<td>Center for Automated Design and Manufacturing</td>
<td>218 Engineering North</td>
<td>744-5900</td>
</tr>
<tr>
<td>Center for Consumer Services</td>
<td>016 Human Environmental Sciences</td>
<td>744-7084</td>
</tr>
<tr>
<td>Center for Economic Education</td>
<td>112 Business Building</td>
<td>744-5204</td>
</tr>
<tr>
<td>Center for International Trade Development</td>
<td>204 Center for Intl Trade Development</td>
<td>744-7693</td>
</tr>
<tr>
<td>Center for Local Government Technology</td>
<td>505 Engineering North</td>
<td>744-6049</td>
</tr>
<tr>
<td>Center for Systems Science</td>
<td>321 Engineering South</td>
<td>744-5162</td>
</tr>
<tr>
<td>Community Education Center</td>
<td>303 Gundersen Hall</td>
<td>744-7246</td>
</tr>
<tr>
<td>Electronics Laboratory</td>
<td>104 Electronics Lab</td>
<td>744-6788</td>
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<tr>
<td>Engineering Energy Laboratory</td>
<td>216 Engineering South</td>
<td>744-5157</td>
</tr>
<tr>
<td>Family Study Center</td>
<td>114 Human Environmental Sciences</td>
<td>744-5054</td>
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<tr>
<td>Fluid Power Research Center</td>
<td>118 Fluid Power Research Center</td>
<td>744-7375</td>
</tr>
<tr>
<td>Human Nutrition Center</td>
<td>425 Human Environmental Sciences</td>
<td>744-5040</td>
</tr>
<tr>
<td>Human Resources Development Center</td>
<td>406 Classroom Building</td>
<td>744-6275</td>
</tr>
<tr>
<td>Instructional Materials Center</td>
<td>203 Gundersen Hall</td>
<td>744-7124</td>
</tr>
<tr>
<td>Laser Spectroscopy Facility</td>
<td>232 Physical Science</td>
<td>744-5796</td>
</tr>
<tr>
<td>Materials Synthesis and Characterization Laboratory</td>
<td>227 Physical Science</td>
<td>744-5796</td>
</tr>
<tr>
<td>Natural Resources and Environmental Education Center</td>
<td>306 Gundersen Hall</td>
<td>744-7122</td>
</tr>
<tr>
<td>Oklahoma Industrial Energy Management Program</td>
<td>322 Engineering North</td>
<td>744-6055</td>
</tr>
<tr>
<td>Physical Properties Laboratory</td>
<td>415A Engineering North</td>
<td>744-5282</td>
</tr>
<tr>
<td>Plant Disease Diagnostic Laboratory</td>
<td>115 Life Science East</td>
<td>744-5643</td>
</tr>
<tr>
<td>Statistical Laboratory</td>
<td>301 Math Science</td>
<td>744-5684</td>
</tr>
<tr>
<td>University Center for Energy Research</td>
<td>001 Life Science East</td>
<td>744-5700</td>
</tr>
<tr>
<td>University Center for Water Research</td>
<td>001 Life Science East</td>
<td>744-6995</td>
</tr>
<tr>
<td>Veterinary Medical Research Program</td>
<td>308 Veterinary Medicine</td>
<td>744-6663</td>
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<tr>
<td>Veterinary Research Station</td>
<td>139 Agricultural Hall</td>
<td>744-5398</td>
</tr>
<tr>
<td>Water Quality Research Laboratory</td>
<td>425 Life Science West</td>
<td>744-5551</td>
</tr>
</tbody>
</table>

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.

### Students with Children

Information on child care in the Stillwater community is available at the following locations on campus:

- Family Resource Center-1207 W. McElroy, Anne Benes, Coordinator
- Nontraditional Student Services-060 Student Union, Marie Basler, Coordinator
- Adult Student Organization-030E Student Union
- Student Government Association--040 Student Union

### 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

Knowledge exercises involves complete development of the mind, body and spirit. Opportunities for students to use their free time 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 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 that will assist students so that they may reach their full potential.

Graduate Student Association

The goal of the Graduate Student Association is to improve all aspects of graduate education and graduate student life at OSU. The Association has 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

Tuition and Fees

Refer to the section on "Costs."

Tuition Waiver Policy for Graduate Assistants and Spouses

The University will waive the nonresident tuition for graduate assistants who are employed at least one-fourth time in instruction, research or extension and are enrolled in at least six hours (three hours in the summer).

The nonresident tuition for summer will be waived even if the student is not employed as a graduate assistant for that period if the student held an assistantship for the preceding spring semester.

A spouse of a nonresident student employed as a graduate assistant for at least one-quarter time, is also eligible for a nonresident tuition waiver.

Teaching and Research Assistantships

The University awards numerous teaching and research assistantships with competitive stipends. Fellowship opportunities are available through several programs. 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.

In-state Tuition Waiver Scholarships

This award is also referred to as the general fee waiver.

Eligibility: U.S. citizen or permanent resident; regular admission to a graduate degree program; cumulative grade-point average greater than 3.00.

Application: Successful completion of the Free Application for Federal Student Aid (FAFSA) annually (packet available in Office of Student Financial Aid, 110 Hanner Hall); apply directly to academic departments.

Award: Varies; awards granted by semester.

Deadline: Contact department for deadline.

OSU Foundation Graduate Fellowships

Eligibility: Grade-point average greater than 3.50; acceptance into a graduate degree program; no prior work completed on the particular degree being sought.

Application: Nominations are made by the student's department head.

Award: Variable.

Deadline: Variable.

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 the Free Application for Federal Student Aid (FAFSA). Grants administered and awarded by 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 for Higher Education 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, P.O. Box 54009, Oklahoma City, OK 74154-2054.

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 whether or not they hold 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 awards are offered 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 $1,250 per month, beginning in July. Fellowships are renewable each July 1, and may be continued two 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 Science 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 clinical, technical, food service, or general labor positions. Rate of pay and work schedules vary.

Miscellaneous Sources of Financial Aid

1. Electronic data bases that may have information are:

   Sponsored Programs Information Network (SPIN), a funding information data base that provides access to funding programs from all types of entities—federal, foundations, professional societies, etc.—and access to the
current requests for proposals from those entities. The SPIN data base is located in 001 Life Science East and is available 8-12 and 1-5 Monday through Friday.

Federal Information Exchange, Inc. (FEDIX), an on-line data base retrieval service of government information for colleges, universities and other organizations. It serves to link higher education and the federal government to facilitate research, education and services. FEDIX can be accessed via modem at 1-800-253-3349. Science and Technology Information System (STIS), an electronic dissemination system that provides fast, easy access to National Science Foundation information and publications. Currently not all publications are available, but the user can obtain an index of those that are on the system. The STIS Internet address is stiserv nsf.gov; the Bitnet address is stiserv nsf.

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

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

4. 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.

5. 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 on 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 University Center for Water Research, 003 Life Science East, 405-744-9991.

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 Short-term Loan 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 data base 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 Oklahoma State Department of Education-approved post-bachelor's certification programs for school counselors, psychometrists, reading specialists, and library media specialists. Certification is also offered in speech and language pathology and audiology and in special education (emotionally disturbed and learning disabilities).

Master's degrees are available in most of these programs and doctorates are available in many.

Post-master's level certification programs are available in: elementary school principal; school superintendent; secondary school principal; school psychologist; and school counselor.

Inquiries concerning any aspect of the Teacher Education program should be addressed to the Office of Teacher Education or the head of the department offering the program.

Off-campus Programs

University Center at Tulsa

Oklahoma State University offers graduate courses at the University Center at Tulsa (UCT). All courses offered by OSU faculty are considered resident credit for degrees granted by Oklahoma State University. Courses offered by the other universities participating in UCT can be applied to OSU degree requirements as transfer credit.

The graduate and certification programs approved by the Oklahoma State Regents for Higher Education for Oklahoma State University to offer through the University Center at Tulsa are:

College of Arts and Sciences
M.S. in Computer Science
M.A. in English
Teaching English as a Second Language
College of Business Administration
M.S. in Accounting
Master of Business Administration
M.S. in Economics
College of Education
M.S. in Applied Behavioral Studies
Community Counseling
Emotionally Disturbed
Gifted and Talented
Learning Disabilities
Certification Program in School Psychology
M.S. in Curriculum and Instruction
Curriculum/Supervision
Elementary Education
Reading
Certification Program for School Superintendent
M.S. in Higher Education
M.S. in Occupational and Adult Education
Adult and Continuing Education
Human Resources Development
Vocational Education
M.S. in Trade and Industrial Education
College of Engineering, Architecture and Technology
M.S. in Chemical Engineering
M.S. in Civil Engineering
Construction Engineering and Management
Environmental and Water Resource Engineering
Geotechnical Engineering
Transportation Engineering
M.S. in Electrical Engineering
M.S. in Environmental Engineering
M.S. in Industrial Engineering and Management
M.S. in Mechanical Engineering
Interdisciplinary
M.S. in Environmental Science
M.S. in Natural and Applied Sciences
Aviation and Space Sciences

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 pro-
grams that are available in Stillwater. Prior to enrollment in UCT courses, students should secure approval from their advisers concerning the appropriateness of any courses relative to the 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 may take one-half of the requirements for the master's degree at a Graduate Center provided they comply with the following conditions:

1. Each student working for a degree must comply with requirements for admission given in the Catalog.
2. At least 22 semester credit hours must be completed after the degree plan has been approved by the student's advisory committee and the dean of the Graduate College, and filed in the Graduate College.
3. The thesis or report must be supervised and approved by resident members of the faculty teaching on the Stillwater campus.
4. Final examinations covering the entire graduate program are to be given by a committee selected by the major department and the dean of the Graduate College.
5. The last eight semester credit hours for the degree must be taken on the Stillwater campus unless a written request by the student to take the work at some other place is approved by the head of the major department and the dean of the Graduate College.

**Off-campus Program in Engineering**

A master's degree in engineering may be obtained with all course requirements being met at off-campus centers of Oklahoma State University, the University of Tulsa, and the University of Oklahoma. At least one-half of the hours needed must consist of courses taught by Graduate Faculty members of Oklahoma State University. The remainder of the hours may be made up of transfer credits from the University of Oklahoma earned on campus or at its off-campus centers and/or the University of Tulsa, and a maximum of eight hours of transfer credits from other institutions with approved graduate programs. All other requirements of the regular master's degree, as outlined in the Catalog, must be met.

Such a master's degree has the same designations as the one earned on-campus, except that the transcript will show the wording "Off-campus."

**Extension Credit**

Any student registering in a graduate course to be taken by extension must make application for admission to the Graduate College.

**Correspondence Credit**

Oklahoma State University does not offer graduate courses by correspondence and does not accept credit taken by correspondence toward an advanced degree.

**Interdisciplinary Programs**

**Environmental Science**

Program Coordinator Paul Matthews, 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, physical, and social sciences, and education and engineering 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 solution. The environmental science degree programs at the University are designed to utilize these resources and serve students whose interests transcend the traditional demarcations of knowledge and whose goals include the broad understandings and skills obtained by crossing disciplinary lines in the classroom and laboratory.

Graduates from the environmental science program are expected to have skills and knowledge that are applicable to a wide range of research, management, and planning vocations. Government, industry, and private consulting firms offer employment opportunities for environmental science graduates.

**Programs of Study.** The breadth of offerings at Oklahoma State University affords flexibility to the student interested in specific aspects of the environment. A student can design a unique degree plan to target a particular focus area that meets his or her professional goals. The student's graduate committee assists in this process to help ensure focus, breadth, and quality of the degree plan. Areas of concentration span a variety of areas such as political science, geography, geology, civil and environmental engineering, recreation, forestry, agronomy, and agriculture. The flexibility of this program allows the student to focus on an environmental topic 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 a 12-hour core curriculum consisting of an environmental problem analysis class (ENVIR 5100), an advanced ecology course (ENVIR 5300), and one course each in social science and physical science. A minimum of 18 additional credit hours are selected by the student and his or her committee and adviser. A required thesis covering an environmental problem requires a minimum of six hours to complete this 36-hour degree program. 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 coursework consisting of six hours of a skill component, a doctoral seminar (three credit hours), and 27 credit hours that are selected by the student and his or her committee that reflect the biological, social, and physical aspects of the concentration area. In addition, this course work will include ENVIR 5100 and ENVIR 5300 as designated in the M.S. degree requirements. Research and courses should reflect the student's professional goals. A dissertation focusing on an environmental problem is required and consists of a minimum of 24 credit hours. Specific requirements for the doctoral degree can be obtained from the program coordinator.

**Admission.** To participate in the environmental science program, a student must first make application to the Graduate College. Application materials specific to the environmental science program include a resume, a statement of academic, research and professional goals, three letters of recommendation,
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 ENVR 5100 and two courses outside the major department which provide breadth to the degree program.

The Ph.D. with Environmental Science Emphasis. To obtain a Ph.D. degree with an environmental science emphasis, the student must satisfy minimum degree requirements as specified by one of the cooperating Ph.D.-granting departments (see list below). In addition, the student will be required to take ENVR 5100, a seminar in environmental problem analysis, and two additional courses outside the major department which provide breadth to the degree program.

Admission. To participate in environmental science programs at OSU, a student 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, three letters of recommendation, a resume, and GRE scores. 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 1 for fall enrollment, and July 1 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, a FAFSA must be completed.

Graduate research assistantships are occasionally available through faculty members participating in the environmental science program 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
Agronomy
Animal Science
Biosystems and Agricultural Engineering
Botany
Chemical Engineering
Chemistry
Civil and Environmental Engineering
Curriculum and Instruction
Design, Housing and Merchandising
Economics and Legal Studies in Business
Entomology
Forestry (M.S. only)
Geography (M.S. only)
Geology (M.S. only)
Health, Physical Education and Leisure
Industrial Engineering and Management
Plant Pathology
Political Science (M.A. only)
Sociology
Zoology

Steering Committee
Principal Members
Lowell Caneday, Leisure
Douglas C. Kent, Geology
James J. Lawler, Political Science
Paul Matthews, Geography
Edwin L. Miller, Forestry
Terence J. Mills, Curriculm and Instruction
Patricia E. Norris, Agricultural Economics
Kent W. Olson, Economics and Legal Studies in Business
Larry Perkins, Sociology
Michael Smolen, Biosystems and Agricultural Engineering
John N. Veenstra, Civil and Environmental Engineering
Sue E. Williams, Design, Housing and Merchandising
Alternate Members
Nick Basta, Agronomy
Glenn Brown, Biosystems and Agricultural Engineering
Kay Bull, Educational Psychology
Brian Carter, Agronomy
Christine Cashel, Leisure
William Henley, Botany
Thomas Hennessey, Forestry
Michael Hirlinger, Political Science
Arthur Hounslow, Geology
Sarah Kirby, Design, Housing and Merchandising
Charles Leider, Horticulture and Landscape Architecture
Lee Maril, Sociology
Michael Palmer, Botany
Michael Parle, Political Science
James Shaw, Zoology
Stephen Stadler, Geography
Art Stoecker, Agricultural Economics
Greg Wilber, Civil and Environmental Engineering
Keith Willett, Economics and Legal Studies in Business

(Specific requirements for degree programs can be obtained from the program coordinator in the Graduate College.)

Food Science
Animal Science
Professor and Head Donald G. Wagner, Ph.D.
Biochemistry and Molecular Biology
Professor and Head James B. Blair, Ph.D.
Microbiology and Molecular Genetics
Professor and Head Robert V. Miller, Ph.D.
Nutritional Sciences
Professor and Interim Head Barbara Stoecker, 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, biochemistry, dairy science, food science, human nutrition, microbiology or poultry science. Students majoring in other curricula may qualify by remedying 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 and Applied Sciences
Program Coordinator Paul Matthews, Ph.D.

The Master of Science degree in natural and applied sciences is a unique program designed to address the needs of the student who desires a strong interdisciplinary perspective and who has personal and professional goals which may not be addressed in traditional departmental degree programs.

The natural and applied sciences program has four areas: natural sciences, aviation and space sciences, gerontology, and interdisciplinary sci-
Application to the Program. A faculty advisory committee, in conjunction with the program coordinator, will evaluate applications for admission. A student seeking admission to the program must submit the following material to the program director:

1. An official Graduate College application for admission;
2. Official transcripts for all college-level courses;
3. A written statement of personal goals and professional objectives to be obtained from the program;
4. Three letters of recommendation describing abilities, interest and motivation of the applicant;
5. All international students must also submit:
   a. A TOEFL score of 550 or greater;
   b. A financial statement of available funds as currently required by OSU.

The student should indicate in the written statement the area in which he or she is interested. However, a formal declaration is not mandatory until the course plan of study is filed at a later date. Additional criteria may be required. Any request for exceptions to the stated criteria should be addressed to the program director.

Graduate Student Committee. Each area has an interdisciplinary faculty advisory committee whose members will assist the student in selecting courses for the plan of study and who will supervise the research component of the degree program. Faculty outside the advisory committee may be selected to assist the student with the research component.

Advisory Committees

Natural Sciences
Margaret Ewing, Zoology
Andrea Arquitt, Nutritional Sciences
Aviation and Space Sciences
Jo Campbell, Applied Behavioral Studies
Kenneth Wiggins, Aviation and Space Education
Cecil Dugger, Aviation and Space Education
Paul Harper, Speech Communication
Interdisciplinary Sciences
Kent Olson, Economics and Legal Studies in Business
Gerontology
Ed Arquitt, Sociology
Joe Weber, Family Relations and Child Development
Gladene Allred, Applied Behavioral Studies

Robert Nolan, Occupational and Adult Education
Nancy Monroe, Speech Pathology

Plan of Study. The minimum number of hours required to earn the master's degree in natural and applied sciences varies by the area selected and varies from 30 to 36 credit hours. The format for each is delineated below. At least 21 credit hours must be at the graduate level (courses numbered 5000 or above). Up to nine graduate credit hours can be transferred from a regionally-accredited graduate program with consent of the advisory committee.

Time Limit. Students are expected to complete the requirements for the degree within four years after filing the plan of study (i.e., the semester in which the 17th hour of the program is completed).

Research Component. For the thesis plan, the student must present a proposal to the advisory committee for approval prior to completing 22 hours in the program. The thesis should be investigative research. The written proposal should contain an introduction, literature review, and the methodology and research questions or hypotheses proposed to develop the thesis. A copy of the approved thesis proposal must be filed with the program director. A grade of "B" or better must be earned in thesis hours.

In the areas allowing a creative component, the topic must be approved by the advisory committee. Students must earn a grade of "B" or above in the course designated as the creative component.

In the areas allowing a report, students are expected to apply the theory and research methodology that they have acquired in the program to a topic approved by the advisory committee. In most cases, this topic will relate to the individual's professional interests. Students do not enroll in report hours until a topic is approved. A student must earn a grade of "B" or better for the report.

Programs of Study. Natural Sciences. This program 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.

To enter the program, the student should have a minimum of 30 credit 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.

Three degree plans are available in this program. The student must complete either 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-credit-hour plan with a creative component.

Particular courses are not specified for the degree, the student's advisory committee assists the student in selecting appropriate courses. 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.

Aviation and Space Sciences. Students will take a minimum of 11 credit hours of core courses from research, organizational theory, and administration and management. The remaining courses, to total a minimum of 32 credit hours, will come from the multidisciplinary course list or additional courses from the core list. Other courses may substitute upon approval from the advisory committee. Students may select the research component-thesis, report, or creative component-with approval of the advisory committee. Six credit hours are allowed for the thesis option and two credit hours are allowed for the research report. Credit hours allowed for the creative component varies.

Interdisciplinary Sciences. This program is for students who desire to increase their competence in a particular thematic area by taking a series of courses in several disciplines. This multidisciplinary approach provides educational opportunities for a variety of careers.

This program offers three choices in obtaining the master's degree: (1) a 30-credit-hour program, including six hours for a thesis; (2) a 32-credit-hour program including a creative component, which may be a special research report, an annotated bibliography, a project in research or design, or other creative activity; and (3) a 32-credit-hour program including two credit hours for a report. The advisory committee must approve the plan under which the student will pursue the degree.

Interdisciplinary sciences consists of no fewer than three separate fields of study with at least six hours in each field. No more than 15 hours may be taken in any one area. The advisory committee will assist the student in formulating the plan of study.

Gerontology. In addition to the general admission criteria, students in gerontology must meet three conditions to be eligible for admission:

1. Overall grade-point average of at least 3.00;
2. GRE score with a 900 minimum score (total verbal and quantitative) or an MAT score of at least 35.
Gerontology offers two plans to obtain a master's degree. The first plan requires 36 credit hours, including a creative component and/or an internship. The second plan includes a thesis and requires a minimum of 33 credit hours, including six hours for the thesis. The student's advisory committee will assist the student in selecting the courses for the plan of study which best address the student's professional and personal goals.

Gerontology Graduate Certificate. The graduate certificate in gerontology, approved by the Oklahoma State Regents for Higher Education, will provide documentation that students have completed a program of instruction and educational experiences in the field of gerontology at the graduate level.

Admission into the program is based on the following criteria:

1. Applicants must have met the University's graduate admission requirements and be currently pursuing a master's or doctoral degree from one of the academic departments at OSU.
2. A student who has already completed a master's or doctoral degree from Oklahoma State University or another accredited institution would also be eligible to complete the gerontology certificate requirements.
3. Students must complete a minimum of 21 graduate credit hours involving at least six different courses of formal instruction, in addition to three credit hours of creative or basic applied research activities related to aging populations.

Upon satisfactory completion of the program, students will receive a certificate and a notation on their transcripts. For more information, contact the Graduate College, 202 Whitehurst, or the Department of Family Relations and Child Development, 242 Human Environmental Sciences.

Financial Assistance. In-state fee waiver scholarships are available on a limited basis for eligible students. Interested students should contact the program director in the Graduate College. Eligibility criteria include Oklahoma residency, enrollment in residence credit hours, admission into the program, and successful completion of the FAFSA form for the academic year in which the student is seeking aid. The FAFSA packets are available in the Office of Student Financial Aid, 110 Hanner Hall.

Telecommunications Management

Program Coordinator Ramesh Sharda, Ph.D.

In response to industry's need for skilled and knowledgeable telecommunications management graduates, Oklahoma State University offers a Master of Science degree in telecommunications management. This program is offered not only through traditional means to on-campus students but also via distance learning technologies to students at remote locations.

The telecommunications management program draws on the combined expertise of three OSU colleges—the College of Arts and Sciences, the College of Business Administration, and the College of Engineering, Architecture, and Technology. As a result, the telecommunications management student will have a traditional home department to achieve a depth of knowledge in one discipline, while developing broad knowledge in business, technical and communication disciplines.

This program prepares graduates for managing the telecommunications technologies as well as managing in a competitive environment with telecommunications systems. The graduates of this program are likely to be employable by providers or users of telecommunications technologies.

Telecommunications Management Curriculum. The program curriculum consists of 33 credit hours, including seven core courses, one laboratory, one practicum, and three electives. Students may choose either a part-time or full-time sequence. Full-time students can complete the program in one and one-half years while part-time students may be able to complete it in two years.

Students may choose electives from one of two tracks. Track I is the technical track consisting of computer science, electrical engineering, or management science and information systems courses. Track II is the management/mass communications track consisting of management, decision analysis, or mass communications courses.

Admission Requirements. Qualified graduates of colleges and universities of recognized standards are eligible to seek admission to the OSU Graduate College. Applicants must submit the completed application form to the Graduate College with official transcripts of all academic work and degrees received.

In addition to the OSU Graduate College's standard requirements, the telecommunications management program admissions committee will consider students' letters of recommendation, GMAT or GRE scores, previous academic performance, and telecommunications experience.

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, agro- and 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.

Manufacturing Systems Engineering

This interdisciplinary master's degree is designed to address the needs of manufacturing managers, particularly those in small- to medium-sized firms, in all aspects of manufacturing systems, in-
including management as well as the hardware aspects of manufacturing.

Jointly sponsored by the schools of Electrical and Computer Engineering, Industrial Engineering and Management, and Mechanical and Aerospace Engineering, this program produces graduates capable of direct contributions in the design, selection, and implementation of up-to-date computerized manufacturing systems.

To pursue this degree a student enrolls in one of the three schools listed above and is advised by a faculty member in that school. The student's advisory committee is composed of members from each of the three schools. For more information students should contact the program coordinator in the School of Industrial Engineering and Management.

**General Regulations**

Full authority on all academic decisions within the Graduate College rests with the dean of the Graduate College. The Graduate College policies and procedures described in the Catalog are for informational purposes. They are subject to regular review and may be revised at procedures described in the Catalog.

**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. Admission to a specific graduate program obligates the student to adhere to the policies of that program.

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 Faculty 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 Faculty Council to evaluate reasons for requesting a waiver and to make a decision concerning departure from normal Graduate College regulations.

**Admission to the Graduate College**

Qualified graduates of colleges and universities of recognized standing are eligible to seek admission to the Graduate College. Applicants must submit the completed application form to the Graduate College, with official transcripts of all academic work and degrees received.

1. The student should request all institutions previously attended to send two copies of the official transcript to the Graduate College, Oklahoma State University.
2. To be official, the transcript must show the complete scholastic record, bear the official seal of the institution, and be signed by the issuing officer.

To assure adequate time, application forms and transcripts should be received by the Graduate College at least 30 days prior to expected enrollment. The application fee must accompany the Application for Admission. Transcripts and other credentials become the property of the University.

**Standardized Test Scores**

Many departments require standardized test scores, such as the Graduate Record Examination. Applicants must contact the appropriate department head for information regarding departmental requirements for these tests. (Refer to the table “Graduate Admission Requirements.”)

**International Student Admission**

International applicants are expected to submit applications, financial affidavits, transcripts, and results of the Test of English as a Foreign Language (TOEFL) examination by March 1 for fall enrollment and by July 1 for spring enrollment. TOEFL. As a condition of admission to regular graduate study at OSU, all persons for whom English is a second language are required to present a score of 550 or above on the TOEFL regardless of the number of semesters or terms completed in other institutions of higher education, including OSU, or prior enrollment in English language programs. Some departments require a score above 550. Students should contact the department for specific TOEFL requirements. Persons who present a TOEFL score of 500 or above and who demonstrate unusual academic promise may be admitted to graduate study on probationary status, but the number of such persons will not exceed two percent of the regularly enrolled graduate student population of the previous fall semester.

Submission of the TOEFL score with the application is never waived.

**English Proficiency Test for International Students.** Before international students who have no prior course work from a U.S. university can complete their first enrollment at Oklahoma State University, they are required to take the Test of English Language Proficiency (TELP) administered by the University Testing and Evaluation Service. This test, scheduled on campus before each semester and summer session, is required in addition to the TOEFL. Should a student’s composite score on the TELP indicate a need for further work in English, the student is required to enroll in a nongraduate-credit English course until the deficiency is removed. This enrollment is concurrent with courses enrolled in for the advanced degree.

**Spoken English Proficiency for Employment.** OSU policy requires all persons for whom English is a second language to demonstrate an acceptable level of spoken English before being employed in an instructionally related capacity. Employment requires a score of 220 or above on the Test of Spoken English (TSE). Other spoken English examinations are not acceptable as substitutes for the 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.

**International Teaching Assistant Program.** Any international teaching assistant who has not taught in the classroom is required to participate in the international teaching assistant orientation and evaluation workshop offered at the beginning of the fall and spring semesters. Students must receive an evaluation of “pass” or “provisional pass” prior to teaching in the classroom. For further information, contact the Office of the Vice President for Research and Dean of the Graduate College, 203 Whitehurst.
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 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 gradu -

Graduate Admission Requirements

Requirements are subject to departmental revision. 1 Test is required, 2 Test is recommended, 3 GRE or Miller may be interchanged, with departmental consent, 4 GRE or GMAT may be interchanged. Note: All applicants must submit references to department.

<table>
<thead>
<tr>
<th>Major</th>
<th>Degree</th>
<th>GRE Gen Sub</th>
<th>Miller</th>
<th>Additional Requirements</th>
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<tr>
<td>AGRICULTURAL SCIENCES AND NATURAL RESOURCES</td>
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<td>(Theater)</td>
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<td>Statistics</td>
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Graduate College
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<th>GMAT</th>
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<td>PhD</td>
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<td>Civil Engineering</td>
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<td>Food Science</td>
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<td>Telecommunications Management</td>
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<td>VETERINARY MEDICINE</td>
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<td>Physiological Science</td>
<td>MS, PhD</td>
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<td>GPA last 60 hrs. B.S. X GRE must equal 3000 or above for MS or 3150 or above for PhD. Gpa last 60 hrs. x General score on GRE must equal 3000 or above for unqualified admission.</td>
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<td>Veterinary Parasitology</td>
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<td>GMAT required, high GPA, 3 letters of recommendation.</td>
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</table>

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 approval 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 master's degree. Doctoral candidates cannot transfer more than nine hours from a non-doctoral degree-granting institution.

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 re-register for admission. A student who也希望 Interrupts enrollment for one year must re-enroll for the upcoming academic year.

Audit

A student who does not wish to receive credit in a course may, with the approval of the student's advisor and the instructor of the course concerned, attend the class strictly as a visitor. A student who applies to audit a course promises that he or she will not use the audit 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.)

If a student is already enrolled for credit in a course, but wishes to change to auditing that course, the student must officially drop the course (or, if appropriate, withdraw), at the time the student changes to audit.

A student who has established a permanent record at OSU may have the audited course recorded on his or her transcript with "AU" appearing in place of the grade. Not later than one week after the close of that semester, the student must present to the Office of the Registrar the instructor's copy of the audit form with a signed statement from the instructor, on the reverse side, that it is appropriate for the course to be recorded on the student's transcript. Any individual 65 years or older may audit a class at no charge.

Enrollment

Students with a bachelor's degree are expected to register in the Graduate College unless they want to obtain another bachelor's degree. If they register as an undergraduate, the courses taken cannot be given graduate credit at a later date.

Students in the Graduate College may enroll in a course which does not carry graduate credit or audit courses if such courses are recommended by an adviser and approved by the dean of the Graduate College.

Students who desire to enroll concurrently in another institution or by extension at OSU must secure approval in advance from the dean of the Graduate College. Forms are available in the Graduate College.

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

Students will be permitted to enroll (late fee will be charged) or to add a course through the first week of a regular semester or third day of a 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 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 use 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 Registrar. Students may use the toll-free number 1-800-227-GRAD.

Minimum and Maximum Hours of Enrollment

Any graduate student using the facilities and faculty resources of the University must be enrolled. Every graduate student is expected to satisfactorily complete no fewer than six semester credit hours during the academic year (fall, spring and summer) until the degree is awarded. Students may satisfy this requirement by enrolling for the required hours during any one term or by continuous enrollment during the three terms.

The total registration shall not exceed 18 credit hours for a semester or nine credit hours for a summer session. Regardless of the number of hours taken, a student may not count more than 16 credit hours taken in the fall or spring semester nor more than nine semester credit hours earned in a summer session toward a degree. For short-course sessions less than eight weeks in length, enrollment shall not exceed one credit hour for each week. Students in the Graduate College who are not taking any courses for graduate credit may register for the number of credit hours recommended by their advisers and approved by the dean of the Graduate College.

Faculty Members. No member of the faculty, with the rank of associate professor or above or equivalent rank at the time of completing the requirements, may be granted a degree from this institution. This regulation applies to faculty members in the schools of engineering holding the rank of assistant professor or above.

Enrollment Regulations for Graduate Assistants and Fellows. Graduate students employed by the University part-time may register only for the amount of credit recommended by the head of the major department and approved by the dean of the Graduate College. In general, students employed 22 hours per week may not register for more than 10 semester credit hours of course work for a semester and five hours during a summer session. Other employment will permit registration for an appropriate number of hours.
of hours. Graduate students whose employment is such that results will be used for a thesis, however, may register for additional thesis credit as recommended by the research adviser and approved by the dean of the Graduate College.

Any graduate student holding an assistantship or fellowship must enroll in at least six resident semester credit hours during the fall and spring semesters and at least three resident semester credit hours for each summer session.

If a graduate assistant enrolls in more credit hours than allowed for percentage of time employed, a petition for excessive credit hours for each summer session.

### Enrollment and Financial Assistance

For the purpose of receiving monetary assistance through the Office of Student 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.

### 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 courses designated as the creative component. 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

Grades below "B" are considered below the acceptable standard for graduate students. Any student who receives such a grade will be sent a letter of warning from the Graduate College. If a student’s overall GPA drops below a 3.00, the student is subject to being placed on strict academic probation. A student on strict academic probation is required to earn a minimum grade of "B" in each course during the next semester of full-time enrollment or two semesters of part-time enrollment. Failure to do so may result in suspension from the University.

Departments are notified when students in their programs have been given academic warnings, been placed on strict academic probation, or been suspended. The department has the option to request that the student be granted a one semester reprieve from an academic suspension. However, further requests are 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 that are identified by an asterisk 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 Regulations

Refer also to the sections on "Adding Courses," "Dropping Courses," and "Withdrawing from the University."

#### Graduate-credit Courses

Courses numbered 5000 and above are primarily for graduate students, and only graduate students and seniors who have obtained prior approval may enroll. The majority of courses on the master’s and doctoral plans of study will be 5000 level and above.

Courses numbered 3000 and 4000 that are identified by an asterisk in the "Course Listings" of the Catalog can be taken by graduate students. Graduate students enrolled in these courses will be
for continuance of students who have violated conditions of their probations are not usually granted.

Dismissal. Any student who is dismissed from the Graduate College for academic reasons, will have the notation “Academic Suspension” printed on the official OSU transcript.

Grades for Thesis (5000) and Dissertation (6000). The grade of “X,” 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 “X,” 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.

The “X” grade can also be assigned in a course identified as the creative component portion of a master’s degree. Each department in which a creative component is an option has identified one class in which “X” may be assigned if more than one semester is required to complete the creative component. Upon completion of the creative component, the adviser submits a Change of Grade form to have the final grade entered.

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” and “F.”

Graduate students may take a course utilizing the Pass-No Pass grading system with the consent of their major advisers 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” or contact the Office of the Provost and Vice-President for Academic Affairs 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 procedure toward graduation by the Graduate College and the Office of the Registrar. The student is billed for the graduation fee along with tuition. If all requirements for the degree are not 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 are to be submitted during 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 the Office of the Registrar when all requirements for the degree have been satisfied. Such a statement will not be issued until all grades for the semester have been recorded.

Master’s Degree Programs

Accounting, MS
Agricultural Economics, MS
Agricultural Education, MS
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 and Molecular Biology, MS
Biosystems Engineering, MBioE, MS
Botany, MS
Business Administration, MBA
Chemical Engineering, MChemE, MS
Chemistry, MS
Civil Engineering, MCivilE, MS
Computer Science, MS
Corrections, MS
Counseling and Student Personnel, MS
Curriculum and Instruction, MS
Design, Housing and Merchandising, MS
Economics, MS
Educational Administration, MS
Electrical Engineering, MElecE, MS
English, MA
Entomology, MS
Environmental Engineering, MEnvrE, MS
Environmental Science, MS
Family Relations and Child Development, MS
Food Science, MS
Forest Resources, MS
General Engineering, MGenE, MS
Geography, MS
Geology, MS
Health, Physical Education and Leisure, MS
Higher Education, MS
History, MA
Horticulture, MS
Industrial Engineering and Management, MIE Mgmt, MS
Manufacturing Systems Engineering, MMSE
Mass Communications, MS
Mathematics, MS
Mechanical Engineering, MMechE, MS
Microbiology, Cell and Molecular Biology, MS
Natural and Applied Sciences, MS
Nutritional Sciences, MS
Occupational and Adult Education, MS
Philosophy, MA
Physics, MS
Physiological Science, MS
Plant Pathology, MS

162 Graduate College
Abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA</td>
<td>Master of Arts</td>
</tr>
<tr>
<td>Mag</td>
<td>Master of Agriculture</td>
</tr>
<tr>
<td>MArch</td>
<td>Master of Architecture</td>
</tr>
<tr>
<td>MArchE</td>
<td>Master of Architectural Engineering</td>
</tr>
<tr>
<td>MBA</td>
<td>Master of Business Administration</td>
</tr>
<tr>
<td>MbioE</td>
<td>Master of Biosystems Engineering</td>
</tr>
<tr>
<td>MChemE</td>
<td>Master of Chemical Engineering</td>
</tr>
<tr>
<td>MCivilE</td>
<td>Master of Civil Engineering</td>
</tr>
<tr>
<td>MElecE</td>
<td>Master of Electrical Engineering</td>
</tr>
<tr>
<td>MEnvirE</td>
<td>Master of Environmental Engineering</td>
</tr>
<tr>
<td>MGenE</td>
<td>Master of General Engineering</td>
</tr>
<tr>
<td>MIE Mgmt</td>
<td>Master of Industrial Engineering Management</td>
</tr>
<tr>
<td>MMSE</td>
<td>Master of Manufacturing Systems Engineering</td>
</tr>
<tr>
<td>MMechE</td>
<td>Master of Mechanical Engineering</td>
</tr>
<tr>
<td>MS</td>
<td>Master of Science</td>
</tr>
</tbody>
</table>

Admission to a Program. Some departments require that any student seeking a master's degree take an examination (e.g., GRE, GMAT) before being admitted to a program of study. See the table on "Graduate Admission Requirements" or contact the head of the major department.

Basic Requirements. The master's degree may be earned by one of three plans:
- Plan I-with thesis, 30 credit hours, consisting of 24 hours of course work and six hours of research;
- Plan II-with report, 32 credit hours, consisting of 30 hours of course work and two hours of research;
- Plan III-with no thesis or report, 32 credit hours of course work including the creative component. The Plan III program must contain a creative component which is explicitly identified on the plan of study.

For example, the creative element may be a special report, an annotated bibliography, a project in research or design, or other creative activity.

The number of credits specified for each plan are minimums set by the Graduate College. Departmental requirements may exceed these.

The major department, with the approval of the dean of the Graduate College, decides which alternatives are open to the candidates. Some departments also require a minimum number of semester credit hours of upper-division and graduate courses in the major field, including courses taken as an undergraduate.

Residence Requirements. Candidates for a master's degree must complete a minimum of 21 semester credit hours in residence if they follow Plan I, or 23 semester credit hours if they follow Plan II or III.

Nine semester credit hours of the 30 or 32 required for the degree may be completed: (1) by residence courses taken at an accredited college or university, (2) by extension or in-service courses from Oklahoma State University or from another accredited institution, or (3) by a combination of these methods. Students may petition the dean for exceptions and deviations. Courses taken in Stillwater through the OSU extension program are not considered as residence credit.

The last eight semester credit hours for the degree must be taken on the Stillwater campus unless a written request is made by the student to take the work at another location is approved by the head of the major department and the dean of the Graduate College.

Advisement. The student should go to the department head, who may assign an adviser or advisory committee to assist the student in planning and pursuing the entire program for a degree. The advisory committee must include a minimum of three members of the Graduate Faculty.

Level of Courses Applied to Graduate Degree. Graduate students must enroll in no fewer than 21 semester credit hours of 5000- and 6000-level courses through Oklahoma State University as presented on the plan of study to meet requirements for the master's degree.

Plan of Study. The preliminary plan of study for the degree must be filed in the Graduate College prior to completion of the 17th graduate credit hour for students working for a master's degree in residence. 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.

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.

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 requirement.

Written Examinations. Some departments require a written examination covering the major and minor fields. It is usually taken before the thesis or report has been completed. Arrangements for taking the examination should be made with the department at least three weeks in advance. The written examination must
be passed before a final examination is scheduled.

A student who fails all or part of the written examination should consult the chairman of the examination committee to find out what must be done before taking another examination.

**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 format specifications set forth in this manual. The style of the document is to be determined by the advisory committee and should be reflective of publications in the student’s discipline.

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. 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”).

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. 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”). 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.* The final copy of the report, must be submitted to the Graduate College no later than the stated deadline (see “Graduate College Calendar”).

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**Summary of Procedure for Master's Degree**

Dean-Dean of Graduate College; GCO-Graduate College Office; DH-Department Head; TA-Temporary Adviser; Adviser-Person designated by department head to advise; Comm-Committee

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Approved by</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply for admission. (Follow instruction sheet carefully. If relevant, see &quot;Requirements for Admission to Teacher Education&quot; in the &quot;College of Education.&quot;)</td>
<td>Dean</td>
<td>Complete 30 days prior to enrollment. (60 days prior for international students.)</td>
</tr>
<tr>
<td>2. Read &quot;General Regulations&quot; and &quot;Master's Degree&quot; sections, then secure registration materials in the Graduate College.</td>
<td>GCO</td>
<td></td>
</tr>
<tr>
<td>3. Secure assignment of a temporary adviser from major department head and enroll for the first semester.</td>
<td>DH TA Dean</td>
<td></td>
</tr>
<tr>
<td>4. Plan program with advice of department head or designated Graduate Faculty member and submit plan of study.</td>
<td>Adviser Dean</td>
<td>Prior to completing the 17th credit hour.</td>
</tr>
<tr>
<td>5. Proceed with course work and research assignment.</td>
<td>Adviser</td>
<td></td>
</tr>
<tr>
<td>6. Complete the Application for Diploma card at the time of enrollment; make any corrections needed on plan of study.</td>
<td>GCO</td>
<td>At the time of enrollment for the semester or session in which the degree is to be conferred. (Application is good for stated degree date only. File new application if conferring of degree is delayed.)</td>
</tr>
<tr>
<td>7. Take comprehensive written examinations as required by major department.</td>
<td>Adviser</td>
<td></td>
</tr>
<tr>
<td>8. Complete research, prepare final draft copy of thesis or report and submit it at least one week prior to the final examination, along with a copy of the abstract, to each member of the examining committee and to the Graduate College. The final draft must be complete and legible. Ordinary proofreading marks and minor handwritten additions, changes, etc. are permitted, but the copy should be in such condition that it can be read easily and understood clearly. The style should be determined by the advisory committee. The <em>Graduate College Style Manual</em> lists specific requirements for formatting the document. The adviser must sign the copy submitted to the Graduate College.</td>
<td>Dean Adviser</td>
<td>Deadlines published yearly.</td>
</tr>
</tbody>
</table>
Human Subjects and Research. Oklahoma State University follows federal guidelines which require a review of any research involving human subjects. All such research must be approved by the Institutional Review Board (IRB) before human subjects are involved. Guidelines on how to obtain permission to use human subjects in research are available from the departmental graduate coordinator or the executive secretary of the IRB, the Graduate College, or Office of the Vice-President for Research. The information provides examples of activities subject to careful review and those which are easily approved.

Because University policy requires prior approval of all research involving human subjects, the letter from the IRB granting approval of the research must be included in the appendix of any thesis or dissertation submitted to the Graduate College in fulfillment of degree objectives. Failure to obtain approval for use of human subjects means that the thesis or dissertation cannot be accepted.

Final Examination. If the thesis or report option is used, the dean of the Graduate College arranges with the major department for the final examination after the draft copy of the thesis or report has been filed in the Graduate College and distributed as described in the preceding section. The final examination may be oral or written or both.

A student who fails to pass either a written or oral final examination should consult the chairman of the examining committee. Another examination cannot be given for two months after a failure, and a department may limit the number of times that the examination may be repeated.

If the non-thesis option is used, the department head or adviser must notify the dean of the Graduate College that the student has satisfactorily completed all departmental requirements. If the department requires a final oral and/or written examination, forms for arranging the examination can be obtained from the Graduate College. Both positive and negative results must be reported to the Graduate College.

Time Limit. Students are expected to complete the requirements for the master's degree within four years after filing the plan of study (i.e., the semester in which the 17th hour of the program was completed). Any extension of this time limit must be approved by the Graduate Faculty Council.

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
- Animal Breeding and Reproduction
- Animal Nutrition
- Applied Behavioral Studies
- Biochemistry and Molecular Biology
- Biosystems Engineering
- Botany
- Business Administration
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science
- Crop Science
- Economics
- Electrical Engineering
- English
- Entomology
- Environmental Science
- Food Science
- General Engineering
- History

## Summary of Procedure for Doctoral Degree

**Dean-Dean of Graduate College; DH-Department Head; TA-Temporary Adviser; Comm-Committee; Ch-Chair of Committee**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Initiate through</th>
<th>Approved by</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply for admission. (Follow instruction sheet carefully.)</td>
<td></td>
<td>Dean</td>
<td>Complete 30 days prior to enrollment (60 days prior for international students).</td>
</tr>
<tr>
<td>2. Secure assignment of a temporary adviser from major department head and enroll.</td>
<td>DH TA</td>
<td>Dean</td>
<td></td>
</tr>
<tr>
<td>3. Request the appointment of advisory committee.</td>
<td>TA</td>
<td>Dean</td>
<td></td>
</tr>
<tr>
<td>4. Prepare plan of study with assistance of committee. Submit three approved copies to Graduate College.</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>
<td></td>
</tr>
<tr>
<td>5. Fulfill foreign language requirement or attain other required proficiencies.</td>
<td></td>
<td></td>
<td>Prior to qualifying examination.</td>
</tr>
<tr>
<td>6. Complete major portion of course work and plan dissertation program with committee. Submit copy of approved dissertation outline to Graduate College.</td>
<td>Ch Dean</td>
<td>As early in the research stage as possible.</td>
<td></td>
</tr>
<tr>
<td>7. Apply for and take qualifying examination.</td>
<td>Ch</td>
<td></td>
<td>As early in the doctoral program as feasible.</td>
</tr>
<tr>
<td>8. 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>
<td></td>
</tr>
<tr>
<td>9. 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>
<td></td>
</tr>
</tbody>
</table>
### Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Approved by</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Complete the Application for Diploma card at the time of enrollment.</td>
<td>Dean</td>
<td>At the time of enrollment for the semester or session in which the degree is to be conferred. (Application is good for stated time only. File new application if conferring of degree is delayed.)</td>
</tr>
<tr>
<td>11. 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 proof-reading 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; however, the style is to be determined by the advisory committee. The adviser must sign the copy submitted to the Graduate College.</td>
<td>Ch</td>
<td>Deans published yearly.</td>
</tr>
<tr>
<td>12. Schedule dissertation defense. Committee chairperson notifies Graduate College of the results immediately following conclusion of the examination.</td>
<td>Ch</td>
<td>Deans published yearly.</td>
</tr>
<tr>
<td>13. Make any changes in dissertation required by examining committee and by the Graduate College. Advisory committee members sign final copies of dissertation. The Graduate College makes the final decision on acceptance of the dissertation. Candidate submits three approved copies of the dissertation and six approved copies of the abstract.</td>
<td>Ch</td>
<td>Deans published yearly.</td>
</tr>
<tr>
<td>14. Pay binding and microfilming fees in the Office of the Bursar; complete questionnaire and microfilming agreement form and return all forms to the Graduate College.</td>
<td>Ch</td>
<td>Form to be obtained from the Graduate College after dissertation has been formally accepted by that office.</td>
</tr>
<tr>
<td>15. Rent or buy cap, gown, and hood at Student Union Bookstore and attend Commencement.</td>
<td>Ch</td>
<td>Deans published yearly.</td>
</tr>
</tbody>
</table>

### Approved Programs

- Animal Science
- Human Environmental Sciences (Design, Housing and Merchandising; Family Relations and Child Development; Nutritional Sciences)
- Industrial Engineering and Management
- Mathematics
- Mechanical Engineering
- Microbiology, Cell and Molecular Biology
- 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.
Temporary Adviser. At the beginning of a student's doctoral program, the head of the major department will designate a member of the Graduate Faculty to serve as temporary adviser to the student. The temporary adviser will arrange the collection of information about the student and assist him or her in the early selection of courses.

Advisory Committee. Upon recommendation of the head of the major department or of the graduate committee of the department, an advisory committee of not fewer than four members will be appointed by the dean of the Graduate College. The duties of the advisory committee consist of (1) advising the student, (2) assisting the student in preparing a plan of study, (3) preparing and administering the qualifying examination, (4) assisting in planning and conducting the research, (5) supervising the writing of and passing upon the dissertation, and (6) conducting the final examination.

The major adviser of the advisory committee must be a full member of the Graduate Faculty. Under special circumstances, the dean of the Graduate College may approve a substitute adviser. 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 chairperson for a conference with the committee. During the conference, the preparation and qualifications of the student for graduate work will be discussed and appropriate plans made for future study.

Plan of Study. After the preliminary conference, the student should complete the plan of study for the degree, have it approved by the advisory committee, file three copies in the Graduate College.

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 dissertation credit. Forms for preparing the plan of study may be obtained in 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.

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) pass a final examination, and (5) comply with other requirements of the major department.

Residence Requirements. A minimum of 30 semester credit hours must be taken in residence at Oklahoma State University. All credit accepted toward the degree beyond the master's degree must be on the student's plan of study and be approved by the advisory committee.

One year of the last two years must be spent in continuous residence at this institution.

With prior approval by the advisory committee, the student may do research for the degree in absentia. Research conducted while not in residence is under the supervision of the major adviser and the advisory committee.

Courses taken at the University Center at Tulsa (UCT) while registered through Oklahoma State University are considered residence credit. Courses taken from the other three cooperating universities are considered to be transfer credit.

Language Requirement. Foreign language or other proficiency requirements may be specified to meet the need for specific skills and areas of knowledge that facilitate research and contribute to wider understanding. Specific requirements are determined by degree-granting departments or programs. In many fields, a reading knowledge of one or two modern foreign languages is an important part of scholarship and necessary for research. In other fields, proficiency in special and related disciplines may be required that will contribute to the needs of the individual program.

Qualifying Examination. The qualifying examination is comprehensive, covering the entire area of the student's graduate study. The examination may be written, oral or both. The examination must be passed not less than six months before the degree is granted (see "Admission to Candidacy"). The results of the examination are reported to the Graduate College on Form G-4.

Before taking the qualifying examination, the student must have an approved plan of study on file in the Graduate College, and have the approval of the advisory committee.

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 dissertation outline filed in the Graduate College.

Dissertation. A dissertation (doctoral thesis) is required of each doctoral can-
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 dissertation 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 dissertation adviser. The final draft copy must be submitted to the Graduate College no later than the stated deadline date (see "Graduate College Calendar").

Human Subjects and Research. Oklahoma State University follows federal guidelines which require a review of any research involving human subjects. All such research must be approved by the Institutional Review Board (IRB) before human subjects are involved. Guidelines on how to obtain permission to use human subjects in research are available from the departmental graduate coordinator or the executive secretary of the IRB, the Graduate College, or Office of the Vice-President for Research. The information provides examples of activities subject to careful review and those which are easily approved.

Because University policy requires prior approval of all research involving human subjects, the letter from the IRB granting approval of the research must be included in the appendix of any dissertation submitted to the Graduate College in fulfillment of degree objectives. Failure to obtain approval for use of human subjects means that the thesis or dissertation cannot be accepted.

Final 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. Following satisfactory completion of the final examination, the candidate will make any changes required by the committee and by the Graduate College and submit the dissertation in final form signed by the committee to the Graduate College.

Three copies of the dissertation in final form and six copies of the abstract must be submitted to the Graduate College no later than the stated deadline (see "Graduate College Calendar"). The 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 from their initial enrollment in the degree 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.

Any exception to these time limits must be approved by the Graduate Faculty Council.

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 Educational Studies

Curriculum and Instruction
Educational Administration
Higher Education
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. A student planning to seek the Doctor of Education degree must provide specific information as requested by the College of Education (i.e., vita, letters of recommendation, 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.

Temporary Adviser. At the beginning of a student's doctoral program, the head of the major department 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. 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 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 chairperson and committee. Before the conference the student must see that the chairperson 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 four copies approved and signed by the advisory committee. One copy will be retained by the student and three 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 dissertation credit. Forms for preparing the plan of study may be obtained in 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 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) pass a final examination, and (5) 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 the approval of his or her advisory committee, and have an approved outline for the dissertation on file in the Graduate College and in the office of the department concerned.

The qualifying examination is designed to measure the student's proficiency in the field of specialization, the breadth and depth of his or her professional education background and his or her knowledge of cognate subjects. The examination may be both written and oral but part of it must be written. This examination must be passed and the result reported to the Graduate College on Form G-4 at least six months before the degree is granted (see "Admission to Candidacy" in the "Doctor of Philosophy" section).

In case of failure to pass this examination, the student will be notified by the examining committee of the condition under which another examination may be taken. A student who fails on either the qualifying or final examination cannot take another examination for four months. If the result of the second examination is unsatisfactory, no other examination may be given without the approval of the Graduate Council.

Dissertation. A dissertation (doctoral thesis) is required of each candidate for the Doctor of Education degree. The dissertation has three principal functions: (1) training in research, (2) promoting professional growth, and (3) contributing to professional knowledge in education. Not every dissertation will be expected to serve these three functions in the same way or to the same extent.

The format specifications, procedures, and regulations for the dissertation are the same as for the Ph.D. The Ed.D. candidate should refer to the "Doctor of Philosophy" section on dissertations and submission procedures through the Graduate College.

Human Subjects and Research. Oklahoma State University follows federal guidelines which require a review of any research involving human subjects. All such research must be approved by the Institutional Review Board (IRB) before human subjects are involved. Guidelines on how to obtain permission to use human subjects in research are available from the departmental graduate coordinator or the executive secretary of the IRB, the Graduate College, or Office of the Vice-President for Research. The information provides examples of activities subject to careful review and those which are easily approved.

Because University policy requires prior approval of all research involving
human subjects, the letter from the IRB granting approval of the research must be included in the appendix of any thesis or dissertation submitted to the Graduate College in fulfillment of degree objectives. Failure to obtain approval for use of human subjects means that the thesis or dissertation cannot be accepted.

**Time Limit.** Students are expected to complete the requirements for the Doctor of Education degree within six years after beginning course work in the degree 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.

Any exception to these time limits must be approved by the Graduate Faculty Council.

**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 Program (Ed. S. )

**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.

**Admission to a Program.** A student planning to seek the Specialist in Education degree must provide specific information as requested by the College of Education (i.e., vita, letters of recommendation, 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.

**Temporary Adviser.** At the beginning of a student's Specialist in Education program, the head of the major department 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.** The dean of the Graduate College will appoint an advisory committee nominated by the head of the department in which he student wishes to specialize. This committee (1) conducts the preliminary examination and conference, (2) approves the proposed plan of study, (3) supervises the student's progress in the program, (4) supervises the research, and (5) arranges for and conducts the final examination.

**Plan of Study.** As soon as practicable after the appointment of the committee, the student will arrange with the chairperson 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 triplicate, in the Graduate College. This plan may be modified with the approval of the advisory committee and the dean of the Graduate College.

**Credit-hour Requirements.** A minimum of two academic years of full-time graduate study, or equivalent (a minimum of 60 semester credit hours beyond the baccalaureate degree), is required for the Specialist in Education degree. This may include as many as 10 credit hours for the practicum study and accompanying report.

**Character of Work.** Completing an appropriate number of courses with a "B" average (see "General Regulations") is only one of the requirements for this degree. The student must also: (1) pass a qualifying examination, (2) conduct an appropriate study of education, (3) show qualities of professional leadership, and (4) pass a final examination.

**Residence Requirements.** The candidate must be enrolled full-time in residence study for one academic year of the two years required for the degree. Two summer sessions are considered equivalent to one semester for purposes of meeting the residence requirement.

Ordinarily the last 20 hours, including the study and report, must be earned in residence on the Stillwater campus of Oklahoma State University. Any deviation must be recommended by the advisory committee and approved by the dean of the Graduate College.

**Qualifying Examination.** A qualifying examination is required for all candidates for the Specialist in Education degree. Conditions governing it are 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.
The four groups of the Graduate Faculty are full members and emeriti, and associate members and emeriti. Members of the Graduate Faculty, their degrees 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**

**BRUCE J. ACKERSON, B.S. (Univ. of Nebraska), M.S. (Univ. of Colorado), Ph.D. (ibid); Regents Professor of Physics; 1991, 1977.**

**BRIAN D. ADAM, B.S. (Wheaton College), M.S. (Univ. of Nebraska, Lincoln), Ph.D. (Univ. of Illinois); Associate Professor of Agricultural Economics; 1994, 1990.**

**LEE C. ADKINS, B.S. (Florida State Univ.), M.A. (Louisiana State Univ.), Ph.D. (ibid); Associate Professor of Economics and Legal Studies in Business; 1993, 1988.**

**ALAN C. ADOLPHSON, B.A. (Western Washington Univ.), Ph.D. (Princeton Univ.); Southwestern Bell Professor of Mathematics; 1987, 1983.**

**AMIN SALIM AHMED, B.S. (Cairo Univ.), M.S. (En-Shams Univ.), Ph.D. (Univ. of Oklahoma); P.E.; Professor of Civil and Environmental Engineering; 1990, 1980.**

**DOUGLAS B. AIACHE, B.A. (Univ. of Missouri), M.A. (ibid), Ed.D. (ibid); Regents Professor of Mathematics; 1980, 1969.**

**ZUHAIR F. AL-SHAIEB, B.S. (Damascus Univ.), M.S. (Univ. of Illinois), M.A. (Univ. of Rochester), Ph.D. (ibid); Associate Professor of English; 1990, 1985.**

**BRIAN D. ADAM, B.S. (Wheaton College), M.S. (Univ. of Arizona), Ph.D. (ibid); Professor of Curriculums and Instruction; 1985, 1986.**

**JOHN A. BANTLE, B.A. (Eastern Michigan Univ.), M.S. (ibid), Ph.D. (Ohio State Univ.); Professor of Zoology and Associate Dean for Research, College of Arts and Sciences; 1991, 1976.**

**BILLY J. BARFIELD, B.S. (Texas A & M Univ.), Ph.D. (ibid); P.E.; Professor and Head of the Department of Biosystems and Agricultural Engineering; 1992.**

**ROBERT W. BARKER, B.S. (Northeastern Oklahoma State Univ.), Ph.D. (O.S.U.); Professor of Entomology; 1991, 1976.**

**GERALD R. BASS, B.S.Ed. (Univ. of North Dakota), M.Ed. (ibid), Ed.D. (ibid); Associate Professor of Educational Administration and Higher Education; 1988, 1965.**

**RICHARD P. BATTEIGER, B.A. (Ohio Univ.), M.A. (Univ. of Florida), Ph.D. (ibid); Associate Professor of English; 1985.**

**KENNETH JOHN BELL, B.S. (Case Inst. of Technology), M.Ch.E. (Univ. of Delaware), Ph.D. (ibid); P.E.; Regents Professor of Chemical Engineering; 1977, 1961.**

**PATRICIA A. BELL, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Texas); Associate Professor and Head of the Department of Sociology; 1987, 1981.**

**CAROL L. BENDER, B.S. (Texas Tech Univ.), M.S. (Oregon State Univ.), Ph.D. (Univ. of California, Riverside); Associate Professor of Plant Pathology; 1991, 1986.**

**RICHARD C. BERBERET, B.A. (Carroll College), Ph.D. (Univ. of Nebraska); Professor of Entomology; 1980, 1971.**

**KENNETH DARRELL BERLIN, B.A. (North Central College, Illinois), Ph.D. (Univ. of Illinois); Regents Professor of Chemistry; 1971, 1960.**

**DANIEL J. BERNARDO, B.S. (Univ. of California, Davis), Ph.D. (Washington State Univ.); Professor of Agricultural Economics; 1993, 1985.**

**JOE G. BERRY, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Kansas State Univ.); Professor of Animal Science; 1988, 1980.**

**GARRY R. BICE, B.S. (Cornell Univ.), M.S. (ibid), Ph.D. (Ohio State Univ.); Professor of Occupational and Adult Education; 1990, 1985.**

**MICHAELE ABBE, B.A. (Brigham Young Univ.), Ph.D. (Iowa State Univ.); Professor of Economics and Legal Studies in Business; 1990, 1974.**

**LYNN K. ARNEY, B.S. (Univ. of Tulsa), M.E. (Northeastern Oklahoma State Univ.), Ed.D. (O.S.U.); Associate Professor of Educational Administration and Higher Education; 1988, 1985.**

**RICHARD ARTHUR AUERMAN, B.S. (Univ. of North Dakota), M.S. (ibid), Ph.D. (ibid); Professor of Management; 1987, 1980.**

**LINDA AUSTIN, B.A. (State Univ. of New York, Stony Brook), M.S. (Univ. of Illinois), M.A. (Univ. of Rochester), Ph.D. (ibid); Associate Professor of English; 1990, 1985.**

**CAROLYN JUNE BAUER BAIRD, B.S. (OSU.), M.S. (ibid), Ed.D. (ibid); Professor of Curriculum and Instruction; 1985, 1986.**

**DONALD L. BOSWELL, B.A. (Univ. of Central Florida), M.S. (Indiana State Univ.), Ph.D. (ibid); Associate Professor of Applied Behavioral Studies; 1991.**

**DONNA H. BRANSON, B.A. (Rosary College), M.S. (Univ. of Rhode Island), Ph.D. (Michigan State Univ.); Professor and Head of the Department of Design, Housing and Merchandising; 1987, 1983.**

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

**JAMES E. BREEZIL, B.S. (Univ. of Missouri), D.V.M. (ibid), Ph.D. (Univ. of Minnesota); Professor of Physiological Sciences; 1986, 1978.**

**GEORGE M. BRENNER, B.S., (Univ. of Kansas), M.S. (Baylor Univ.), Ph.D. (Univ. of Kansas); Professor of Pharmacology and Chairman of the Department of Pharmacology; 1980, 1976.**

**B. WADE BRORSEN, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Texas A & M Univ.); Professor of Agricultural Economics; 1992, 1991.**

**ANTHONY EDWARD BROWN, B.A. (Baylor Univ.), M.P.A. (Univ. of Tennessee), Ph.D. (ibid); Associate Professor of Political Science and Coordinator of Programs, University Center at Tulsa; 1988, 1980.**

**DONALD N. BROWN, B.A. (Harvard Univ.), M.A. (Univ. of Arizona), Ph.D. (ibid); Professor of Sociology; 1982, 1971.**

**ROBERT MILTON BROWN, B.A. (Univ. of Houston), M.A. (ibid), Ph.D. (Univ. of Maryland); Associate Professor of English and Director of Extension, College of Arts and Sciences; 1990.**

**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), B.S.M.E. (ibid), M.S. (Michigan State Univ.); Regents Professor of Biosystems and Agricultural Engineering; 1992, 1969.**

**David S. Buchanan, B.S. (North Dakota State Univ.), M.S. (Univ. of Nebraska), Ph.D. (ibid); Professor of Animal Science; 1986, 1980.**
174 Graduate Faculty


RICHARD W. EGGERMAN, B.A. (Baylor Univ.), M.S. (M.I.T.), Ph.D. (Iowa State Univ.); Professor of Chemical Engineering; 1993, 1966.

LEWIS H. EDWARDS, B.S. (O.S.U.), M.S. (Iowa State Univ.), Ph.D. (Univ. of Arkansas); Professor of Agricultural Economics; 1993, 1966.

MICHAEL R. EDGEMAN, B.S. (Washington State Univ.), M.S. (Michigan State Univ.), Ph.D. (Univ. of New York, Buffalo); Professor of Sociology; 1982, 1972.

ATTY J. ECHELLE, B.S. (Southeastern Louisiana State Univ.), M.S. (Univ. of Oklahoma), Ph.D. (Iowa State Univ.); Associate Professor of Veterinary Parasitology, Microbiology and Public Health; 1989, 1981.

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SIDNEY A. EWING, B.S.A. (Univ. of Georgia), M.S. (Univ. of Wisconsin), D.V.M. (Univ. of Georgia), Ph.D. (O.S.U.); Professor of Veterinary Parasitology, Microbiology and Public Health; 1979.

JAMES ROBERT FAIN, B.A. (Univ. of Texas), M.S. (Purdue Univ.), Ph.D. (Iowa State Univ.); Associate Professor of Zoology and Head of the Department of Veterinary Parasitology, Microbiology and Public Health; 1989, 1981.

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CLARK C. EDWARDS, B.S. (Purdue Univ.), M.S. (Iowa State Univ.), Ph.D. (North Dakota State Univ.); Professor of Agronomy; 1976, 1967.


RICHARD W. EGGERMAN, B.A. (Baylor Univ.), M.A. (Univ. of Illinois), Ph.D. (Iowa State Univ.); Professor of Philosophy; 1984, 1970.


CHARLES THOMAS HAAN, B.S. (Purdue Univ.), M.S. (Iowa State Univ.), Ph.D. (Iowa State Univ.); Professor of Agricultural Economics; 1992, 1982.

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JAMES THOMAS HAAN, B.S. (Purdue Univ.), M.S. (Iowa State Univ.), Ph.D. (Iowa State Univ.); Regents Professor of Environmental Science; 1992, 1987.

MARTIN T. HAGAN, B.S. (Univ. of Notre Dame), M.S. (Georgia Inst. of Tech), Ph.D. (Univ. of Kansas); Associate Professor of Electrical and Computer Engineering; 1996.

STEPHEN W. HALLGREN, B.S. (Univ. of Minnesota), M.S. (Ohio State Univ.), Ph.D. (Univ. of California, Berkeley); Associate Professor of Forestry; 1990, 1986.

LAWRENCE H. HAMMER, B.S. (Sam Houston College), Ph.D. (Brandeis Univ.); Associate Professor of English; 1989, 1984, 1979.

ALAN REED HARKER, B.S. (Univ. of Utah), M.S. (Iowa State Univ.), Ph.D. (Iowa State Univ.); Associate Professor of Biochemistry and Molecular Genetics; 1991, 1987.
ROBERT L. WESTERMAN, B.S., (O.S.U.), M.S., (ibid.), Ph.D. (Univ. of Illinois); Professor and Head of the Department of Agronomy, 1991, 1976.

PAUL ANTHONY WESTHAUS, B.S. (St. Louis Univ.), Ph.D. (Washington Univ.); Professor of Physics; 1976, 1968.

ROBERT PAUL WETTMAN, B.S. (Univ. of Connecticut), M.S. (Michigan State Univ.), Ph.D. (ibid.); Regents Professor of Animal Science; 1985, 1972.


JAMES D. WHITE, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Arkansas); Professor of Marketing; 1989, 1983.

JAMES PAUL WILDE, B.S. (Kansas State Teach.) M.A. (ibid), Ph.D. (ibid); Professor and Head of the Department of Aviation and Space Education; 1986, 1973.

JERRY LEO WILHM, B.S. (Kansas State Teach.ers College), M.A. (ibid), Ph.D. (ibid); Professor and Head of the Department of Geography; 1993, 1986.

KENNETH EDWARD WIGGINS, B.S. (Troy State Univ.), M.A. (Cal State Univ., Fullerton), Ph.D. (ibid); Professor of Psychology; 1993, 1986.

JOHN H. WILGUESS, B.S. (Indiana State Univ.), M.S. (ibid), Ph.D. (Univ. of Arkansas); Professor of Accounting; 1982, 1979.

JERRY LEO WILHM, B.S. (Kansas State Teachers College), M.A. (ibid), Ph.D. (ibid); Associate Professor of Applied Behavioral Studies; 1980, 1972.

KEITH D. WILLET, B.S. (Nebraska Wesleyan Univ.), M.S. (Univ. of Nebraska, Omaha), Ph.D. (Univ. of New Mexico); Professor of Economics and Legal Studies in Business; 1991, 1981.

JANICE E. WILLIAMS, B.S. (Frostburg State Univ.), M.P.A. (California State Univ.), Ph.D. (Univ. of California, Los Angeles); Associate Professor of Applied Behavioral Studies; 1993, 1988.

JOSEPH E. WILLIAMS, B.S. (New Mexico State Univ.), M.S. (ibid), Ph.D. (Iowa State Univ.); Professor of Agricultural Economics; 1980, 1975.

SUE E. WILLIAMS, B.S. (New Mexico State Univ.), M.A. (Iowa State Univ.), Ph.D. (O.S.U.); Associate Professor of Family Relations and Child Development, 1985, 1977.

TIMOTHY MICHAEL WILSON, B.S. (Univ. of Florida), Ph.D. (ibid.); Professor of Physics; 1982, 1969.

JOHN R. WINGENDER, B.A. (Univ. of Nebraska), M.A. (ibid), Ph.D. (ibid); Associate Professor of Finance; 1990, 1985.

ROBERT F. WITTWER, B.S. (State Univ. of New York), M.S. (ibid), Ph.D. (ibid); Associate Professor of Forestry; 1982.

HARRY S. WOHLERT, B.S. (O.S.U.), M.S. (Univ. of Oklahoma), Ed.D. (O.S.U.); Professor of Foreign Languages and Literatures; 1987, 1967.

JOHN E. WOLFE, B.A. (Bucknell Univ.), M.A. (Univ. of California), Ph.D. (ibid); Professor of Mathematics; 1991, 1974.


RUSSELL E. WRIGHT, B.S. (Iowa State Univ.), M.S. (ibid), Ph.D. (Univ. of Wisconsin); Professor and Head of the Department of Entomology; 1982, 1976.

JOHN H. WYCKOFF, III, B.S. (Univ. of Florida), Ph.D. (ibid), Associate Professor of Veterinary Parasitology, Microbiology and Public Health; 1991, 1986.

RADHA K. RAO YARLAGADDA, B.E. (Univ. of Myore), M.S. (South Dakota State Univ.), Ph.D. (Michigan State Univ.); Professor of Biological and Computer Engineering; 1990, 1966.


GARY E. YOUNG, B.S. (Univ. of California, Davis), M.S. (ibid), Ph.D. (Univ. of California, Berkeley); Professor of Mechanical and Aerospace Engineering; 1992, 1982.

CHANG-AN YU, B.S. (National Taiwan Univ.), M.S. (ibid), Ph.D. (Univ. of Illinois, Urbana); Regents Professor of Biochemistry and Molecular Biology; 1985, 1981.

LINDA YU, B.S. (National Taiwan Univ.), M.S. (ibid), Ph.D. (Univ. of Colorado); Adjunct Assistant Professor of Zoology; 1985.

WILLIAM G. ZIKMUND, B.A. (Univ. of Colorado), M.S. (Southern Illinois Univ.), D.B.A. (Univ. of Colorado); Professor of Marketing; 1980, 1972.

LARRY D. ZIRKLE, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Texas); Professor of Mechanical and Aerospace Engineering and Director of Student Academic Services, College of Engineering, Architecture and Technology; 1997, 1970.

FARREL J. ZVERNEK, B.S.C.E. (Univ. of Texas), M.S.C.E. (ibid), Ph.D. (ibid); Associate and Centennial Professor of Civil and Environmental Engineering; 1990, 1985.

**Full Members Emeriti**

DONALD CLAYTON ABBOTT, B.S. (Kansas State Univ.), M.S. (ibid), Ph.D. (ibid); Professor Emeritus of Biochemistry; 1986, 1954.


FREDERICK GENE ACUFF, B.A. (Manhattan Bible Coll.), M.S. (Kansas State Univ.), Ph.D. (Univ. of Missouri); Professor Emeritus of Sociology; 1988, 1962.


DONALD EMERSON ALLEN, B.S. (Ohio State Univ.), M.A. (ibid); Associate Professor Emeritus of Sociology; 1969, 1967.

WILTON T. ANDERSON, B.S. (Northwestern State College), M.C.E. (Univ. of Oklahoma), Ed.D. (Univ. of Colorado); Professor and Head Emeritus of the Department of Account ing; 1960.

DALE ELLSWORTH ARMSTRONG, B.A. (Centenary College), M.P.A. (Univ. of Texas), Ph.D. (ibid); Associate Professor Emeritus of Accounting; 1990, 1965.


JOHN THOMAS BALE, JR., B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Oklahoma); Regents Service Professor Emeritus of Administrative Services; 1993, 1967.

DONALD J. BANKS, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Georgia); Professor Emeritus of Agronomy; 1990, 1966.

HELEN FRANCIS BARBOUR, B.S. (Univ. of Oklahoma), M.H.Ec.Ed. (ibid), M.S. (Iowa State Univ.), Ph.D. (ibid); Professor Emeritus of Food, Nutrition and Institution Administration; 1974, 1960.


CALVIN GREENWOOD BEAMES, JR., B.A. (New Mexico Highlands Univ.), M.S. (ibid), Ph.D. (Univ. of Oklahoma); Professor Emeritus of Zoology; 1990, 1962.


LEO VERNON BLAKLEY, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Chicago); Professor Emeritus of Agricultural Economics; 1986, 1947.

Associate Members

LISA K. ABRAHAM, B.S. (Univ. of Bombay), M.S. (Iowa State Univ.), Ph.D. (Iowa State Univ.); Assistant Professor of Design, Housing and Merchandising; 1991.

CHARLES I. ABRAMSON, B.A. (Boston Univ.), M.A. (ibid), Ph.D. (ibid); Assistant Professor of Psychology; 1993.

SCOTT THOMAS ACTION, B.S. (Virginia Tech), M.S. (Univ. of Texas, Austin), Ph.D. (ibid); Assistant Professor of Electrical and Computer Engineering; 1994.

CHRISTOPHER MITCHEL ADAMS, B.A.S. (Univ. of California, Los Angeles), M.S. (Univ. of Wyoming), Ph.D. (Univ. of Nevada, Reno); Assistant Professor of Chemistry; 1987.

TROY ADAMS, B.S. (Brigham Young Univ.), M.S. (ibid); Assistant Professor of Health, Physical Education and Leisure; 1994.

DANNY M. ADKISON, B.A. (O.S.U.), M.A. (ibid), Ed.D. (ibid); Assistant Professor of Political Science; 1969, 1976.

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MARTHEL E. ALLEN, B.A. (Miami Univ.), M.A. (ibid); Associate Professor of Journalism and Broadcast and Manager of Educational Television Services; 1967.

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RAJA BASU, B.A. (Delhi Univ.), M.B.A. (Purdue Univ.), Ph.D. (Purdue Univ.); Assistant Professor of Management; 1991.

D. JACK BAYLES, B.S.M.E. (Univ. of Oklahoma), M.S.M.E. (ibid), Ph.D. (O.S.U.); Associate Professor in the School of Technology; 1979, 1974.

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.); Professor of Educational Administration and Higher Education and Vice-President for Student Services; 1980.

STEPHEN S. BELL, B.S.E.E. (Univ. of Wisconsin), M.S.E.E. (ibid), Ph.D. (ibid); Associate Professor of Engineering; 1991, 1988.


DENNIS EARL BERTHOLF, B.S. (Univ. of Kansas), M.A. (New Mexico State Univ.), Ph.D. (ibid); Professor of Mathematics; 1988, 1968.

JUANITA W. BICE, B.S. (Oklahoma Baptist Univ.), M.S. (O.S.U.), Ed.D. (Univ. of Tennessee); Adjunct Associate Professor of Occupational and Adult Education; 1983.

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; 1988, 1986.

JOHN PAUL BISCHOFF, B.A. (Maryland Co.), Ph.D. (Yale Univ.); Assistant Professor of History; 1984, 1976.

MARSHA C. BLACK, B.A. (Converse College), Ph.D. (Univ. of Tennessee); Assistant Professor of Zoology; 1990.

DARWIN R. BOARDMAN, B.S. (Texas Tech Univ.), M.S. (Ohio University), Ph.D. (Texas Tech Univ.); Assistant Professor of Geology; 1992.

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Associate Members Emeriti

MARIAN F. ABBOTT, B.M.E. (Central Methodist College), M.M. (Wichita State Univ.); Associate Professor Emeritus of Music; 1990, 1970. JOANNE L. AGNEW, B.A. (Queen's Univ.), M.A. (ibid); Ph.D. (Radcliffe College); Professor Emeritus of Mathematics; 1984, 1953.


JAMES E. BAKER, B.S. (U.S. Naval Academy), B.S.E.E. (O.S.U.), M.S.E.E. (ibid), Ph.D. (ibid); Professor Emeritus and Head Emeritus of the School of Electrical and Computer Engineering; 1985, 1961.

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FREDERICK M. BLACK, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Business Administration; 1979, 1953.

JOHN RICHARD BOSWORTH, B.A. (Univ. of Illinois), M.A. (ibid); Assistant Professor Emeritus of Philosophy; 1986, 1962.

WENDELL BOWERS, B.S. (Univ. of Illinois), M.S. (ibid); Professor Emeritus of Agricultural Education; 1985, 1953.


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MARGARET S. CALLSEN, B.A. (Concordia College), M.S. (Univ. of Wisconsin), Ph.D. (Kansas State Univ.); Associate Professor Emeritus of Family Relations and Child Development; 1993, 1973.

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PAULINE W. KOPECKY, B.B.A. (Southwestern)
WILLIAM L. JOHNSTON, B.S. (Illinois State)
FAYNE H. OBERST, D.V.M. (Kansas State)
ROY V. STURGEON, JR., B.S. (O.S.U.), M.S.

190 Graduate Faculty

JOHN EDWARD HOFFMAN, B.S. (Univ. of

GERALD KENNETH GOFF, B.A. (Phillips Univ.), GERTRUDE McALLISTER MEANS, B.A. (Park

HOOVER PAGE FISHER, B.M.E. (O.S.U.), M.S. College of Education);

RICHARD LEE CUMMINS, B.S. (Univ. of Illi-

GRAND STUDIES; ECONOMICS; PARASITOLOGY; AGRICULTURAL ENGINEERING;


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GEORGE W. A. MAHONEY, B.S. (Univ. of Illinois), M.S. (ibid), Ph.D. (ibid);

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GEORGE EARL COOK, B.S. (O.S.U.), M.S. (ibid); Associate Professor Emeritus of Agricultural Engineering; 1986, 1952.


RICHARD LEE CUMBINS, B.S. (Univ. of Illi-

PHILIP E. PAULIN, B.A. (Univ. of Kentucky), DAN WESLEY, B.A. (Berea College), M.S. (ibid), Ph.D. (ibid);

FRANCES L. STROMBERG, B.A. (O.S.U.), M.S. (ibid);

JOHN T. SMITH, B.S.Ed. (East Central College), Ph.D. (Univ. of Chicago), Professor Emeritus of Educational Administration and Higher Education; 1988, 1979.

WARREN E. TAYLOR, B.S. (O.S.U.), M.S. (ibid);

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

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.

Not all courses are offered each semester or session. Students should consult the current class schedule book and the departmental office for specific details regarding frequency of offerings in specific courses.

Course descriptions are 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 Requirement 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 boldface letters.

**Statement of Variable Credit.** Each course number ending in zero is followed by a statement of the credit that may be earned. Typical entries are 1-6 credits, maximum 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: A, B or C
  - A or B or C is acceptable
- Prerequisites: A, B and C
  - A and B and C are required
- Prerequisites: A, and B or C
  - A and either B or C
- Prerequisites: A and B, or C
  - Both A and B, or C is required
- Prerequisites: A, or B and C
  - Either A or both B and C is required
- Prerequisites: A or equivalent and B
  - Both A, or the equivalent of A, and B are required
- Prerequisites: A, and B or equivalent
  - Both A and B, or the equivalent of B, are required
- Prerequisites: A and B, or equivalents
  - Equivalents of both A and B are acceptable.

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

**Description of Course Content.** The content of the course and its major emphases are described. Courses which are taught under another name and number are indicated by the statement Same course as 0000. Credit may not be earned in both courses so cross-referenced.
<table>
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<th>Abbreviation</th>
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<td>Applied Behavioral Studies in Education</td>
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<td>Aerospace Studies</td>
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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 business decision-making; primary emphasis on recognition of the important tax consequences that attach to business transactions and the impact on business decision making.

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. Prerequisites: 2203 with a grade of ‘C’ or better and STAT 2023. Cost accumulation systems, allocating product costs, planning and controlling costs, standard costing, and profitability analysis.


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, maximum 6. Prerequisites: consent of instructor and 3203 and 3403. Special topics, projects and independent study in accounting.

4013 Advanced Federal Income Taxation. Prerequisite: 3013 with a grade of ‘B’ or better. Federal income tax law applicable to individuals, corporations, partnerships, trusts and estates, and other specialized topics.

4203 Topics in Management Accounting. Prerequisites: 2203 with grade of ‘C’ or better and MGMT 3223. Integrative course in cost and management accounting; use of accounting information for internal decision making.

4303 Non-business, Fiduciary and Institutional Accounting. Prerequisite: 3403 with grade of ‘C’ or better. Fund and governmental accounting, bankruptcies, receiverships, estates and trusts.

4403 Financial Accounting III. Prerequisite: 3403 with grade of ‘C’ or better. Consolidated statements and other financial accounting topics.

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

4503 Auditing. Prerequisite: 3403, 3603. Auditing theory, procedures and practices.

4713 International Accounting. Prerequisite: senior level standing. Present-day multinational accounting problems, including world-wide differences in financial reporting, efforts at harmonizing these differences, and planning and control in multinational enterprises.

5000 Thesis. 1-6 credits, maximum 6. For students writing reports and theses in accounting.

5013 Seminar in Tax Research. Prerequisite: 4013 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 income 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 laws applicable to the petroleum and other extractive industries.

5043 Seminar in Partnership Taxation. Prerequisite: 5013 or consent of instructor. Federal income tax laws applicable to partners and partnerships.

5053 Seminar in Corporate Taxation. Prerequisite: 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.

5110 Special Topics and Individual Work in Accounting. 1-10 credits. Prerequisite: consent of instructor. Individual work on special topics, projects or readings selected to acquaint students with significant accounting literature.

5113 Managerial Accounting. Prerequisite: 5103. Interpretation of accounting data in planning, controlling and decision making.

5133 Seminar in Oil and Gas Accounting. Financial accounting and reporting rules and practices in the petroleum industry.

5203 Seminar in Contemporary Accounting Theory I. Prerequisite: 3403. Origin and development of accounting and a critical study of modern accounting theory.

5303 Seminar in Contemporary Accounting Theory II. Prerequisite: 3403. Critical study of contemporary accounting theory.

5400 Practicum in Professional Accounting. 1-6 credits, maximum 6. Prerequisite: 30 semester credit hours of accounting. An accounting policy course studying auditing, tax, systems, internal and external reporting and international aspects of business cases.

5503 Advanced Auditing. Prerequisite: 4503. Emphasis on auditing aspects of EDP, use of statistical sampling techniques in connection with audits of financial data, filings with the SEC and other regulatory agencies and other public accounting related topics.

5603 Accounting-based Information Systems. Prerequisite: 18 credit hours of accounting including 4203. Concepts underlying the design and use of an effective accounting information system.

5803 Seminar in Cost-Managerial Accounting. Prerequisite: 18 credit hours of accounting. Intensive study of cost managerial accounting theory relating to problems of an advanced nature.

5902 Research Report. Prerequisite: consent of supervising professor and coordinator of graduate programs in accounting. Methods used in research and report writing in accounting. Independent investigation and writing of an acceptable report on a topic approved by the student’s supervising professor. Restricted to candidates seeking the M.S. in accounting degree and not available to students who have credit in 5000.

6000 Research and Thesis. 1-18 credits, maximum 36. Prerequisite: approval of advisory committee. For students working on the doctoral degree.

6110 Graduate Readings and Special Topics in Accounting. 1-3 credits, maximum 20. Prerequisite: consent of supervising professor and coordinator of graduate programs in accounting. Supervised reading of significant literature and study of special topics not covered in regularly scheduled accounting courses.

6703 Seminar in Accounting Research. Prerequisites: Doctoral student status and consent of coordinator of graduate programs in accounting. Theoretical literature and research methodology in accounting.

Aerospace Studies-Air Force (AEROS)

1111 The Air Force Today I. Lab 1. Doctrine, mission and organization of the United States Air Force through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.

1211 The Air Force Today II. Lab 1. Continuation of the doctrine, mission and organization of the United States Air Force through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.

2111 The Development of Air Power I. Lab 1. Growth and development of aerospace power through history beginning with first manned flights and continuing through World War II.

2211 The Development of Air Power II. Lab 1. Development and growth of aerospace power from the period following World War II through the Vietnam conflict; concepts of peaceful deployment of US air power.

3103 Air Force Leadership and Management I. Lab 1. The study of the fundamental leadership, management, and communication skills required of an Air Force junior officer. Basic managerial processes, management of forces in changing environments, organizational power, politics and managerial strategy and tactics.

3203 Air Force Leadership and Management II. Lab 1. The application of leadership, management, and communication skills required of an Air Force junior officer. The individual as a leader in the Air Force environment, individual motivational and behavioral processes, group dynamics, leader and management ethics, counseling and evaluating are discussed.
Agricultural Economics 195

3504 Summer Training Unit. Prerequisite: consent of PAS. Includes an opportunity for 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, flight orientation rides, and survival training.


4202 Applied Officer 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.

4554 Flight Instruction Program. Prerequisite: consent of PAS. Academic and flying phase. Flight characteristics, meteorology, navigation, FAA regulations and radio procedures.

Agricultural Communications (AGCOM)

4453 Communications in Agriculture. Fundamentals of newswriting and other communication methods; the role of the news media in agriculture and related fields. Same course as JB 4453.

Agricultural Economics (AGEC)

1114 (S)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. No general education credit for students also taking ECON 1113 or ECON 2013.

2103 Principles of Economics Applied to Agriculture. Prerequisite: 1114. Macroeconomic theories: national economic problems including inflation, unemployment, and monetary and fiscal policies and their impacts on agricultural industries and farms.

3100 Internship in Agricultural Economics. 1-6 credits, maximum 6. Prerequisite: approval of internship committee and adviser. Supervised work experience with approved public and private employers in agricultural economics including banks, farm credit services, agriculture chemical firms, Soil Conservation Service, congressional offices and other opportunities. Credit will not substitute for required courses. Graded on pass-fail basis.

3203 Agricultural Price Analysis. Prerequisites: 1114, 2213 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 (A)Quantitative Methods in Agricultural Economics. Course reviewed. Prerequisites: 1114, MATH 1513, and MSIS 2103, AG 2112 or equivalent. Indices, graphics, budgeting, discounting, basic statistical measures, use of microcomputers, and price analysis. Basic background methods for some courses involving analysis.

3303 (S)Agricultural Marketing. Prerequisites: 1114, MATH 1513. The agricultural marketing system, its importance to the economy and the role of the individual farm manager. Futures markets, hedging and the use of decision aids.

3313 Agribusiness Management. Prerequisites: 1114, ACCTG 2103. Managerial functions and applications to nonfarm agribusiness firms. Alternative forms of ownership and principles of agricultural cooperatives. Acquisition, organization and management of human, financial, and physical assets for nonfarm agribusiness firms.

3403 Agricultural Business Records and Analysis. Lab 2. Prerequisites: 3413 and ACCTG 2103. Financial accounts, production and statistical records and their practical application to the successful management of the farm or ranch and other agricultural businesses.

3413 Farm and Ranch Management I. Lab 2. Prerequisites: 1114, MATH 1513, and MSIS 2103, AG 2112 or equivalent. Production planning with budgeting, financial records and income tax management for the individual farm-ranch business.

3503 (S)Natural Resource Economics. Prerequisite: ECON 2103. Framework for analyzing natural resource management decisions. Applications of microeconomic theory to the management of soil, water and other resources, with special emphasis on the institutions having an impact on management opportunities. Supply of and demand for natural resources, resource allocation over time, rights of ownership, and public issues of taxation, police power and eminent domain.

3603 Agricultural Finance. Prerequisites: 3313 or 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.

3990 Special Problems in Agricultural Economics. 1-3 credits, maximum 6. Directed study of selected agricultural economics topics.

4313 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 Applied Agribusiness Management. Prerequisites: 3313 or 3413; 3603 or FIN 3113; 3303 or MKTG 3213; 4413 or BUSL 3213, ECON 3023 or 3113. Applications of modern decision theory in the uncertain operating environment of agricultural firms including cooperatives. Planning, organizing, implementing, coordinating, and controlling problems associated with establishing an agribusiness, achieving firm growth, and operating the firm through time. Partial budgeting, regression, linear programming, and simulation as used by managers to analyze the interaction of resources, prices, and production alternatives in determining the optimal business plan.


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, national trade policies and world market structures for agricultural products. Impacts of trade on the domestic agricultural sector and the role of trade in agricultural economics.

4403 Farm and Ranch Management II. Prerequisites: 3303 and MATH 1513. Production planning with linear programming and other tools and methods of planning under uncertainty; acquisition 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 (S)Environmental Economics and Resource Development. Prerequisite: 3503 or ECON 3113 or consent of instructor. Economic, social and political factors relating to conservation, natural resource development and environmental quality. Valuation of priced and non-priced natural and environmental resources. Analysis of environmental and natural resource policy and the role of public and private agencies in conservation and development.

4513 Farm Appraisal. Lab 2. Prerequisite: 3413. Estimating the market value of agricultural real estate using the three approaches to value. Determining the feasibility and profitability of land purchases.

4703 (S)American Agricultural Policy. Prerequisites: 1114 and upper-division standing. Economic characteristics and problems of agriculture, evolution and significance of programs and policies.

4723 (S)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. Individual seminar reports and group discussion of reports.

4990 Problems of Agricultural Economics. 1-6 credits, maximum 6. Open to students with consent of instructor only. Research on special problems in agricultural economics.
Agricultural Economics

5000 Thesis or Report in Agricultural Economics. 1-6 credits, maximum 6. For students working for a M.S. degree in agricultural economics. Independent research and thesis under the direction and supervision of a major professor.

5010 Professional Experience in Agricultural Economics. 1-6 credits, maximum 6. Prerequisites: approval of internship committee and advisor. Supervised professional experience with approved public and private employers in agricultural economics including banks, production credit associations, federal land banks, soil conservation services, and other agricultural related firms. Credit will not substitute for required courses. Designed for Master of Agriculture program.

5101 Research Methodology. The philosophical bases for research methods used in agricultural economics. Alternative research methods compared. Alternative approaches to planning, managing and performing research.

5103 Mathematical Economics. Prerequisites: differential calculus and ECON 3113. Mathematical tools necessary for formulation and application of economic theory and economic models.

5113 Applications of Mathematical Programming. The application of concepts and principles of existing linear and nonlinear programming techniques to agricultural problems.

5203 Advanced Agricultural Prices. Prerequisite: 5103, STAT 4043. Demand and price structures, price discovery, time series and agricultural price research methods.

5213 Econometric Methods. Prerequisites: 5103 and ECON 4213 or STAT 4043. Application of econometric techniques to agricultural economic problems, theory and estimation of structural economic parameters.

5303 Agricultural Market Policy and Organization. Marketing firm decisions; structure, conduct and performance of agricultural industries; inter-regional trade theory; and government policies that influence decisions.

5313 Food Distribution Systems. Analysis of market structure; operational and pricing efficiency; organizational and operational decision making in food distribution firms.

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


5603 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. Prerequisites: 4703 and 5103. Application of welfare criteria and economic analysis to agricultural and rural development problems and policies.

5713 Rural Regional Analysis. Prerequisite: 5103. Concepts of market and nonmarket based rural welfare; theories of regional growth as applied to rural areas; methodological and computational development of regional analysis including computable general equilibrium; analysis of policies and programs for improving welfare of rural population groups.

5723 Rural Development Planning. Economics of market based planning for developing and developed countries; methods of incentive planning with emphasis on agricultural and rural project analysis; methods of agricultural and rural sector incentive planning with emphasis on general equilibrium results.

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.

5990 Advanced Studies. 1-6 credits, maximum 6. Open to graduate students with consent of instructor only. Investigation in designated areas of agricultural economics.

6000 Research Problems. 1-15 credits, maximum 24. Open to students pursuing graduate study in agricultural economics beyond the requirements for a master’s degree. Independent research and thesis under the direction and supervision of a major professor.

6102 Teaching Practicum in Agricultural Economics. Lab 4. Prerequisites: two semesters of graduate study in agricultural economics. Philosophes of resident and nonresident teaching, general tasks performed, review, evaluation and lecture organization, preparation and presentation.

6103 Advanced Applications of Mathematical Programming. Prerequisites: 5103, 5113. General presentation of large sample econometric models and the simulation of dynamic agricultural economic models. Required use of the GAMS/MINOS optimization software package.


6213 Advanced Econometrics. Prerequisite: 5213 and MATH 3013. General presentation of large sample theory followed by applications to general linear models, general nonlinear models, simultaneous equation models, time series models, and probit 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, governmental regulation and policy, and bargaining in agricultural markets.

6400 Seminar in Farm Management and Production Economics. 1-6 credits, maximum 6. Prerequisite: 5403 or consent of instructor. Scientific research methodology applied to problems of resource efficiency.

6503 Advanced Production Economics. Prerequisite: 5403. Micro dynamic production economic 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 research.

6600 Agricultural Policy and Rural Resource Development Seminar. 1-2 credits, maximum 2. Frontier issues in agricultural 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 Leadership Skills for Agricultural Organizations. Identification of styles and roles of leadership; development of leadership techniques and skills required in working with organizations and youth groups; dynamics of group action, methods of resolving conflict, of communicating, of guiding, and of evaluating; ethical considerations for leaders.

3403 Programs and Personnel of the Cooperative Extension Service. Enabling legislation, program areas, teaching methods used, staffing patterns, funding 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 2. 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.
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 4200. Facets of the teaching-learning process including teaching methods, basic teaching skills, proper classroom management techniques and motivational techniques and ideas. Preparation for student teaching which is to be completed during the same semester.

5320* 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 4203. Full-time directed experience in an approved agricultural education department. Applications of methods and skills in agricultural education as related to selecting, adapting, utilizing, evaluating curriculum materials and experiences to meet educational goals and facilitate learning for individual students. Roles, responsibilities, interactions, of school personnel and parents. Study of professional education groups and organization and operation of school systems. Graded on a pass-fail basis.

4300 Agricultural Education Internship. 3-10 credits. maximum 10. Prerequisites: 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 educational agriculture. 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, foundation 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 indigenous programs of rural development and adult education.

4990 Seminar and Problems in Agricultural Education. 1-3 credits, maximum 6. Small group and/or individual study and research in problems relating to programs of occupational education in agriculture.

5000 Research and Seminar. 1-6 credits, maximum 6. Independent research and thesis under the direction and supervision of a major professor.

5100 Organizing Curriculum and Programs of Agricultural Education. 1-3 credits, maximum 6. Studies of student and community agricultural needs as bases for localizing, personalizing and utilizing a basic core curriculum and other components essential to effective local agricultural education programs.

5123* Adult Programs in Agricultural and Extension Education. Determining adult needs, priorities, participation in educational activities and adaption of new ideas and practices. Designing, organizing, conducting, and evaluating adult education programs in agricultural and extension education.

5300 Extension Teaching Methods. 1-3 credits, maximum 6. Teaching methods applicable to extension work, their interrelationships and relative effectiveness. Result demonstration, method demonstration, meetings, tours, field days and exhibits.

5500 Directing Programs of Supervised Experience. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Determining the supervised training needs and opportunities of individual students. Planning for supervision of agricultural education training programs and 4-H club projects. Analysis of training opportunities in production agriculture, agricultural businesses and individual career development.

5752 Guidance and Leadership Development of Agricultural Youth. Providing for guidance of youth into farming and agricultural occupations. Sponsoring and advising youth groups; developing leadership through the local FFA chapter, 4-H Club and other youth organizations and groups.

5820 History, Functions and Objectives of the Extension Service. 1.3 credits, maximum 6. History, legal status, objectives, educational philosophy, aims and objectives and functional responsibilities.

5823 Advanced Methods of Teaching Agriculture. Advanced concepts and methods relevant for both formal and informal presentations. Effects methods may have on individuals involved in the learning experience. Demonstrations of proficiency in use of various advanced methodologies, technologies and concepts.

5862 Curriculum Design and Methodology for Alternative Approaches in Agriculture. The methodology, development and utilization of curriculum for instructional programs focusing upon alternatives in agriculture and agricultural enterprises. Resources and components of curriculum for teaching about new and emerging occupations and careers in agriculture.

5940 Styles of Leadership for Agricultural Education. 1-3 credits, maximum 8. Study of what leadership is and how current leadership styles have an impact on the success of present day agricultural organizations. Utilization of extensive bank of videotapes of current leaders as reference base for study.

5980 Research Design in Occupational Education. 1-3 credits, maximum 6. Research tools as aids in decision making. Literature, logic, survey techniques, research design, statistics and the computer are emphasized. Studies in vocational and technical education are reviewed and proposals for graduate research papers prepared.

5990 Problems in Agricultural and Extension Education. 1-3 credits, maximum 8. Securing and analyzing data related to special problems or investigation in designated areas of agricultural education.

6000* Research in Agricultural Education. 1-16 credits, maximum 16. Prerequisite: approval of major adviser. Open to students pursuing graduate study beyond the requirements for a master’s degree. Independent research and thesis under the direction and supervision of a major professor.

6100 Developments in Agriculture and Extension Education. 1-3 credits, maximum 6. Developing trends in agricultural and extension education. Pending and anticipated organizational and structural changes and changing emphases in goals and objectives. Functional relationships with other agencies.

6120 Teaching Agriculture in Higher Education. 1-3 credits, maximum 6. The teaching-learning matrix functioning in both undergraduate and advanced study in the field of agriculture. Discriminate review and assessment of recently developed instructional methods and trends.

6200 County Extension Program Development. 1-3 credits, maximum 6. A systematic study and use of methods of developing county extension programs, giving attention to sources of essential basic information, determination of problems and needs of people, functions of lay people and the various groups of extension workers. Uses of committees, step-by-step procedures, coordinated county and state plans and characteristics of effective programs.

6220 Assessment and Evaluation of Educational Programs in Agriculture. 1-3 credits, maximum 6. Application of the accountability concept to educational programs. Instructional, extension and other educational programs are assessed and the systems approach used to revise current programs and re-direct effort.

Agriculture (AG)

1011 Orientation. Required of all freshmen in the College of Agricultural Sciences and Natural Resources. 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(A)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. Lab 2. Operation and capabilities of microcomputers in agricultural applications. Simple programming, data analysis, graphical display, spread sheets, word processing.

3010 Internships in Agriculture. 1-3 credits, maximum 12. Supervised internships with business, industrial and governmental agencies including cooperating veterinarians. Graded on pass-fail basis.

4010 Honors Seminar. 1-6 credits, maximum 6. Role of agriculture in society and adjustments to change in the economy.

Agronomy (AGRON)

1213 Crop Production. Soils and cropping practices necessary for future crop production systems. Production of modern crops and their management, as well as the adaptation of major agronomic crops to varying edaphic and climatic conditions. Importance of crop production to the producer and the consumer.

2102 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.
Agronomy 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 (N) Fundamentals of Soil Science. Lab 2. Prerequisite: CHEM 1215. Principal physical, chemical, and biological properties of the soil related to plant growth; soil testing and fertilizer usage; identification of soil types. Graded on a pass-fail basis.

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 (N) Range Management and Forage Production. Prerequisites: 1213, 2124, and MATH 1213. Pasture systems, livestock management and forage crop production for maximum economical production of introduced forage species.

3433 (N) 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. Prerequisite to sound land use planning and land management.

3554 (N) Plant Genetics. Lab 2. Prerequisites: BIOL 1304. Basic principles of heredity. Interrelationship between classical genetics and molecular genetics emphasized. Mendelian genetics, cytoplasmic inheritance, mutation, gene regulation and genetic engineering.

3781 Market Grain Technology. Lab 2. Prerequisite: 1213. Quality characteristics of grain for commercial and industrial markets; grain classifications, 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; principles of seed testing; laws and regulations governing the production, processing, handling and marketing of seed.

3893 (N) Soil Chemistry. Prerequisite: 2124. Soil chemical properties and processes that affect plant nutrition, nutrient cycling, and fate of environmental pollutants. Soil chemistry of agronomic and environmental topics that affect water quality and sustainable agriculture. Soil acidity, pesticide residues, irrigation water quality, and heavy metal bioavailability in soils treated with waste materials.

3913 (N) Principles of Range Management. Prerequisites: 1213 or BIOL 1304, and AGRON 2124. Characteristics of rangelands; range regions of the U.S.; range plant response to the environment; the range ecosystem; ecological basis of range management; manipulating range vegetation and processes needed to suit land use management; managing rangelands for wildlife and other values. Two Saturday field trips required.

4080 Agronomy Internship. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Internship must be at an approved agribusiness unit or other agency serving agronomic agriculture. Requires a final conference with on campus adviser and a written report. Graded on a pass-fail basis.

4113 Advanced Weed Science. Prerequisites: 3111 and 3112. Integrated approach for weed management. Weed life cycles and biology, weed crop interferences, herbicide families and their characteristics, and finally a systematic and integrated weed management system. Methods of conducting and interpreting research results in appropriate topics.

4123 Crop Physiology. Prerequisites: 1213 and BOT 3463. Application of basic physiological concepts of growth and cultural management and underlying crop production; environmental and genetic effects on growth of crop plants. Plant ecosystems at the community level relative to optimum yields and quality.

4210 Describing and Interpreting Soils. 1 credit, maximum 3. Lab 3. Prerequisite: 2124. Describe and classify soil properties in the field and interpret for suitable agriculture, urban, and other land uses.

4234 Soil Fertility and Management. Lab 2. Prerequisite: 2124. Soil fertility and use of fertilizer materials for conservation, maintenance, and improvement of soil productivity and to minimize environmental concerns.

4263 International Agriculture and Food Production. Improving the understanding of world food supply as affected by contemporary culture, policies, climate and geography. Institutional structures needed to promote rural development, and to increase agricultural production in developing countries.

4353 Plant Breeding. Prerequisites: 3554 or equivalent. Basic principles dealing with the improvement of plants through application of genetic principles.

4363 Environmental Soil Science. Prerequisite: BIOL 1304 and CHEM 1215. Presentations of soil processes and interpretation for natural resource management; land reclamation; identification of wetlands; soil and water damages; impact of fertilizer, pesticide and other agricultural chemicals on soil and water quality; water resources; long-term soil erosion and landscape formation; transformations of manure, sewage sludge and other organic by-products.


4470 Problems and Special Study. 1-3 credits, maximum 12. Prerequisite: consent of the instructor. Problems in agronomic crops which include range and turf, plant breeding and genetics, weed control, soil chemistry and fertility, soil physics, soil biology, soil conservation and soil morphology; spring travel course.

4483 Soil Biology. Prerequisite: 2124. Soil ecology of microorganisms, biological transformations, humus complex, pesticide decomposition, plant nutrient cycles, microflora of rhizosphere.

4571 Senior Seminar. Prerequisite: senior standing in agronomy. Career opportunities (talks and field trips); preparation of resumes and interviews. Graded on a pass-fail basis.

4673 Grain Crops. Lab 2. Prerequisite: 1213. Production, distribution, classification, utilization and improvement of the major cereal crops.

4683 (N) Physical Properties of Soils. Prerequisites: 2124 and PHYSCI 1114. Soil physical properties and processes, and their influence on plant growth.

4772 Oilseed, Pulse and Mucilage Crops. Prerequisite: 1213. Production, utilization and improvement of oilseed, pulse and mucilage crops with special emphasis on peanuts and soybeans.

4783 Cotton Production. Prerequisite: 1213. Production, utilization and improvement of cotton. Several other agronomic fiber crops briefly discussed.

4934 Range Ecology. Prerequisite: 3914. Ecological principles pertaining to rangelands with emphasis on soil, plant and animal relationships. Characteristics of major range ecosystems and range plants.

4954 Range Vegetation Management. Lab 3. Prerequisites: 3914, AG 2112. Methods of managing rangeland vegetation for optimum sustained production. Integrated application of grazing management, prescribed burning, herbicides, and mechanical, treatments. Field trips and reports in laboratory.


4973 Range and Ranch Planning. Lab 4. Prerequisite: 4954. ANS 3612. Inventory of ranch resources, survey and evaluation of ranch practices, and economic analysis. Development of a comprehensive range management plan. Managing range and ranch resources in a social context. Written and oral reports. Field trips required. Same course as ANS 4973.

4990 Special Topics in Range Management. 1-3 credits, maximum 3. Prerequisite: 15 hours of range management. Advanced topics and new developments in range management.

5000 Master’s Thesis. 1-6 credits, maximum total credits under Plan I, and 2 maximum total credits under Plan II. Prerequisite: consent of adviser in agronomy. Research planned, conducted and reported in consultation with a major professor.

5020 Graduate Seminar. 1 credit, maximum per semester 1 credit on M.S. program and 2 credits on a Ph.D. program required. Prerequisite: graduate standing. Philosophy of research, methods of research, or interpretation of research in agronomy.

5110 Problems in Agronomy. 1-4 credits, maximum 6. Prerequisite: consent of instructor. Supervised study of special problems and topics in crop and soil science not covered in other graduate courses in agronomy.
5112 Herbicide Fate in the Environment. Prerequisite: 4112. Processes involved in the behavior and fate of herbicides in air, soil, and water. Reaction, movement and dissipation of herbicides in soil.

5193 Spatial and Non-spatial Data Base Management of Natural Resources. Prerequisites: one course in statistics and programming experience. Methods of acquiring, managing and analyzing spatial and non-spatial data using database systems. Management of non-spatial data using relational database managers. Development of applications using these tools for evaluating and managing natural resources.

5224 Soil Chemical Processes and Impact on Environmental Quality. Lab 3. Prerequisites: 3893 and CHEM 2113 or CHEM 3324 or equivalent. A comprehensive study of chemical processes in soil systems that impact biogeochemical cycles and environmental quality. Modern theory of soil solution thermodynamics, kinetics of soil chemical processes, soil colloids chemistry, and soil geochemistry. Environmental soil science applications including environmental fate of toxic substances and remediation of contaminated soil.

Laboratory component provides hands-on experience with techniques used for soil chemical investigations and with chemical speciation computer models.

5230 Research. 1-6 credits, maximum 8 (not to exceed 4 credit hours of either crops or soils). Prerequisite: consent of a faculty member who will supervise the research.


5333 Advanced Soil Genesis and Classification. Lab 2. Prerequisite: 3433. Processes and factors of soil formation. Comparison of world soil morphology and classification systems.

5403 Physiological Action of Herbicides and Plant Growth Regulators. Prerequisite: BOT 3463. The mode of action, breakdown and movement of herbicides and plant growth regulators in plants and soils. Same course as BOT 5403.

5414 Plant Breeding Theory, Methods and Strategies. Prerequisite: 3554, 4533 and STAT 5013, or consent of instructor. Development and application of statistical and genetic principles to breeding methodology of self- and cross-polinated crops. Emphasis on selection methods pertinent to plant improvement; examination of philosophies and strategies employed in private and public plant breeding programs.

5433 Biotechnology in Plant Improvement. Prerequisites: 3554, 4533, and BIOL 3014 or consent of instructor. Use of emerging technologies in cell biology and molecular genetics to study and manipulate plants. Emphasis on genetic systems which influence productivity and end-product utilization. The integration of biotechnology in plant breeding programs and issues concerning the release of genetically engineered organisms into the environment.

5434 Advanced Genetics. Prerequisites: 3554 or equivalent; BIOCH 3543 or 3653. Concepts of eukaryotic genetics with emphasis on classical, molecular and quantitative genetics.

5452 Cytogenetics. Prerequisite: 5443 or concurrent enrollment in BOT 5232. Behavior of chromosomes, cellular organelles and cytoplasm in relation to genetic behavior.

5583 Soil Physics. Prerequisites: MATH 2265 or 2365, PHYS 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 Laboratory Methods of Soil, Plant and Environmental Analysis. Lab 3. Prerequisite: CHEM 2122, 3324 or equivalent. Theory, principles and techniques of laboratory methods used for chemical analysis of soil, plant material and environmental samples. Modern analytical methods used for soil testing of plant available nutrients, determination of environmental contaminants, and chemical characterization of soil. Operational theory of applicable instruments including atomic spectroscopic (ICP, AA, UV/VIS, XRF), chromatographic (GC, GC-MS, HPLC, LC), and potentiometric methods. Laboratory component hands-on experience with chemical methods.

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, range ecology, grazing management, and range analysis.

5813* Soil-Plant Relationships. Prerequisite: 4234 or equivalent. Essential nutrient reactions in soil theory and practice at research and management levels 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 4. Prerequisites: 4954, ANSI 3612. Detailed analysis of case studies of range and ranch management problems. Resource inventory, evaluation of ranch operations, and economic analysis. Integrated planning for representative ranch firms. Written and oral reports. Field trips required. No credit for students with credit in 4973.

5990 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.

6332 Soil Mineralogy and Crystallography. Prerequisite: 5613. Crystalline properties of soil materials and their determination by X-ray diffraction and X-ray fluorescence. Principles of crystallographic indexing of soil minerals, absorption of organic and inorganic chemicals from the environment and soil engineering applications.

6410 Topics in Plant Breeding and Genetics. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Selected topics in the statistical and experimental analysis of quantitative traits, evolutionary development of domesticated plants and animals, and techniques used in breeding crop plants.

6683 Advanced Soil Physics. Prerequisites: 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.

1223 Exploring the Science of Animal Agriculture. Lab 2. An introductory course describing the principles, methods, applications and value of biological research with farm animals. Course also offered for honors credit.


3002 Dairy Production. Lab 2. Prerequisites: 1124 and 2123. Basic requisites of nutrition as related to composition of milk produced: requirements of replacement animals; herd health problems peculiar to stresses of production; milking management and mammary health; and dairy breed programs related to herd management.
200 Animal Science
Special Topics in Animal Breeding. Lab 2. Prerequisite: STAT 4023. Methods used in large animal research including the selection of experimental material, record keeping, interpretation of results and a critical review of existing investigations.

5723 Advanced Animal Nutrition. Lab 2. Prerequisite: 3653. Physiological aspects of digestion and absorption; nutrient content of livestock feeds and methods of analysis; methods of determining nutrient value of feeds, nutritional energetics; nutrient requirements of different animals; and the application of current concepts in nutrition to formulation of rations and feeding program.

5742 Rumenology. Prerequisite: 3653 or equivalent. Physiology of development of the ruminant digestive tract; the nature of, and factors controlling, digestion and absorption from the tract to include the relative nature and roles of the rumen bacteria and protozoa.

5751 Rumenology Laboratory. Lab 3. Prerequisite: 5742 or concurrent enrollment. Demonstrations and practice of basic techniques used in nutritional and physiological research investigations with the ruminant animal including cannulations, passage measurement, microbiology and in vitro rumen fermentation.

5762 Carbohydrate and Lipid Nutrition. Prerequisite: BIOCH 5753. An in-depth study of the digestion, absorption and metabolism of carbohydrates and lipids as related to energy requirements, productive function, health and disease.

5772 Protein Nutrition. Prerequisite: BIOCH 5753. Nutritional, biochemical and clinical aspects of protein metabolism as it relates to nutritional status.

5782 Vitamin and Mineral Nutrition. Prerequisite: BIOCH 5753. Development of the concept of dietary essential minerals and vitamins. Individual minerals and vitamins discussed for animal species from the standpoint of chemical form, availability, requirements, biochemical systems, deficiencies and excesses, and estimation in foods and feed.

5923 Livestock Systems. Lab 2. Prerequisites: AG 2112 or consent of instructor. Application of computer, linear programming and simulation techniques in animal research and livestock production.

6000 Research and Thesis. 1-10 credits, maximum 30. Prerequisite: M.S. degree. Open only to students continuing beyond the level of the M.S. degree. Independent research, planned, conducted and reported in consultation with and under the direction of a major professor.

6003 Population Genetics. Prerequisites: 5303 or equivalent and STAT 4023. Population concept of genetics with emphasis on qualitative inherited traits and statistical techniques utilized in population genetics. Gene and genotypic frequencies, estimation of genetic parameters within a population and the forces which can alter the magnitude of these genetic parameters and inbreeding.

6010 Special Topics in Animal Breeding. 1-3 credits. Prerequisite: consent of instructor. Advanced topics and new developments in animal breeding and population genetics.

6110 Seminar. 1 credit. maximum 3. A critical analysis of the objectives and methods of research in the area of animal science. Review of the literature, written and oral reports and discussion on select topics.
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 completion of upper-division undergraduate student learning about leadership study 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 Student Development for Residential Assistants. Theories of student development. Topics include helping skills, community building, communication skills, and multicultural sensitivity. Application of theory to living groups.

3113 Psychological Foundations of Childhood. Prerequisite: PSYCH 1113. The child from conception to puberty with focus on educational implications of development in cognitive, affective and psychomotor domains.

3202 Education of Exceptional Learners. Learning characteristics, needs and problems of educating the exceptional learner in the public schools. Implications of the learning, environmental and cultural characteristics; planning and program assistance available for accommodating the exceptional learner in regular and special education programs; observation of exceptional learners.

3213 Psychology of Adolescence. Prerequisite: PSYCH 1113. The adolescent from pubescence to adulthood with focus on educational implications of development in cognitive, affective and psychomotor domain.

3240 Observation and Participation in Special Education. 1-3 credits, maximum 6. Lab 1-3. Supervised activities with various types of exceptional learners and the educational provisions for them. Graded on a pass-fail basis.

3413 Child and Adolescent Development. Prerequisite: PSYCH 1113. The person from conception through adolescence with focus on education implications of development in cognitive, affective, social, and physical domains.

3633 Assessment and Intervention for Exceptional Infants and Children-Birth to Age 6. Prerequisite: 3202. Assessment techniques and interventions on strategies appropriate for exceptional infants and young children. Basic theories of development and research supportive of various intervention strategies and assessment techniques.

4052 Measurement and Evaluation in the School. Prerequisite: full admission to Teacher Education. Construction and selection of classroom tests. Contrasts between criterion-referenced and norm-referenced measurement strategies. Grading techniques, rudiments of standardized test selection and score interpretation and the basic statistics used to summarize and analyze test results.

4063 Exploration of the Creative Experience. Prerequisite: senior standing. The creative experience in art (visual to performing), articulation (oratory to literature), thought (philosophy to psychology), business (practices to products), leisure (relaxation to recreation). Western and Eastern viewpoints. Personal creative development fostered by modeling and by investigation of proven techniques. A wide range of creative endeavor with an experiential approach. Future-oriented applications.

4223 Human Learning in Educational Psychology. Prerequisites: 3113, 3213 or 3413; an approved observation or field experience course, and for students pursuing teacher certification, full admission to Teacher Education required. Instructional psychology focusing on the study of teaching and learning theory as part of an instructional program to deal with individual, cultural, and environmental differences. Case studies and group discussion emphasizing motivation, planning, evaluation, classroom problems and management.

4453 Educational Diagnosis and Remediation. Prerequisites: 4052, MATH 2413 and CIED 3263. Provides skills in the application of standardized and informal assessment information for educational planning. Includes analysis of commonly used achievement, perceptual, motor and language tests and behavioral analysis techniques.

4513 Introduction to the Emotionally Disturbed. Prerequisite: 3202 or 5633. Characteristics, identification and teaching of the emotionally disturbed or behavior disordered student; a variety of theoretical approaches to the subject.


4613 Student Teaching in Special Education. 1-2 credits, maximum 12. Prerequisites: 3202 and full admission to Teacher Education. Supervised teaching experience in the area of special education in which the student is preparing to qualify for a teaching certificate. Graded on a pass-fail basis.

4643 Clinical Teaching Seminar. Lab 2. Prerequisites: 3202, 3633, 4653. A supervised clinical experience with special needs individuals. Practical application of skills in instructional techniques and approaches, writing and implementation of IEP’s and lesson plans, developing or selecting appropriate activities and materials.

4653 Education of the Mentally Retarded. Prerequisites: 3202 and PSYCH 4613. Education program needs and social-cultural environment of mentally retarded children, adolescents and adults.

4713 Individualizing Education Programs for Exceptional Individuals. Prerequisite: 3202. Techniques for teaching the mentally retarded individual from adolescence through adulthood.

4743 Student Evaluation and Guidance Services. For secondary school majors with emphasis on test design, use and grading practices and on the teacher role in testing, evaluation and guidance services.

4753 Techniques of Behavior Management and Counseling with Exceptional Individuals. Prerequisite: 3202. Techniques to develop and evaluate programs of behavior change for exceptional students including counseling with the exceptional individual and conferencing with professionals and parents.

5000 Master’s Thesis. 1-6 credits, maximum 6. Prerequisite: consent of instructor.

5013 Research Design and Methodology. Prerequisite: admission to a graduate program in education or consent of instructor. Required of all graduate students in education. An introduction to the concepts of research design, methodology, sampling techniques, internal and external validity and the scientific method in educational problem solving. Critical analysis of educational research studies and the writing of proposals. No credit for student with credit in 5015.

5015 Foundations of Educational Research. Introduction to research concepts in methodology, statistics and measurement necessary to research in education. Interpretation of descriptive statistics, introduction to inferential statistics, rudiments of educational research design and appropriate uses and characteristics of tests and measurements. Emphasis on the scientific method in educational problem solving. No credit for students with credit in 5013 and 5853.

5023 Introduction to School Psychological Service. Prerequisite: admission to school psychometry or school psychology program. History, role and function, and issues and problems of the school psychological service worker.

5042 Interviewing Techniques. Prerequisite: graduate standing or consent of instructor. Basic principles underlying effective interviewing and interpersonal communication skills. Overview of various types of interviews. Application and analysis of interviews through video and audio tapes.

5063 Introduction to Gifted and Talented Education. Concepts, techniques and strategies for providing differentiated educational programs and experiences for the gifted and talented. State and Federal legislation; development of gifts and talents: program types; identification systems; program development; materials development; teaching techniques and methodologies.

5103 Human Development in Psychology. Prerequisites: three hours in developmental psychology or consent of instructor. Introduction to basic research and theories of cognitive, emotional and social development. Applications to educational and family settings.

5123 Medical Information in Counseling. Prerequisite: graduate standing or consent of instructor. Orientation to medical information and medical aspects of disability. Application to clinical problems in human service professions such as rehabilitation counseling, counseling psychology, and related disciplines.
5163 Counseling Techniques for Teachers of Gifted and Talented Students. Prerequisites: 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.

5175 Gerontological Counseling. Prerequisite: graduate standing or consent of instructor. An examination of mental health treatment modalities and approaches to counseling with older adults. An experiential component is included.

5183 Introduction to Rehabilitation Counseling. Background, legal aspects and philosophy of rehabilitation. Overview of current practices in rehabilitation and related areas.

5213 Advanced Educational Psychology. Prerequisite: three hours of educational psychology or consent of instructor. Learning and its effect upon coping and adjustment. How learning, environmental and personality factors interact to change human behavior.

5223 Psychology of Disability. Psychological and sociological implications of physical disability and illness. Dynamics involved in adjusting to disabling conditions including issues in rehabilitation, psychology, counseling, and somatopsychology.

5230 Seminar in Applied Behavioral Studies. 3-6 credits, maximum 6. Prerequisite: consent of instructor. In-depth exploration of contemporary problems of applied behavioral studies.

5333 Effective Leadership in Student Services. Prerequisite: admission to graduate program in student personnel or consent of instructor. The organization and management of student services operations in postsecondary institutions. Models for policy and decision making as well as leadership and supervision issues.

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; philosophy; psychology; logic systems; problem solving; concept learning; creativity; creative dramatics, etc. Conceptual approaches to the use of the preceding in various interest-based and non-interest-based formats.

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, 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. An attempt to better meet the needs of children and youth.

5453 Vocational and Career Information. Prerequisites: 5553 or 5572. Local, state and national sources 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 potential counselor or student personnel administrator.

5483 Community Counseling and Resource Development. Prerequisite: 5473 and 5553 or consent of instructor. 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. Emphasis on effective communication skills in cross-cultural counseling or helping relationships and the integration of theoretical knowledge with experimental learning. Psychosocial factors, life styles, etc. of various cultural and ethnic groups and their influence on the helping relationship.

5510 Practicum in School Psychology. 2-6 credits, maximum 6. Prerequisite: admission to school psychometry or school psychology program. Supervised application of the principles and procedures of school psychology in institutions settings appropriate for the preparation of students in the areas of their specializations.

5512 Secondary School Counseling and Development. Cooperation of the school counselor, teachers, principals, and parents emphasized in organizing, developing, implementing, and evaluating a counseling and development program in secondary schools.

5520 Individual Appraisal. 3 credits, maximum 6. Methods of developing a framework for understanding individuals and techniques for data collection, assessment, and interpretation such as interviews, testing, and case study. The study of individual differences including ethnic, cultural, and gender factors.

5533 Developmental Interventions. Lab 2. Counseling theories and techniques for working with children, adolescents, and their parents in individual and group counseling and consulting. Laboratory portion translates theory to practice.

5543 Career Development Theories. Historical and contemporary viewpoints advanced by Ginsberg, Super, Holland, 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.

5572 Elementary School Counseling and Development. Cooperation of the school counselor, teachers, principals, and parents emphasized in organizing, developing, implementing, and evaluating a counseling and development program in elementary schools.

5583 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 Practicum in Elementary School Counseling. 1-8 credits, maximum 12. Prerequisites: grade of "B" or better in 5473 and 5553; admission to the counseling and student personnel program or consent of instructor. 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.

5620 Practicum with Exceptional Learners. 1-8 credits, maximum 8. Lab 1-8. Prerequisite: consent of instructor. Supervised individual and group experience with exceptional learners. The particular experience (learning disability, mental retardation, gifted, etc.) is determined by the student's field of specialization.

5623 Introduction to Learning Disabilities. Prerequisite: survey course in special education. Problems that students experience during their preschool, school and adult years; historical and contemporary perspectives; the cultural, environmental and psychophysiological contributions to earning style differences; and issues related to individualized educational planning and instruction. Practical experience with individuals having earning problems.

5633 Behavior Characteristics of Exceptional Individuals. Individual differences and problems that exceptional individuals experience. Educational programs and resources available to assist administrators, teachers and parents in dealing with unique individual needs.

5643 Counseling Parents of Exceptional Children. Aiding the classroom teacher and other professional personnel in the understanding of unique activities and interpersonal relations involved in counseling with parents of exceptional children.

5653 Play Therapy in Special Education. Theories and practices of the principles of play therapy. The application of play therapy for special education children. Supervised clinical experience with children with emotional, social and psychological problems.

5663 Creativity for Teachers. Theoretical origins of creativity and their concomitant applications in the learning environment. Blocks to creative thinking, imagination, imagery, creativity testing, developing ideas and innovations, creative problem solving and teaching techniques and methods to maximize creative potential in all kinds and types of students.
Rehabilitation Counseling Practicum. 1-12 credits, maximum 12. Prerequisites: graduate standing and consent of instructor. Applied experience for graduate students in counseling.

Developmental Language for the Exceptional Individual. Prerequisites: 3202 or 5633; 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.

Internship in Counseling. 1-12 credits, maximum 12. Prerequisites: grade of ‘B’ or better in 5590 and admission to the counseling and student personnel program. Supervised experience working and studying in a counseling agency or setting.

Methods of Teaching Students with Learning Disabilities. Prerequisites: 3202 or equivalent, 5623. Current techniques and approaches used to teach students with learning disabilities and the theoretical bases for these techniques and approaches. Adapting curriculum for use with learning disabled students. Professional roles of the teacher of learning disabled students including communications with other teachers.

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.

Workshop. 1-8 credits, maximum 15. Professional workshops of various topics and lengths. Each workshop designed to meet unique or special needs of individuals concerned with education, helping professions, and behavioral studies.

Seminar in Education. Prerequisite: consent of instructor. Preparation of seminar study.

Teaching Strategies for the Physically Handicapped. Prerequisite: 4613. Types of physical handicaps, their educational implications and various adjustments for optimal functioning.

Curriculum Modifications for Exceptional Individuals. Materials and resources designed for use by teachers and other professionals, para-professionals and parents in working with exceptional individuals. Includes commercial and teacher-student-made materials.

Psychoeducational Assessment of Preschoolers. Prerequisite: graduate standing. Relevant issues and challenges associated with the intellectual, social and behavioral assessment of preschool children, from the vantage point of recent research, discourse and policy initiatives. The link between assessment and intervention.

Teaching Methods and Techniques for the Gifted and Talented. Prerequisite: 5363. Subject and skill-related learning facilitation that is process-oriented and doing-centered. The role of the teacher as facilitator, counselor and non-directive change agent. Individualized educational plans, involving independent study, tutoring, correspondence, clustering, mentors, learning centers, resource centers.

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.

Characteristics and Identification of the Emotionally Disturbed Learner. Prerequisites: 4513 and PSYCH 3443. Characteristics and identification of the emotionally disturbed/behavior-disordered learner. The teacher's role in identifying the emotionally disturbed/behavior-disordered learner.

Advanced Methods for Teaching the Mentally Retarded. Prerequisite: 4653. A review of research and methodological developments related to the instruction of mentally retarded children, adolescents and adults.

Developing Programs for the Gifted and Talented. Prerequisites: 5063 and 5363. Programs based on various philosophies and structural concepts of gifted and talented education, e.g., mainstreaming, self-contained, pullouts, magnet schools, time blocking, acceleration and enrichment. Programs designed for general and specific academic ability; however, exposure will be provided to creative and productive thinking programs, leadership programs, and visual and performing arts programs. Specific models included.

Instructional Strategies and Resources for the Emotionally Disturbed Learner. Prerequisite: 5823. Instructional procedures and resources available for working with the emotionally disturbed/behavior-disordered learner. A wide range of theoretical approaches explored.

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.

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 services workers. Techniques include guided imagery, progressive relaxation and, especially, meditation.

Elementary Statistical Methods in Education. Elementary statistical methods needed by consumers of educational research. Descriptive and inferential statistics. No credit for students with credit in 5015.

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 sponsors. Developing community interest, finding external resources, external funding and resource information sources.

Identification and Behavior Characteristics of the Gifted and Talented. Prerequisites: 5733 and 5363. Cognitive, affective, and behavioral characteristics of the gifted and talented. Selection of tests and interest inventories. Selection and/or development of nomination/recommendation forms/models, inventories, checklists, rating scales, and other measures. Data abstraction from cumulative and anecdotal records. Functions of gifted/talented identification committees.

Doctoral Thesis. 1-25 credits, maximum 25. Prerequisite: permission of advisory committee chairperson. Required of all candidates for doctorate in applied behavioral studies. Credit given upon completion and acceptance of thesis.

Analyses of Variance. Prerequisite: admission to a doctoral level program or consent of instructor. A thorough examination of analysis of variance procedures as they relate to principles of experimental design in education and behavioral sciences.

Multiple Regression Analysis in Behavioral Studies. Prerequisite: 6003. Applications of multiple regression as a general data analysis strategy for experimental and non-experimental research in behavioral sciences.

Psychometric Theory. Prerequisites: admission to doctoral program, completion of 6013, or consent of instructor. Theoretical basis for applying psychometric concepts to educational and psychological measurement. The Classical True Score model and applications to instrument development and design of studies for evaluating instrument quality.

Doctoral Seminar in School Psychology. 3-6 credits, maximum 6. Prerequisites: admission to school psychology doctoral program. Research in school psychology in areas such as philosophy of science, major areas of emphasis, research design, ethical concerns, solving problems in schools, and publication. Scientific and professional ethics and standards of psychologists.

Adult Development. Theory and research concerning human development during the adult years. Practical applications for serving adult populations in education and education-related settings.

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.

Research Topics in Special Education. Prerequisites: 6003 and 6013, admission to doctoral program or consent of instructor. Classic and current significant research topics; review and reinforcement of professional inquiry skills in reading, utilizing, planning, conducting and reporting research in special education.

Principles of Counseling Psychology. Prerequisite: admission to the doctoral program in counseling psychology. Development, theoretical foundations and applications of therapeutic models of counseling and psychology.

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.

Child Personality Assessment. Prerequisite: admission to school psychology or counseling psychology program, or consent of instructor. The personal and social assessment of children using objective and projective techniques.
6123 Adult Personality Assessment. Prerequisite: consent of instructor. Administration and interpretation of adult personality assessment instruments such as Rorschach, TAT and DAP.

6153 Personality Theories. Prerequisite: consent of instructor. An in-depth analysis of personality theories and personality disorders.

6163 Emotion and Cognition. Prerequisite: consent of instructor. The relationship between emotion and cognition as it relates to knowing and learning. History, wisdom and the interdependence of affect and cognition, the effects of mood on memory, emotion in feminist epistemology, the role of feeling in the writing process, intuition, and narrative thought. Exploration of potential research.

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.

6183 Legal Aspects in Special Education. Prerequisite: admission to doctoral program or consent of instructor. Familiarization and analysis of legal rights and responsibilities of students, educators, and administrators in special education; federal and state mandates, case law and recent legal developments affecting special education.

6210 Internship in School Psychology. 3-6 credits, maximum 12. Prerequisite: 5510 or equivalent and admission to the school psychology program. Supervised field experience in the duties of a school psychologist consisting of one semester participation under the direction of a certified school psychologist or other qualified field personnel approved by the supervising faculty member.

6213 Higher Education Student Personnel Services. Prerequisite: 6173. Higher education student personnel services such as: admissions, orientation, student activities, financial aid, housing and counseling.

6220 Internship in Higher Education Student Personnel. 2-6 credits, maximum 6. Prerequisites: 6173 or 6213 and admission to the student personnel and guidance program and consent of supervisor. Provides work and study opportunities under supervision in areas of student housing, student activities, financial aid, foreign student advisement, student personnel administration, student union, group facilitation and other appropriate work situations.

6310 Advanced Practicum and Supervision. 3-12 credits, maximum 12. Prerequisite: 5590 and master's degree. For prospective counseling psychologists, counselor educators and supervisors, and practicing counselors. Supervised assistance in development of counseling, consulting and supervising competencies.

6313 Advanced Group Interventions. Lab 1. Prerequisite: 5563 or equivalent. Discussion and exploration of various aspects of group development and treatment. Theory and application of theory. Various factors associated with group psychotherapeutic cohesion, dynamics and screening.

6323 Psychological Consultation. Prerequisite: graduate standing in the applied behavioral studies or psychology program. Models and strategies for the delivery of special services in the schools and other agencies that focus on serving the mental health needs of children, adolescents and adults. The use of consultation as a problem solving alternative to the assessment/label approach.

6373 Program Evaluation. Prerequisite: admission to a doctoral level program or consent of instructor. Contexts, purposes and techniques of evaluating 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.

6443 Theories and Problems in Educational Psychology. Prerequisite: admission to doctoral program in educational, school psychology or consent of instructor. Theoretical foundations and nature of the problems studied in educational psychology; current issues and historical overview.

6460 Internship in Educational Psychology. 1-9 credits, maximum 9. Prerequisite: consent of instructor. Supervision and guidance of teaching and service in educational 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 planning and evaluation.

6533 Human Motivation. A theoretically-oriented approach to the concept of motivation; essential precursors to human behavior and applications to the solution of real and hypothetical problems.

6553 Advanced Practice in Marital and Family Treatment. Prerequisite: consent of instructor. Advanced methods in assessment, diagnosis and treatment of marital and family problems. Skill development, professionalism, ethics and case management. Dynamics of co-therapy and conjoint treatment. Case consultation format. Same as PSYCH 6553.

6560 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 development, and consent of instructor. Designed to facilitate counseling effectiveness and to set the stage for a productive life of professional practice.

6563 Program Development in Special Education. Prerequisite: 6373 and admission to doctoral program or consent of instructor. Physical, social and psychological factors in communities such as power structure, economics, prejudice, religion, as well as national activities that are influential in establishing programs for the exceptional.

6603 Current Trends and Issues in Special Education. Current research and literature regarding the education of exceptional children.

6613 Instructional Systems Design. Prerequisites: 5213 and consent of instructor. 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.

6663 Applied Multivariate Research in Behavioral Studies. Prerequisites: 6013 and admission to doctoral program. An overview and analysis of multivariate procedures commonly applied to educational and behavioral research. Emphasis on conceptual design and application of these procedures.

6850 Directed Reading. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Directed reading for students with advanced graduate standing.

6880 Internship in Education. 1-8 credits, maximum 8. Lab 3-24. Prerequisites: admission to advanced graduate program and consent of department head. Directed off-campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

Architecture (ARCH)


2003 (H)Architecture and Society. Design, planning and building considered in their social and aesthetic contexts.

2024 Statics and Strength of Materials. Lab 2. Prerequisites: grade of "C" or better in PHYSC 1114 or PHYSC 2014 and MATH 2145. Resultants of force systems, static equilibrium of rigid bodies and statics of structures. Shear and bending moments, deformation and displacements in deformable bodies.

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.

2216 Architectural Design Studio III. Lab 16. Prerequisite: grade of "C" or better in 2116. Problems in architectural design.

2263 Building Systems and Materials. Prerequisite: grade of "C" or better in 2116. Architectural, structural, environmental control systems and materials in architecture.


3083 (H)History and Theory of Baroque Architecture. Prerequisite: 2003. History and theory of rennaissance architecture in the western world particularly the later, baroque period.

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.

3116 Architectural Design Studio IV. Lab 16. Prerequisites: grade of "C" or better in 2216 and admission to third year. Problems in architectural design.
Environmental Control: Thermal Systems and Life Safety. Lab 2. Prerequisite: MATH 1715 or MATH 1513. A survey of the fundamentals of thermal comfort, energy concerns and mechanical systems for buildings as well as the basic principles of life safety.

Architectural Design Studio V. Lab 16. Prerequisite: grade of "C" or better in 3116. Problems in architectural design.

Structures: Timbers. Lab 2. Prerequisite: grade of "C" or better in 3323. Analysis and design of timber structures used in architecture.

Structures: Analysis I. Lab 2. Prerequisite: grade of "C" or better in 2024. Structural theory for applications in architecture.

Structures: Steel I. Lab 2. Prerequisite: grade of "C" or better in 2024. Analysis and design of steel structures used in architecture.

Environmental Control: Acoustics and Lighting. Prerequisite: MATH 1513 or 1715. A survey of architectural acoustics, electrical and lighting systems for buildings.

Advanced Architectural Acoustics Design. Prerequisite: 3433. The analysis and design of acoustically-critical spaces including open-plan offices, music facilities, studios, theaters, etc. The course includes a design project of the student's choice.

History and Theory of Early Modern Architecture. Prerequisite: 2003. History and theory of modern architecture as it developed in the western world from the industrial revolution to the early twenty century.


Architectural Design Studio VI. Lab 20. Prerequisite: grade of "C" or better in 3216. Problems in architectural design.

Structures: Concrete I. Lab 2. Prerequisite: grade of "C" or better in 3223. Analysis and design applications in architectural problems using concrete structures.

Structures: Steel II. Lab 2. Prerequisite: grade of "C" or better in 3323. Design and analysis of multi-story steel frames, trusses, arches and other architectural structure components.


Marketing Professional Services. Prerequisite: 3116. Business development aspects of design firm management, including: marketing plan development; marketing organization; strategies and tools; selling techniques and contract negotiating.

Architectural Design Studio VII. Lab 20. Prerequisite: grade of "C" or better in 4177. Problems in architectural design.

Structures: Foundations for Buildings. Prerequisite: 4123 or concurrent enrollment. Interaction of frames and supports for structures used in architecture. Subsurface conditions and design of foundation systems and retaining walls for buildings.

Field Study in Europe I. Prerequisite: senior standing in architecture or consent of instructor. On-site analysis and study of European architecture, culture and urban design.

Structures: Analysis II. Lab 2. Prerequisite: grade of "C" or better in 3243. Mathematical formulation of structural behavior. Matrix applications, finite element, finite differences, stability considerations and three-dimensional structural modeling.

Special Problems. 1-6 credits. Maximum 6 Lab. 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.

History and Theory of the Architecture of Frank Lloyd Wright and His Contemporaries. Prerequisite: 4073. A study of the architecture of Frank Lloyd Wright and his contemporaries in the late 19th and early 20th centuries.

History and Theory of Japanese Architecture. Prerequisite: admission to the professional school or consent of instructor. Historical Japanese architecture from 200 BC to 1980; Shinto, Buddhist, Zen Sukiya, Zukuri, Minka and contemporary subjects.

Special Topics. 3-6 credits, maximum 15. Subject to be selected by the graduate faculty in architecture to cover state-of-the-art advances.

Architectural Design and Development. Lab 24. Prerequisites: for architecture majors: grade of "C" or better in 3134, 3433, 4123, 4217; for architectural engineering majors: grade of "C" or better in 3116, 3134, 3433, 4123. Design and detailed development of a major architectural project integrating all aspects of architecture and related disciplines in a professional manner and milieu.


History and Theory of Architecture: Medieval. Prerequisite: 2003. Architecture of Western Europe from the Dark Ages to the beginning of the Renaissance including Romanesque and Gothic.

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.

Architectural Design Studio VIII. Lab 18. Prerequisite: grade of "C" or better in 5119 or consent of instructor. Problems in architectural design through national and international student design competitions.

Advanced Architectural Lighting Design. Prerequisite: 3433. Lighting applications in contemporary architectural design, including offices, schools, churches and health care facilities. Applications of the principles learned to a design of the student's choice.


Structures: Concrete II. Lab 2. 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 application.

Architectural Project Management. Prerequisite: fifth-year standing in architecture or consent of instructor. Principles of management as applied to architectural and architectural engineering projects.

Field Study in Europe II. Prerequisite: senior standing in architecture or consent of instructor. On-site analysis and study of European architecture, culture and urban design.

Special Problems. 1-15 credits, maximum 15. Lab 3-18. Prerequisite: consent of instructor and head of School. Theory, research or design investigation in specific areas of study in the field of architecture and its related disciplines. Plan of study determined jointly by student and graduate faculty.

Computer Applications in Architecture. Lab 3. Prerequisite: MECDT 4013 or equivalent or consent of instructor. State-of-the-art applications of computers to the practice of architecture and architectural engineering.

History and Theory of Non-Western Architecture. Prerequisite: graduate standing or consent of instructor. Architecture in the non-Western and pre-Columbian world.

History and Theory of Contemporary Architecture. Prerequisite: graduate standing or consent of instructor. American architecture beginning in the 16th century through the 20th century.

Special Topics. 3-6 credits, maximum 15. Subject selected by the graduate faculty in architecture to cover state-of-the-art advances.

Creative Component Research. Prerequisite: graduate standing or consent of instructor. Data gathering, analysis, and program formulation related to creative component.

Architectural Design Studio IX. Lab 20. Prerequisite: 5217. Problems in architectural design.

Architecture Seminar I. Seminar for graduate students only. Must be taken concurrently with 6117.

Financial Management for Architects and Engineers. Prerequisite: 3116. Financial aspects of design firm management, including fundamentals of finance, profit planning and control, cash management and analysis of financial statements.
2113  Life Drawing. Lab. 6. Prerequisite: 1113, 1203. Introduction to life drawing with emphasis on preliminary linear construction and structural aspects of the figure, including the study of general body proportions, rapid visualization and figure-ground relationships.

207  Creative Component in Architecture Engineering. Lab. 18. 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.

208  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 6206 with approval of adviser.

6244  Structures: Analysis III. Prerequisite: grade of "C" or better in 4444. Analysis techniques for architectural structures including stability, space frames, computer applications, gusseted towers and project research.

6283  Architecture Seminar II. Seminar for graduate students only. Architectural criticism.

6343  Structures: Steel III. Prerequisite: grade of "C" or better in 4144. Plastic analysis and design of structural steel frames utilizing load and resistance factor design.


6543  Structures: Concrete III. Prerequisite: grade of "C" or better in 5244. Design of prestressed concrete structures, including pre- and post-tensioning.

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 black and white and color media. The analysis and manipulation of form, light, space, volume, and the formal aspects of perspective.

1203  Design I. Lab. 6. An introduction to visual problem solving. Organization of the two-dimensional plane using the elements and principles of design: line, shape, value, texture and color. Use of black and white and color media.

1803  (H) 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.

2113  Life Drawing. Lab. 6. Prerequisite: 1113, 1203. Introduction to life drawing with emphasis on preliminary linear construction and structural aspects of the figure, including the study of general body proportions, rapid visualization and figure-ground relationships.

2203  Three-dimensional Design. Lab. 6. Prerequisites: 1103 and 1203. Exploration of three-dimensional form and space stressing organization of design elements, including the use of elements of design and their application to visual problem solving, distinctions between pigment and light and between additive and subtractive color mixing. The nature and properties of color, its expressive qualities, symbolic potential, and psychological impact.

3110  Life Drawing Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 2113. The development of formal and expressive aspects of drawing by direct observation of the figure and its environment. Emphasis on media experimentation, aesthetic considerations, personal concepts, and anatomy.

3123  Oil Painting. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213, or consent of instructor. The development of skills in oil painting stressing form and content, visual perception and individual expression. Technical instruction applicable to individual problems and needs.

3133  Watercolor Painting. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213, or consent 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-into-wet techniques, brush handling, paper supports and surface manipulation.

3232  Sculpture I. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213 or consent of instructor. Studies in clay and plaster. Subtractive and additive processes. Emphasis on sculptural ideas, methods and materials.

3330  Sculpture. 3 credits, maximum 9. Lab 6. Prerequisites: 1333 and 3303. Sculpture in any material.


3343  Jewelry and Metals. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213 or consent of instructor. The development of skills in the creative fabrication and forming methods of metal casting and metalworking. Cold joining, silver soldering, surface treatment and elementary stone setting. Applications toward either wearable or small scale sculptural format.

4030  Illustration. Lab. 6. Prerequisite: 3123 or 3133. 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.

4133  Lettering and Typography. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213. The study of symbolic communication including the practice of calligraphy, reproduction lettering, typographic and typographic design. Introduction of computer applications in type specification and layout design.

4343  Applied Graphic Design. Lab. 6. Prerequisite: 3423. Design problems with special attention to lettering, exhibition design, packaging, display, and point of purchase. Use of model-building tools and study of form and structure to introduce the student to problem-solving and finishing techniques. Development of concepts into models.

5303  Ceramics. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213 or consent of instructor. Methods of clay preparation, hand building, wheel forming methods, methods of decoration and glazing, firing and kiln construction. Involvement with ceramic materials and processes.

3603  (H) 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.

3613  (H) History of Medieval Art. 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.

3623  (H) 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.

3633  (H) 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 popularization of non-religious themes in painting, including portraits, landscape, still life, and genre.

3653  (H) History of 19th Century Art. Art of 19th century Europe-ideals, conflicts, escapes and triumphs, beginning with the French Revolution and ending in 1900.

3663  (H) History of American Art. Visual arts in America from the Colonial period to the present. Major styles, ideas and uses of material in architecture, painting, sculpture and design.


3700  Printmaking: Relief. Lab. 6. Prerequisites: 1103, 1113, 1203, 1803, 2203, 2213, or consent of instructor. Understanding and control of carving, processing and creating prints from wood, lino, screen and plastic. Development of images utilizing both traditional and contemporary approaches to relief printmaking.
3710 Printmaking: Screenprinting. 3 credits, maximum 9. Lab 6. Prerequisites: 1103, 1113, 1203, 1803, 2203 or consent of instructor. Understanding and control of stencil-making techniques and the printing of editions. Development of concepts and images through the medium of screenprinting.

3720 Printmaking: Intaglio. 3 credits, maximum 9. Lab 6. Prerequisites: 1103, 1113, 1203, 1803, 2203 or consent of instructor. Understanding and control of intaglio techniques; preparation, processing, and etching of images from metal plates. Development of concepts and images through traditional and contemporary approaches to the intaglio process.

3730 Printmaking: Lithography. 3 credits, maximum 9. Lab 6. Prerequisites: 1103, 1113, 1203, 1803, 2203 or consent of instructor. Understanding and control of the procedures of drawing, processing and printing editions from stones and metal plates. Development of concepts and images through the medium of lithography.

4100 Advanced Drawing. 3 credits, maximum 9. Lab 6. Prerequisite: 2113. Investigation of drawing stressing the development, abstract ideas, and individual imagery.

4120 Oil Painting Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3123. Oil painting with emphasis on personal development of visual ideas and technique.

4130 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.

4330 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.

4340 Jewelry and Metals Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3343 or consent of instructor. 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.

4413 Computer Graphics Design. Lab 6. Prerequisites: 3403, 3423. Utilization of computer software applications for the creation of electronic images and animation sequences that can be outputted to lasercopy, video or photographic slides. Emphasis on concept, thematic development and skilful presentation.

4420 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 interview techniques. Investigation of historic precedent in graphic design.

4430 Illustration Studio. 3 credits, maximum 9. Lab 6. Prerequisites: 3403, 3423. Developing and finishing illustrations for advertising, editorial, portorial, 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.

4500 Ceramics Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3503. Continued explorations of ceramic arts: glazes, clay bodies, methods of forming, decorating and firing. Continued emphasis on the relation between visual unity and individual expressive concepts as these apply to both utilitarian and conceptual forms.

4613 (H)Art Since 1945. Art and art theory from 1945 to the present. Major trends of abstract expressionism, pop art, minimalism, photocentrism and conceptual art. Theories and intellectual bases of each movement as well as major critical responses.

4633 (H,SpD)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.

4643 (H,SpD)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.

4800 Special Studies in Art. 1-3 credits, maximum 9. Prerequisites: junior standing and consent of instructor. Courses in media exploration, special subjects and current issues. Offered on campus or through extension workshops.

4900 Directed Study in Art. 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 graphic design. By contract only.

4910 Directed Study in Art History. 1-3 credits, maximum 9. Lab 1-6. Prerequisites: junior standing and written permission of department head. Self-designed special topics in art history. By contract only.

4933 Art in Context. Prerequisites: senior standing. Capstone course studying the role of visual arts in their historical, social and cultural context and in comparison to other disciplines of creative or performing arts, humanities and science.

4993 Senior Honors Project. 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 (A&S)

1100 An Introduction to the Arts. 1-3 credits, maximum 3. Prerequisites: participation in the Oklahoma Summer Arts Institute and consent of department head. Workshop experience in creative writing, dramatic performance, studio arts or music performance. Enrollment restricted to Oklahoma Summer Arts Institute participants.

1111 Freshman Orientation. Orientation for freshmen. Study techniques, evaluation of one's abilities and the making of proper educational and vocational choices.

1221 Honors Freshman Orientation. Prerequisite: Honors program participation. Orientation for freshmen to Arts and 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.

2000 Special Topics. 1-3 credits, maximum 6. Selected interdisciplinary topics presented in lecture or seminar format.

2123 Language of Art Appreciation. Appreciation of art, music; use of specific art offerings available on campus.

3003 Arts and Sciences Honors Supervised Research. Prerequisites: Honors program participation, consent of instructor and A S Honors program director. Introduction to research or other creative activity in student's major field through participation in professor's research or creative activities.

3603 Colloquium in Area Studies. Interdisciplinary studies in one area: African, Asian, Latin American, Russian and East European, Native American, Ancient and Medieval, or Women's studies. Individual undergraduate research projects.

3710 A S Internship. 1-6 credits, maximum 6. Prerequisite: junior standing. For students in the College of Arts and Sciences. Cooperative education experiences not included in departmental offerings. Before enrolling, students must have an individual contract approved by the sponsoring professor and the dean of Arts and Sciences (or administrative officer).

4000 Special Topics. 1-3 credits, maximum 6. Selected interdisciplinary topics presented in lecture or seminar format.

4110 Arts and Sciences Upper-division Honors Independent Study. 1-3 credit, maximum 3. Prerequisite: participation in the Arts and Sciences Honors program. Independent study by individual contract only. Before enrolling, student must have contract approved by the sponsoring professor and the director of Arts and Sciences Honors program.

4910 Research Problems in the Arts and Sciences. 1-3 credits, maximum 9. Prerequisites: consent of instructor. Directed readings and study for students wishing to pursue interdisciplinary topics of special interest in the arts and sciences.

4990 Honors Senior Thesis or Creative Activity. 1-3 credits, maximum 6. Undergraduate honors thesis, research and report, or other creative activity undertaken to satisfy the requirements for Departmental Honors in the College of Arts and Sciences. Restricted to Arts and Sciences Honors students.

5710 Developmental Workshop in Selected Academic Fields. 1-3 credits, maximum 9. Arts and Sciences discipline-based material. Study groups, lectures and seminars.

Astronomy (ASTRO)


2023 General Astronomy. Prerequisite: PHYS 1214 or equivalent. More rigorous treatment of material in 1104 for majors in physical sciences and other areas.

2153 Advanced Astronomy. Prerequisite: 1104 or 2023. Topics such as pulsars, quasars, neutron stars, black holes and interplanetary space probes.

3023 Astrophysics. Prerequisite: PHYS 2114 or consent of instructor. Astro 1104 recommended. Analysis and interpretation of astronomical phenomena in terms of the laws of physics; e.g. stellar structure, the interstellar medium, galaxies and cosmology.

3053 Celestial Mechanics. Prerequisite: MATH 2233. Motion of a particle under various laws of force, potential and attraction of massive bodies; theory of orbit determination and problems of two, three and N bodies.

Aviation and Space Education (AVSED)

1113 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.

1221 Primary Flight Laboratory I. Lab 2. Prerequisites: concurrent enrollment or completion of 1113; FAA Third-class Medical Certificate. Meets the flying requirements for the Private Pilot Certificate. Flight laboratory must be conducted by an OSU flight contractor. Special fee required. Graded on a pass-fail basis.

1222 Primary Flight Laboratory II. Lab 2. Prerequisites: 1113 and FM Third-class Medical Certificate. Meets the flying requirements for the final portion of the FAA requirements for the Private Pilot Certificate. Flight laboratory must be conducted by an OSU flight contractor. Special fee required. Graded on a pass-fail basis.

1403 Basic Aeronautics. A survey of the fundamentals of flight, history of aviation, and government regulations.

1503 History of Manned Space Flight. Significant historical concepts and events leading to the current status of space exploration.

2113 History of Aviation. History of aviation from its early developments to the present. Historic events and the role of government as they relate to the evolution of the regulatory infrastructure of the aviation industry.

2122 Secondary Flight. Lab 4. Prerequisite: 1220 or Private Pilot Certificate. First of three courses, 2122, 2132, and 2142, required for the Commercial Pilot Certificate. Maneuvers and cross-country flying. Requires 10 hours of dual and 50 hours of solo. Special fee required.

2132 Intermediate Flight. Lab 4. Prerequisites: 2122. Flight instruction in night flying, instrument, and cross-country flying. Use of radio navigation and flight computer. Requires minimum of 30 hours dual and 10 hours solo. Special fee required.


2203 Impact of Aviation and Space Exploration on Society. Survey of significant events and ideas and their economic and social impact on society.

2214 Theory of Instrument Flight. Prerequisite: 1113 or passed FAA Private Pilot Written Examination. Instrument flight rules, the air traffic system and procedures, and elements of forecasting weather trends. Preparation for FM Instrument Written examination. Flight simulator laboratory experience in an instrument flight environment.


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.


3243 Human Factors in Aviation. Prerequisite: PSYCH 1113 or equivalent. The study of people interacting with the aviation environment. Individual and group performance, equipment design, physical environment, and procedure development.

3333 Advanced Aircraft Systems. Prerequisites: 1113, 1220, 2122, 2313, or consent of instructor. Study of modern, complex aircraft systems: airframe, turbine 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.

3341 Multi-engine Flight. Lab 2. Prerequisite: Private Pilot Certificate. Dual flight training in preparation for the Multi-engine Flight Examination. The student must obtain the knowledge and skill necessary to add an Airplane, Multi-engine Land Class Rating to his or her private or commercial pilot certificate. Study of airplane systems, emergencies, single-engine flight and performance characteristics. Special fee required.

3441 Acrobatic Flight. Lab 2. Prerequisites: 1113 and 1220. A minimum of ten hours dual flight training. Basic, intermediate and advanced aerobatic flight maneuvers including sequencing and dimensional box spacing. Special fee required.

3443 Aviation Law. Prerequisite: BUSL 3213. Insight 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 a basic legal research capability.

3523 Airport Planning and Management. Prerequisite: 50 credit hours. Overview of the major functions of airport management including master planning, study of the socio-economic effects of airports on the communities they serve.

3553 General Aviation Management. Prerequisite: 50 credit hours. Functions of management in general aviation and airport operations including informal systems, experience, regulatory impact, physical facilities, flight operations, political forces and administration.

3663 Air Transportation: The Industry. Prerequisite: 50 credit hours. Broad understanding of the air transportation industry and an in-depth knowledge of the organizational structures, managerial functions and operational aspects of today’s major, national, and regional air carriers. Historical perspectives, regulations and associations, economic and social impact, physical facilities, flight operations, political forces and administration.

4100* Specialized Studies in Aviation. 1-3 credits, maximum 6. Prerequisites: junior or senior standing and 6 hours credit in AVSED courses. Independent studies, seminars, and training within selected areas of aviation.

4113* Aviation Safety. Prerequisite: senior standing or consent of instructor. Overview of flight safety including studies in human factors, weather, aircraft crashworthiness, accident investigation, and aviation safety programs. Students will be introduced to elements of aviation safety in ground and flight operations.


4200* Internship in Aviation. 1-4 credits, maximum 6. Prerequisites: junior or senior standing, consent of instructor. Individually supervised internships in aviation career areas. Directed field experiences related to the participants area of concentration. Graded on a pass-fail basis.
4213 Current Trends and Issues in Aviation. Prerequisite: 3663 and senior standing or consent of instructor. Analysis of current issues facing the various segments of the aviation industry. Specific areas include issues affecting the airline industry and general aviation. Application of previously learned concepts to case studies of practical problems to develop deeper understanding of the subject.

4241 Flight Instructor: Airplanes. Prerequisite: 4133 or concurrent enrollment. Dual flight training to meet the requirements for an FAA Flight Instructor Certificate with an Airplane Category Rating and a Single Engine Class Rating. Approximately 20 dual flight hours including maneuvers practice and practice instruction.

4303 Aviation Weather. Prerequisite: GEOG 3033 or equivalent. Familiarization with weather products available in aviation weather.


4703 Simulation in Aviation. Prerequisites: FAA Commercial and Multi-engine ratings. Preparation for the practical skills required for a career as a professional pilot. Skill areas comparable to those required for the FAA Airline Transport Pilot rating.


5729 Current Issues in Aerospace Education. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Current issues in aerospace education.

5813 Earth Observation Systems. Study of earth orbiting systems that collect data on the earth’s water, land and atmosphere.

5823 Space Science. A study of the solar system in relation to stars and galaxies.

5850 Directed Readings in Aerospace Education. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Directed studies in aerospace education.

5910 Practicum in Aerospace Education. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Directed observation and supervised clinical experiences in aerospace education.

6203 Aviation Physiology. Prerequisite: 5203 or equivalent. The study of the complexities of pilot performance as it relates to human physiology, human factors and aviation safety.

Biochemistry (BIOCH)

2344 Chemistry and Applications of Biomolecules. Lab 3. Prerequisite: CHEM 1225. A descriptive survey of organic functional groups and biomolecules. Mode of formation and function of these molecules in microorganisms, plants and animals as they relate to biotechnology, environmental sciences and health related issues. A terminal course for students in applied biological science education. Not recommended for professional students or students planning graduate study in biological sciences.

3653 Survey of Biochemistry. Prerequisite: CHEM 3015 or 3053. An introduction to the chemistry of living systems. Mode of formation, reactions and function of these compounds in microorganisms, plants and animals. No credit for students with credit in 3543.

3720 Biochemical Laboratory. 2-3 credits, maximum 3. Lab 3-6. Prerequisite: 3653 or concurrent enrollment. Qualitative and quantitative examination of biochemical materials and reactions. Available fall semesters for non-biochemistry, life science majors for two credit hours, that includes three lab hours per week. Available spring semesters for biochemistry majors for three credit hours, that includes six lab hours per week.

4113 Biochemistry. Prerequisite: 3653. An extension and expansion of 3653.

4224 Biophysical Chemistry. Prerequisites: CHEM 1515, MATH 2373. Classical and statistical thermodynamics, transport processes, electrochemistry, and kinetics, with emphasis on biological applications.

4990 Special Problems. 1-6 credits, maximum 10. Training in independent work, study of relevant literature and experimental investigation of an advanced problem.

5000 Research. 1-6 credits, maximum 6. For M.S. thesis.

5753 Biochemical Principles. Prerequisite: CHEM 3153 or equivalent. Chemistry of cellular constituents and biochemical processes in living systems. The first in a series of courses for graduate students in biochemistry and related fields.

5824 Biochemical Laboratory Methods. Lab 6. Prerequisites: 4113 or 5753 for concurrent enrollment in either, and CHEM 2113 and 2122, or 3324. Lecture and laboratory course in basic biochemical methods of separation and analysis, including chromatography, electrophoresis, centrifugation, use of radioisotopes, and molecular cloning.

5853 Metabolism. 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. 1-4 credits, maximum 10. Prerequisites: 5753, 5824 or concurrent registration, and consent of instructor. Lecture and laboratory course in advanced research techniques, designed to supplement 5824. In subsequent semesters, individual research problems pursued in laboratories of department faculty for six weeks and one credit hour each.

6000 Research. 1-15 credits, maximum 60. For Ph.D. dissertation.

6110 Seminar. 1-2 credits, maximum 2 for Ph.D. candidates or 1 for M.S. candidates. Prerequisite: 5853. Graded on pass-fail basis.

6742 Physical Biochemistry. Prerequisites: one semester of biochemistry, calculus and physical chemistry. Physical principles underlying molecular phenomena of biology and methods for their study. Besides core of topics, additional items may be chosen for individual or group study.

6763 Nucleic Acids and Protein Synthesis. Prerequisite: 4113 or 5753. Structure and biological function of nucleic acid containing structures with emphasis on recombinant DNA methodologies, information content, nucleic acid-protein interaction, regulation and rearrangement.

6773 Protein Structure and Enzyme Function. Prerequisite: 4113 or 5753. Theory of and methods for studying the physical and chemical basis of protein structure and function; and the enzyme catalysis, including kinetics, chemical modification and model studies. Examples from current literature.

6783 Biomembranes and Bioenergetics. Prerequisite: 5753 or consent of instructor. Components, organization and biosynthesis of plasma, mitochondria) and photosynthetic membranes, emphasizing structure-function relationships. Mechanism of metabolites, protons and electrons transport. Energy conservation in bioenergetic apparatus such as mitochondria, chloroplasts or bacterial chromatophores.
Biological Science (BIOL)

1114 (L,N) Introductory Biology: Populations and ecosystems. Lab 2. Ecological principles, populations, man and environment; genetics, reproduction and development; concepts of evolution, selection, adaptation, specialization and taxonomy. For the nonmajor.

1214 (L,N) Introductory Biology: Organisms. Lab 2. Cellular organization and function, energy relations, maintenance of living systems, coordination and behavior. For the nonmajor.

1304 (L,N) Principles of Biology. Lab 2. Prerequisite: high school chemistry or one semester of college chemistry. Principles of molecular, cellular, population, and community biology including biochemistry, genetics, evolution, ecology, and biological investigation. For majors in biological and related fields including the agricultural and health sciences.

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 importances to man of representatives of major groups. Evolution of systems and mechanisms which have allowed animals to survive and adapt to diverse habitats.

2220 Current Topics in Biology. 2 credits, maximum 15. Prerequisite: 1114 or 1304 or equivalent. Topics of current interest especially designed for nonbiology majors.

2283 Microbes and Society. Lab 2. Prerequisite: 1114 or 1304 or equivalent. Characteristics of bacteria and techniques used in their isolation, cultivation and identification. Soil sanitation, disease transmission and immunity. Water treatment and chemical and physical control of bacteria. For the nonbiology major.

3014 Cell and Molecular Biology. Lab 3. Prerequisites: 1403, or 1603, or equivalent; and organic chemistry. The cell concept and cell morphology, cell macromolecules, organelles, enzymes, energetics, movement of water and materials across membranes, effect 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 General Ecology. Lab 4. Prerequisite: 1403, 1603 or equivalent; MATH 1513 or 1715. Physical and biotic components of the environment, community ecology, natural ecosystems, and man's interaction with ecosystems.

3223 (N) Survey of Human Diseases. Prerequisite: 1114 or 1304 or equivalent. Types of diseases, such as metabolic, genetic, infectious. Human reproduction is dealt with in terms of anatomy, physiology, embryology, genetics and evolution. Birth control, and teratogenic substances as well as pregnancy and childbirth. For the nonbiology major.

3253 (N) Environment and Society. Prerequisite: 1114 or 1304 or equivalent. The impact of human activities and population growth on the natural world. Analysis of the potential of technological and societal changes to have an impact on the environment. For the nonbiology major.

3263 (N, Sp,D) Plants and People. Prerequisite: 1114 or 1304 or equivalent. Types of plants, form and function, history of uses of plants and plant products for food and beverages, fiber, medicinal purposes, and in people's surroundings. For the nonbiology major.

3272 (N) 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.

3604 Biological Principles for Teachers. Lab 2. Prerequisites: 1304, CHEM 1314, ZOOL 3204. Capstone course in biology for potential science teachers. Review of biological phenomena and principles as related to the curriculum.

4100 Problems and Special Study. 1-4 credits, maximum 4. Prerequisite: approval of instructor. Participation in research problems involving library, laboratory or field studies.

5100 Current Topics in Biology for Teachers. 1-4 credits. Prerequisite: 3213. Basic to diverse habitats.

Biosystems Engineering (BIOEN)

1012 Engineering Software. Lab 2. Prerequisite: ENGR 1311 (or concurrent enrollment); engineering major. Introduction to microcomputer software packages useful in engineering analysis and report preparation. Elementary CAD applications.

2022 Introduction to Engineering Design. Lab 4. Prerequisite: sophomore standing in the College of Engineering, Architecture and Technology. Implementation of creativity and the design process to solve engineering problems. Evaluation of the role and the integration of user considerations, specifications, materials selection, human and legal factors, economic factors, and feasibility in the design process.

3023 Instruments and Controls. Lab 2. Prerequisites: ENGR 1412, ENGS 2613. Transducers, signal conditioning, amplifiers, digital and analog control systems, control mechanisms, feedback systems, basic principles of computer-aided design and control systems. Assembly of laboratory test equipment for use in the classroom.

3113 Engineering Animal and Plant Environments. Prerequisites: BIOL 3233, PHYS 2114. Basic principles and practice of environmental control systems for animal and plant systems. Design and selection of equipment for environmental control of animal and plant systems.

3213 Machine Design. Lab 2. Prerequisites: 1012, 2022 and ENGR 2112. Function, design, operation and application of machine elements used in the design and application of plant production and storage.

3323 Soil and Water Resource Engineering. Prerequisite: ENGSC 3233. Engineering analysis applied to soil and water resources. Design principles and practice for engineering systems including pumping plants, irrigation and drainage systems, and erosion control.

3423 Physical Properties of Biological Materials. Lab 2. Prerequisites: BIOL 3113, BIOS 3213, and ENGS 2142 and 3233. Basic engineering fundamentals applied to characterization and determination of physical properties of biological materials. Physical characteristics; water relations; and rheological, thermal, aerodynamic, and electromagnetic properties of biological materials, including soils. Flow properties of non-Newtonian fluids and granular solids. Principles and techniques for measurement and determination of properties.

4001 Seminar. Prerequisite: senior standing. Preparation for professional practice through case studies about ethics, legal liability, safety, and societal issues. Practical professional communications experience.

4012 Senior Engineering Design Project I. Lab 6. Prerequisites: 2022; senior standing. First of two-semester sequence senior design courses. Student teams work on professional level design projects, using design procedures to develop specifications, propose alternative solutions, consider external constraints, develop drawings or plans, construct, test and evaluate designs.

4022 Senior Engineering Design Project II. Lab 6. Prerequisites: 2022, 4012. Second of two-semester sequence senior design courses.


4313 Hydrology I. Prerequisites: CHEM 1515. PHYS 2013, ENGSC 3233. Basic principles of surface and groundwater hydrology and their application in engineering problems. The hydraulic cycle, weather and hydrology, precipitation, evaporation, transpiration, surface waters, stream flow and groundwater, hydrologic and hydraulic stream routing, probability of hydrologic events, application of hydrologic models. Same course as GVEN 3843.
4400 Special Problems. 1-4 credits, maximum 4. Investigations in specialized areas of agricultural engineering.


5000 Thesis and Research. 1-6 credits, maximum 6. Prerequisite: consent of major professor.

5030 Engineering Practice. 1-12 credits, maximum 12. Prerequisite: B.S. degree in agricultural engineering. The identification, analysis and synthesis of an authentic problem in agricultural and biological engineering. Solution of the problem will involve making engineering decisions tempered by real-time restraints, economic realities, and limited data with due consideration for environmental and social implications.

5413 Instrumentation in Biological Process Control System. Prerequisite: 3023 or equivalent. Analysis of transducers 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.

5501 Seminar. Discussion of current literature with special emphasis on research and experimental techniques.

5513* Experimental Engineering Analysis. Prerequisite: STAT 4023. Design and analysis of engineering experiments, error sources and prediction equations using statistical theory.

6000 Research and Thesis. 1-10 credits, maximum 30. Prerequisite: approval by the student's advisory committee. Independent research and doctoral thesis preparation under the cognizance of a graduate faculty member in the student's field of specialization.

6313* Stochastic Methods in Hydrology. Prerequisites: 4313 or CIVEN 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 CIVEN 6843.

6323 Advanced Irrigation Engineering. Prerequisite: 3323 or equivalent. Hydraulic theory and design and operation of surface, sprinkler, and trickle irrigation systems. Management of water and energy in irrigated agriculture.

6333 Fluvial Hydraulics. Prerequisites: 3013 or equivalent. Principles of sediment detachment and transport in fluvial systems. Design of stable channels and flow resistance relationships for sediment-laden flows.


6503* Similitude in Research. Prerequisite: MATH 2233. 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. Problems associated with erosion control, drainage, flood protection and irrigation.

6540 Problems in Farm Power and Machinery. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Literature review and analytical studies of selected farm power and machinery problems. Written report required.

6580 Problems in Transport Processes. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Literature review and analysis of heat and mass transport and interval diffusion in biological materials at interfaces, thermal and cryogenic processing, drying, packed and fluidized bed systems. Thermal and moisture control processing affecting quality of food products. Written report required.

6600 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.

Botany (BOT)

3005 (N)Field Botany. Lab 6. Prerequisite: BIOL 1114 or 1304 or equivalent. Botanical field techniques, the vegetation of North America, and the flora of Oklahoma. Terminology of description, use of taxonomic keys, techniques of specimen preservation, field recognition of plant taxa and communities and controlling ecological factors, economic and wildlife significance of dominant taxa, principles of classification and nomenclature. Four weekend field trips required.

3013 Biological Microtechnique. Lab 3. Prerequisite: BIOL 1403 or 1603. Techniques for preparation of biological materials for microscopic examination. Same course as ZOOL 3013.

3024 Plant Diversity. Lab 4. Prerequisite: BIOL 1403. Forms and life histories of selected plants with emphasis on some of the less familiar forms. The diversity of plant forms as well as basic similarities in life histories; importance of each form to man and his environment. Field trips required.


3233 Plant Anatomy. Lab 3. Prerequisite: BIOL 1403. Structure of cells, tissues and organs of plants. Consideration of structure as related to ontogeny, phylogeny and function.

3460 Plant Physiology Laboratory. 1-2 credits, maximum 2. Lab 2-4. Prerequisite: 3463 or concurrent enrollment. Skills in techniques for working with plants, experiments involving nutrition, respiration, photosynthesis, water relations, translocation, growth and development. Students having credit in BIOL 3014 should enroll for one hour; all others enroll for 2 hours credit.

3463 Plant Physiology. Prerequisite: BIOL 1403. Plant subcellular structure, water relations, water absorption and ascent of sap, translocation, gas-eous exchange, nutrition, enzymes, respiration, photosynthesis, growth, development, reproduction, tropisms, hormones, dormancy and seed germination.

3693 (N)Plant Geography. Prerequisite: BIOL 1403. Discussion of the natural geography of the world's plants and the factors controlling it, especially environmental and biological, with emphasis on evolutionary trends and events.

4023 Community Ecology. Prerequisite: BIOL 3034 or equivalent. Plant and animal communities, community theory, the role of competition, predation, and demography in structuring plant and animal communities; succession, current controversies in ecology, with emphasis on the primary literature.

4374 Agrostology. Lab 4. Prerequisite: BIOL 1403. Grasses and the principles involved in their classification. Field trips required.

4400 Undergraduate Research. 1-2 credits, maximum 5. Prerequisite: consent of instructor. Undergraduate research problems in botany.

4993 Senior Honors Thesis. 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. An oral presentation made at a departmental seminar. Required for graduation with departmental honors in botany.

5000 Research. 1-6 credits, maximum 6. Research for the M.S. degree.

5104* Mycology. Lab 4. Prerequisite: graduate standing. A systematic study of the fungi, with emphasis on taxonomy, comparative morphology and fungal biology. Taught in the Department of Plant Pathology. Same course 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: BIOL 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.

5323 Cytogenetics Laboratory. Lab 4. Prerequisite: AGRON 5342 or concurrent enrollment. Cytogenetic research techniques, especially karyotyping; observation and interpretation of cytogenetic phenomena, classification, meiosis and chromosomal aberrations.

5314 Phylogeny and Classification of Flowering Plants. Lab 6. Prerequisite: 3114. Plant taxonomy and the relationship of various groups of vascular plants.
Physiological Action of Herbicides and Plant Growth Regulators. Prerequisite: 3463. The mode of action, breakdown and movement of herbicides and plant growth regulators in plants and soils. Same course as AGRON 5403.

Physiology of Ion Metabolism. Prerequisite: 3463 or equivalent. Physiology of ion absorption, translocation, metabolism and functions in higher plants.

Advanced Ecology. Lab 3. Prerequisite: 4023 or BIOL 3034. Physiological and evolutionary aspects of plant ecology as revealed by recent research. Spring recess field trip required.

Plant Ecological Genetics. Prerequisites: BIOL 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.

Physiology of Plant Growth and Development. Prerequisite: 3463 or equivalent. Molecular mechanisms of growth and development, subcellular organization and function, plant hormones, morphogenesis, germination and dormancy, senescence and abscission, plant rhythms. Application of physiological principles to agriculture.

Plant Tissue Culture. Lab 3. Prerequisite: 3463 or BIOL 3014. Skills in sterile technique, media preparation, embryogenesis and organogenesis. Survey of the major types of tissue culture and their application to crop and horticultural species. Introduction to general principles of genetic engineering of plant cells.

Plant Developmental Genetics. Prerequisites: 3463 or BIOL 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.

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.

Botany Seminar. 1 credit, maximum 6. Required of senior and graduate majors.

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)

Business Freshman Orientation. Prerequisite: freshman standing. Orientation for freshman 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.

Special Topics. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special topics and independent study in business.

International Business. Prerequisites: ECON 2013, FIN 3113, MGMT 3013, MKTG 3213. Development of international business strategy based on the integration of economic, accounting, financial, management and marketing concepts.

Business Projects. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special advanced topics, projects and independent study in business.

Business Colloquium. 3-9 credits, maximum 9. Prerequisites: junior standing and consent of the instructor and the dean. Study of an interdepartmental and interdisciplinary nature of various important issues and aspects of the business and economic environment. Provides an intellectual challenge for the able student with a strong interest in scholarship.

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.

Strategic Management and Business Policy. Prerequisites: senior standing and completion of common body core of the CBA. A terminal integrating course in formulating and implementing basic policy for business. Planning models, policy models and strategy development. Strategic decisions applied to practical examples of problems firms now face and of problems that they will face given current trends in the external environment.

Entrepreneurship and Venture Management. Prerequisite: admission to MBA program or consent of MBA director. Enterprise creation and problems faced by entrepreneurs in early growth stages of business ventures. An interdisciplinary problem-solving approach with emphasis on "live" case studies and plans for new business ventures. Emphasis is on entrepreneurship rather than problems faced by going concerns.

Selected Master of Business Administration Topics. 3-6 credits, maximum 6. Prerequisite: admission to the Master of Business Administration program. Selected topics dealing with business decision making and contemporary business issues.

Analysis of the Multinational Firm. Prerequisite: admission to MBA program or consent of MBA director. Identification and analysis of the managerial, financial and market problems facing the multinational firm. Focus is empirical, and stressing application of ecological and quantitative tools to the study of the multidimensional nature of the international business environment.

Research and Thesis. 1-9 credits, maximum 30. Prerequisite: approval of advisory committee.

Seminar in Business Administration. 3-6 credits, maximum 6. Prerequisite: consent of instructor. Interdisciplinary in nature; focused on research methodology.

Business Communications (B COMM)

Written Communication. Prerequisite: 50 semester credit hours. Analysis of business communication problems in terms of generally accepted communication principles. Practice in written messages; specifically, special goodwill letters, neutral and good-news, disappointing, persuasive and employment messages.

Organizational Communication. Prerequisite: 50 credit hours. Communication theory and processes; common and special problems associated with interpersonal and organizational communication affecting business decisions and operations. Principles and methods of basic and applied research in business and communication; practice in administrative report writing. Analysis of selected business cases.

Business Report Writing. Prerequisite: six hours of English. Fundamentals of writing business reports, including coverage of mechanics, content, and structure of business reports. Practice in writing business reports as well as oral presentations of reports.

Seminar in Administrative Communication. Understanding and application of valid and relevant communication principles and theories. Designed to develop management-level personnel who can effectively and efficiently use oral and written communications as administrative tools to organizational functioning.

Business Communication Applications. 1-3 credits, maximum 3. Application of communication techniques to the business setting. Interpersonal communication skills necessary for the manager in a business organization. Problems and applications within the modern business setting.

Business Education (BUSED)

Doctoral Thesis. 1-10 credits, maximum 10. Prerequisites: advanced graduate standing and approval of department head. Independent research for the doctoral thesis. Credit is given upon completion of the thesis.

Business Honors (BUHON)


Topics in Contemporary Business. Prerequisite: junior standing, admission to the Honors program. Topics of interest in the contemporary business and economic environment. The social role of the corporation; U.S. competitiveness and business and environmental issues.

Literature in Business. Prerequisites: junior standing, admission to the Honors program. Foundations of American business through selected literary masterpieces.
Business Law (BUSL)

1113
Law in Society. Forms and types of law and their evolution, including antitrust, ecology, consumerism and civil rights. Political, social and economic forces affecting legal developments. Legal needs of society and the probable future direction of the law.

3213
Legal and Regulatory Environment of Business. General concepts regarding the nature of the legal system, ethical issues in business decision making, dispute resolution processes, basic constitutional limitations on the power of government to regulate business activity, the nature of government regulation, fundamental principles of tort and contract law.

3223
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.

3423
State and Federal Regulation of the Employment Relationship. Prerequisite: 3213 or equivalent. Legal foundations of employment in the United States. Contemporary topics relating to the employment environment such as state legislative and judicial limitations on employment at will doctrine, federal legislation relating to equal employment opportunity and affirmative action, fair labor standards, safety in the workplace and state workers compensation laws.

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 relations 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.

4613
I. 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.

5163
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 selected substantive legal areas having a direct relationship with business operation and decision making.

Business Professions (BUSPR)

2313
Production Keyboarding. Lab 2. 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 and use of the microcomputer in text editing and other office information systems, and transcription of office communications.

3523
Office Problems in Keyboarding. Lab 2. Prerequisite: 2313 or equivalent. Problems in office situations requiring application of keyboarding knowledge and skills. Emphasis on quality work at high speeds.

3753
Executive Secretarial Transcription. Lab 2. Prerequisites: 2313 and 3523 (or concurrent enrollment in 3523). Transcription of executive-level dictation with exacting standards covering English usage, vocabulary, proofreading and accuracy and speed of transcription.

3863
Office Procedures. Prerequisite: 2630. Theory of and applied practice in performing secretarial and managerial operations. Human relations in business as well as decision-making and problem-solving.

4213
Computers and Multimedia for Workplace Education. Lab 2. Prerequisite: basic knowledge of MS-DOS or consent of instructor. Overview of MS-DOS microcomputer applications in workplace education, including selection of hardware and software, databases, spreadsheets, authoring systems, Internet and other on-line databases, and multimedia applications. Same course as OAES 4213.

4363
Teaching Bookkeeping and Accounting. Prerequisites: ABSED 3213, ACCTG 2203, skill in 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.

4473
Teaching Business Education Skill Courses. Prerequisite: full admission to Teacher Education. Instructional methods in the teaching of skill development courses, including classroom interaction patterns, instructional modification, and evaluation techniques.

4653
Data Processing Instructional Methods and Procedures. Prerequisite: MSIS 2103. 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. Hands-on programming experience integral part of course. Lab required.

4913
Instructional Strategies for Vocational Business Professions. Prerequisite: full admission to Teacher Education. Preparation, utilization, and interpretation of instructional and evaluation materials for vocational business education courses.

5000
Thesis. 1-6 credits, maximum 6. Prerequisite: consent of major adviser. Master's thesis.

5110
Problems in Business Professions. 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 investigations conducted in absentia and internships; periodic conferences and reports during the progress of the study.

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.

Cell and Molecular Biology (CLMOL)

3112
Cytology. Prerequisite: BIOL 1304 and BIOL 1403 or 1603; CHEM 1314 and 1515. Structures found within living cells, the dynamics of these structures and the functions which they perform.

3254
Immunology. Lab 1. Prerequisite: MICRO 2124. Vertebrate host's ability to defend itself against foreign intrusion. Chemistry and biology of the acquired immune response. Same course as MICRO 3254.

4123
Virology. Lab 4. Prerequisites: BIOL 3014 or one course in biochemistry and one upper-division microbiology course. Virus-host interactions including structure-function of animal, plant, and bacterial viruses. Discussion of the molecular basis of virus infection and development. Same course as MICRO 4123.

4246
Biotechnology. Lab 2. Prerequisites: BIOCH 3653 or BIOL 3014 or MICRO 4224 and MICRO 3133 and 4142 or consent of instructor. An in-depth exploration of the practical application of scientific principles. Classical and modern (genetic engineering) biotechnology, within a framework involving the identification of a problem or need, determination of a solution or product, strain development, scale-up technology, and product recovery or process enhancement. Same course as MICRO 4264.

4323
Bioenergetics. Prerequisites: BIOCH 3653 or BOT 3463, BIOL 3014. Bioenergetic reactions and mechanisms involved in energy production in plants, animals and microbial systems. Same course as MICRO 4323.

4990
Special Problems. 2-4 credits, maximum 8. Prerequisite: consent of instructor. Minor investigations in the field of cell and molecular biology.

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. Required for graduation with departmental honors in CLMOL.
Chemical Engineering (CHENG)

3013 Rate Operations I. Lab 3. Prerequisite: CHEM 1515. Application of mathematics and scientific principles to solving chemical engineering problems. Simple material and energy balances applied to process design. The nature and application of unit operations and unit processes to the development of chemical processes.

3013 Rate Operations II. Prerequisites: 3013, 3473. Continuation of CHENG 3013.


3473 Chemical Engineering Thermodynamics. Lab 3. Prerequisites: ENGSC 2213, concurrent enrollment in 2033 and CHEM 3434. Application of thermodynamics to chemical process calculations. Behavior of fluids, including estimation of properties by generalized methods. Study of chemical thermodynamics, including heats of reaction, chemical reaction and phase equilibria.

4002 Chemical Engineering Laboratory I. Lab 6. Prerequisites: 3013 and 3473. Applications of heat, mass, and momentum transfer, unit processes, and unit operations principles to the analysis of bench and pilot-scale equipment. Interpretation of experimental data and the presentation of results are emphasized.

4112 Chemical Engineering Laboratory II. Lab 6. Prerequisite: 4002. A continuation of 4002.

4124 Chemical Engineering Design I. Prerequisites: 3113, concurrent enrollment in 4002. Economic analysis of processes 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.

4224 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.


4363 Chemical Processes. Prerequisite: senior standing. Chemical process industries are studied from the standpoint of technology, raw materials, products and processing equipment. Thermodynamics and kinetics of industrial processes.

4473 Chemical Reaction Engineering. Lab 3. Prerequisite: senior standing. Principles of chemical kinetics rate concepts and data treatment. Elements of reactor design principles for homogeneous systems; introduction to heterogeneous systems.

458 Seminar. Prerequisite: senior standing. Recent developments in chemical engineering and the process industries.

4613 Fundamentals of Reservoir Engineering. Prerequisites: MATH 2233 and 3473 or MAE 3613. Introduction to problems of reservoir behavior and performance. Computer simulation of reservoir behavior.

4683 Petroleum Processes. Prerequisite: 3473. Analysis of the unit processes of petroleum refining.

4840 Process Control Laboratory. 2-5 credits, maximum 5. Lab 4-8. Prerequisites: 3013 and MATH 2233. Experimental study of control loop performance including tuning, feedback controllers, and control valves. Analog and digital techniques including: pneumatic and electronic components, programmable controllers, and computer simulation with color graphic displays.

4843 Chemical Process Instrumentation and Control. Prerequisites: 3013 and MATH 2233. Instruments for measuring temperature, pressure, composition and other process variables; different modes of control and their influence on process stability. Study of process analysis and design through linearization techniques.

4990 Special Problems. 1-5 credits, maximum 5. Lab 3-15. Prerequisite: senior standing. Training in independent work, study of relevant literature and experimental investigation of an assigned problem.

5000 Master’s Thesis. 1-6 credits, maximum 6. Prerequisite: approval of major professor. Methods used in research and thesis writing.

5030 Professional Practice. 2-6 credits, maximum 8. Prerequisites: senior standing and consent of instructor. Application of chemical engineering principles to the solution of real-life engineering problems in an actual or simulated industrial environment. Includes application of design and testing procedures, economic evaluation and reporting on one or more assigned projects.

5110 Special Topics in Chemical Engineering. Lab 2-6, 2-3 credits, maximum 6. Prerequisite: consent of instructor. Small group and individual projects in unit operations, unit processes, chemical kinetics, computer applications, process modeling or any of a wide range of chemical engineering topics. May be repeated for credit if subject matter varies.

5123 Advanced Chemical Reaction Engineering. Prerequisite: 4473. Advanced principles and applications of chemical kinetics in catalysis, heterogeneous systems, non-ideal reactions, polymerization and biological reactions.

5213 Selected 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.

5242 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.


5553 Metallurgical Failure Analysis. Prerequisite: ENGSC 3113 or equivalent. Mechanisms which cause materials failure. Instrumentation used for failure analysis. Case history study of representative failures. Laboratory analysis of failed samples.

5563 Corrosion Engineering. Prerequisite: ENGSC 3113. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service.


5743 Chemical Engineering Process Modeling. 3 credits, maximum 6. Chemical engineering 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.

5793 Advance-process Design and Economics. Prerequisites: 4123, 4223. Application of chemical engineering principles to the design and analysis of process equipment and plants; prediction and extrapolation of thermal and physical properties; methods for design and synthesis of process units and equipment.

Chemistry (CHEM)

1014
(LN)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.

1215
(LN)General Chemistry. Lab 2. Prerequisites: MATH 0123 or high school equivalent. The beginning chemistry course recommended for students who are not applied biological scientists. No credit for students with credit in 1014, 1314.

1225
(N)General Chemistry. Lab 2. Prerequisite: 1215 or advanced placement. A continuation of general chemistry, recommended for students in the applied biological sciences. No credit for students with credit in 1515.

1314
(LN)General Chemistry. Lab 2. Prerequisite: MATH 1513 or concurrent enrollment in 1613, 1715 or a higher level math course. The beginning chemistry course recommended for students in basic biological sciences (including pre-medical 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 1513 or 1715. Modern theories of solutions, separation techniques and methods of analysis. No credit for students with credit in 3324.

2122
Quantitative Analysis Laboratory. Lab 6. Prerequisite: 2113 or concurrent enrollment. Laboratory work related to material covered in CHEM 2113. No credit for students with credit in 3324.

2990
Special Problems in Chemistry for Non-majors. 1-2 credits, maximum 2. Prerequisite: 1515 or concurrent enrollment. Independent training in chemistry at the lower-division level.

3015
The Chemistry of Organic Compounds. Lab 4. Prerequisites: 1215 and 1225 or equivalent. Terminal, one-semester non-majors course in organic chemistry covering the general principles of nomenclature, structures, bonding, methods of preparation, reactions and uses of acyclic, cyclic, and aromatic compounds. No credit for students with credit in 3053 or 3112.

3053
Organic Chemistry. Prerequisite: 1515 or equivalent. Hydrocarbons and their derivatives, including specific compounds of theoretical, biological or industrial importance. No credit for students with credit in 3015.

3112
Organic Chemistry Laboratory. Lab 6. Prerequisite: 3153 or concurrent enrollment. Laboratory exercises related to theoretical principles covered in CHEM 3053 and 3153. No credit for students with credit in 3015.

3153
Organic Chemistry. Prerequisite: 3053. A continuation of 3053.

3164
Physical Science for Teachers. Lab 2. Prerequisites: 1314, GEOL 1114, PHYS 1114. Capstone course in physical science for potential science teachers. Review of physics and chemistry principles and phenomena as related to the curriculm.
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.

5223 Chemistry of High Polymers. Prerequisites: 3153 and 3434 or equivalent. Preparation and polymerization of organic monomers; properties and uses of resulting high polymers; theories of polymerization; inorganic and natural organic polymers.

5260 Inorganic Chemistry I. 1-3 credit hours, maximum 3. Prerequisite: 3353 or equivalent, and 3 hours of physical chemistry. Bonding theory, molecular symmetry and structure, characterization of inorganic compounds, coordination chemistry, crystal field theory, solution chemistry, and mechanisms of inorganic reactions in solution.

5323 Solid-state Chemistry. Prerequisite: 5260. Structure, bonding, and properties of crystalline and amorphous inorganic solids. Emphasis on the characterization of inorganic solids and phase transitions in inorganic solids.


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: 3553. 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, transference conductance, diffusion, dielectric constants and their theoretical interpretation.

5860 Inorganic Chemistry II. 1-3 credits, maximum 3. Prerequisite: 5260. Chemistry of main group and transition metal organometallic compounds, metal clusters, and catalysis by organometallic polymers, bioinorganic chemistry, and materials chemistry.

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 major professor.

6011 Advanced Seminar. Prerequisite: 5011 or M.S. degree. Preparation and oral presentation of critical reviews on chemical subjects. Usually related to the student's research area. Completion of 1 credit hour required for the Ph.D. degree.

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 modern 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; prediction of their course.

6323 Heterocyclic Compounds and Medicinal Chemistry. Prerequisite: 5362. Preparations and reactions of cyclic organic compounds containing atoms other than carbon in the ring. Modern synthetic techniques as well as industrial methods for the preparation of heterocycles, especially those with medicinal properties and uses as related to structural characteristics of the compounds.

6353 Chemistry of Natural Products. Prerequisite: 5323. Complex naturally occurring organic compounds such as alkaloids, terpenes and steroids.

6420 Speciation 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: 5653. 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.

Civil Engineering (CIVEN)

2613 Surveying I. Lab 3. Prerequisite: MATH 1613 or 1715. First course in a measurement science. Introduction and application of plane surveying procedures. Field problems related to linear and angular measurements, differential leveling, traverses and topographic surveys. Computer applications to surveying calculations.


3413 Structural Analysis. Lab 3. Prerequisite: 3113. Analysis of internal forces and deflections of structures subjected to static loading. Beams, trusses, and framed structures analyzed by appropriate classical methods. Classical methods and modern computer procedures for the analysis of statically indeterminate structures.

3513 Structural Steel Design. Lab 3. Prerequisite: 3113. Introduction to the design of structural steel members and connections in accordance with AISC specifications.

3523 Reinforced Concrete Design. Lab 3. Prerequisite: 3113. Introduction to the design of reinforced concrete elements in accordance with the strength design requirements of the ACI Building Code.


3614 Engineering Surveying. Lab 3. Prerequisite: MATH 1613 or MATH 1715. Principles and techniques of vertical and horizontal measurements related to engineering and construction projects. Linear and angular measurements, differential leveling, traverses, topographic surveys, construction surveying, horizontal and vertical curves, earthwork quantities, and design of route systems.

3623 Engineering Materials Laboratory. Lab 3. Basic construction materials including Portland cement concrete, asphalt concrete, aggregates, and composite materials. Behavioral characteristics, use, and quality control of these materials. Basic statistical procedures used for material specifications. Laboratory sessions provide "hands on" experience in performing standard tests.

3633 Transportation Engineering. Prerequisite: 3614 or consent of instructor. Planning, design and operations of transportation facilities. Vehicle characteristics and human factors in design. Traffic stream variables and their measurement techniques. Basic traffic flow models. Highway and street intersection capacity and level of service. Traffic control concepts. Transportation systems management. Application of statistical analysis and operations research to analyze transportation problems.

3713 Geotechnical Engineering. Prerequisite: 2112, 2142. Physical and mechanical properties of soils, including specific gravity, grain size distribution, plasticity, permeability, consolidation, and shear strength. Use of physical and mechanical properties to calculate stresses in a soil mass, lateral earth pressures, bearing capacity, and slope stability.

3813 Environmental Engineering Science. Prerequisites: CHEM 1515, MATH 2155. Engineering aspects of the life support system; the carbon-oxygen cycle; cycling of nitrogen, sulfur and phosphorus; and the hydrologic cycle. Concepts of environmental pollution and degradation. Techniques for mitigation; water and wastewater treatment, solid and hazardous waste management, and air pollution abatement. Calculation of pollution potential and treatment system parameters.


3823 Human Impact on the Environment. The activities of humans and how they affect the aqueous, terrestrial and atmospheric environment.

3833 Hydraulics. Prerequisites: CHEM 1515, PHYS 3313. Basic principles of fluid mechanics and their applications in civil engineering problems. Fundamentals of fluid and gas mechanics, properties of fluid, fluid statics, and fluid dynamics.

4763 Construction Estimating. Lab 2. Prerequisite: senior standing. The construction industry, its organization, its operation, estimating and bidding procedures. Theory and practice of estimating materials, labor, equipment and overhead costs for various types of construction. Emphasis on preliminary cost estimates during the conceptual design phase of a construction project.

4833 Unit Operations in Environmental Engineering. Prerequisites: 3813 and 3833. Basic theory of chemical, physical and biological processes used in the design and operation of environmental treatment systems. Application of treatment system design parameters based on theory.

5000 Master's Thesis or Report. 1-6 credits, maximum 6. Prerequisite: graduate standing. A student studying for a master's degree will enroll in this course for 2 credit hours if a report is to be written; 6 credits if a thesis is to be written.

5010 Civil Engineering Seminar. 1-3 credits, maximum 6. Prerequisites: graduate standing and approval of major professor. Review of literature of major fields of civil engineering.

5013 Aquatic Chemistry. Prerequisite: 5813 or concurrent enrollment, CHEM 1515 or equivalent. Application of chemical principles to environmental problems. Chemical kinetics, chemical equilibria, acid-base chemistry, and development of p-pH diagrams and coordination chemistry. Precipitation and dissolution reactions and oxidation-reduction reactions.

5020 Civil Engineering Research. 1-6 credits, maximum 6. Prerequisites: graduate standing and approval of major professor. Research and investigations other than thesis studies.

5029 Construction Contracts and Specifications. 1-6 credits, maximum 6. Prerequisites: graduate standing or consent of instructor. Topics of management, administration 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.

5042 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.

5043 Senior Design. Prerequisites: 3513, 3523, senior standing. Major comprehensive design experiences using the team approach. Industry practitioners provide design projects and analyze and critique results. Emphasizes personal experience and provides the student with opportunities to analyze and design complex structures.

5193 Environmental Engineering Design. Prerequisites: 3813, 3853, 4833, ENGSCE 3233. Factors involved in the design of engineered environmental systems. Solving "real-world" environmental engineering problems. Design experience using decision making techniques, integrating and expanding upon current knowledge, and defending engineering decisions made. Economic, environmental, social and regulatory aspects of environmental engineering design.

2473 Construction Planning and Scheduling. Lab 3. Prerequisites: senior standing and consent of instructor. Critical-path methods of planning, scheduling and controlling construction projects. Includes both computer and noncomputer techniques.

4711 Basic Soils Testing Laboratory. Lab 3. Prerequisite: 3713. Laboratory measurements of the physical and mechanical properties of soils: specific gravity, grain size distribution, plasticity, compaction, compressibility, and shear strength.

5143 Project Engineering and Management. Prerequisite: graduate standing or consent of instructor. Management of the design and construction of civil engineering projects. Topics include owner's study, formulation of project teams, design coordination, construction, and project closeout.

5153 Contract Administration. Prerequisite: graduate standing or consent of instructor. Methods and techniques of tracking and control of construction projects. Evaluation of current research findings to contract implementation.

5163 Construction Equipment Management. Prerequisite: graduate standing or consent of instructor. Analysis of construction equipment. Performance under various operating conditions. Application of engineering fundamentals to construction methods. Selection and costs of equipment, prediction of equipment production rates, and unit costs of work in place.

5173 Concrete Construction. Prerequisite: graduate standing or consent of instructor. Design of formwork for concrete structures. Analysis of loads, deflections, and stresses of forming systems. Evaluation of economics of formwork designs.

5213 Environmental Geotechnology. Prerequisite: background in soil mechanics and basic chemistry. A study of the ability of soil to retain pollutants, effect of pollutants on chemical, physical and geotechnical properties of soil. Description of soil remediation technologies.

5233 Geotechnical Engineering Investigations. Prerequisites: 3713, 4711, and basic geology course. Description of methods of subsurface explorations and in situ testing. Discussion includes a review of engineering geophysical methods, equipment and methods for boring and sampling of soil and rock, measurement of ground water conditions, and in situ testing equipment and methods such as cone penetration test, pressure meter test and others.

5243 Use and Design of Geosynthetics. Prerequisites: 3713, 4711. Description of types of geosynthetics available for engineering uses. Pertinent engineering properties required to design for various functions, basic design methodology for geosynthetics for various functions, and construction and performance considerations.

5263 Terrain Analysis. Prerequisites: Basic courses in soil mechanics and geology. Prediction of geotechnical engineering characteristics of geological landforms from remote sensing imagery. Emphasis on photographic stereo interpretation. Training and practice of this media in land-use applications and environmental problems.

5303 Systems Analysis for Civil Engineers. Prerequisite: junior or senior standing. Synthesis of systems modeling and simulation techniques, mathematical optimization procedures, and evaluation tools of multi-attributed 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.
5313* Highway Traffic Operations. Prerequisite: 3633. Level of service, capacity and service volume concepts. Operational characteristics of uninterrupted-flow and interrupted-flow traffic facilities. The 1965 HCM procedures for analyzing the capacity of freeways, multilane and two-lane rural highways, urban arterials, signalized and unsignalized street intersections, and transit and pedestrian facilities. Administrative and planning actions for congestion management. Design alternatives and improvement strategies for effective use of urban arterial street width.


5353* City Planning and City Organization. Lab 3. Prerequisite: senior or graduate standing. Orderly development and extension in city growth, civic legal and engineering aspects. Subdivisions, zoning, park system, water fronts, street systems, airports and transportation terminals, and traffic control. Functional organization of a city and city engineering organization.


5403* Advanced Strength of Materials. Prerequisite: 3113. General states of stress and strain, theories of failure, energy principles, beam bending, shear center, torsion of prismatic shafts, beams on elastic foundations, plates and shells, elastic stability.

5413* Classical Methods of Structural Analysis. Prerequisite: 3413. Advanced analysis of indeterminate frame structures, trusses and arches by classical, numerical, and energy methods with emphasis on methods for hand computations.


5433* Energy Methods in Applied Mechanics. Prerequisites: 3113, MATH 2233 or MAE 3323. Advanced structural mechanics from the standpoint of virtual work and variational calculus applied to the analysis of structures, mechanisms, dynamics, and vibrations.


5503* Computer-aided Structural Analysis and Design. Prerequisites: 3413, 3513 and 3523 (or consent of instructor). Selection of the most feasible rehabilitation techniques including recycling, surfacing, reconstruction, and rehabilitation techniques. Field and laboratory measurement of the engineering characteristics, strength and durability requirements, environmental effects and forensic analysis. ACI and PCA mix design procedures. Laboratory on theoretical and practical aspects of concrete technology.

5633* Asphalt Materials and Mix Design. Lab 1.5. Prerequisite: 3633 or consent of instructor. Principles of asphalt concrete mix design including material characteristics and performance. Evaluation of Hveem and Marshall mix design methods. Asphalt cements, rubberized asphalt polymer asphalts, emulsions, cutbacks, and aggregates. Laboratory sessions focused on the engineering properties of the materials discussed.

5673* Concrete Materials and Mix Design. Lab 1.5. Prerequisite: senior or graduate standing. Principles of concrete mix design including material characteristics, strength and durability requirements, environmental effects and forensic analysis. ACI and PCA mix design procedures. Laboratory on theoretical and practical aspects of concrete technology.

5693* Pavement Design and Analysis. Prerequisite: 3633 or consent of instructor. Principles of pavement design including stress analyses, load and environmental effects and material characteristics. AASHTO, PCA and AII methods of pavement design. Computer methods. Practical aspects of life cycle cost analyses and construction methods.

5703* Soils in Construction. Prerequisites: 3713, 4711 or consent of instructor. Soils types and general behavior during construction; earthwork construction, maintenance and specific considerations for embankments, pavements, and retaining structures; groundwater control during construction; soil modification and stabilization; and construction considerations for geosynthetics. Basic design considerations; including selection of placement conditions for compaction; proportioning of groundwater control systems; selection of type and amount of soil modifier, and design of geosynthetics to meet specific functions.

5713* Soil Mechanics. Prerequisites: 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 classification, exploration programs, field data, test results and construction materials and methods as basis for selection of type of foundation and design. Geotechnical design procedures and considerations.


5743* Soil-Structure Interaction. Prerequisites: 3713 or consent of instructor. Gravitational loading 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 including grade beams (beams on elastic 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 low quality and unstable soils for engineering purposes. Use of lime, fly ash, portland cement, asphalt, and other physical and chemical admixtures. Application of deep foundation stabilization methods such as preloading, deep compaction, injection, and reinforcement.


5813 Environmental Laboratory Analysis. Lab 3. Prerequisite: 4833 or concurrent enrollment. 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.

5923 Environmental Risk Assessment and Management. Prerequisites: an introductory class in statistics and background in engineering, management or science. Environmental risk assessment and management. Applies elements of statistics, probability and environmental simulation to determine the public health and ecological risks from activities of humans.

5833 Water Quality Management. Physical, chemical and biological factors in pollution and natural purification of rivers and lakes in relation to point and nonpoint sources of pollution. Development of low flow statistics and pollution loading functions for subsequent modeling projects. Dissolved oxygen and nonpoint source contamination models developed and applied.

5843 Hydrology II. Prerequisite: 3843. Physical phenomena of the surface water hydric processes. Derived and empirical models for evaporation, infiltration, basin runoff 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 chemistry and microbiology. Microbiological and biochemical principles applied to environmental engineering analysis and design.

5863 Advanced Unit Operations in Environmental Engineering. Prerequisite: 4833. Theory and design of advanced physical-chemical water and wastewater treatment processes applied to municipal, industrial, and hazardous waste situations.

5873 Air Pollution Control Engineering. Causes, effects and control of atmospheric pollution.

5883 Residuals and Solid Waste Management. Theory, design and operation of systems for handling, treatment, and disposal of process sludges (water treatment, wastewater treatment, industrial) and solid wastes. Potential material reclamation options.

5993 Hazardous Waste Management. Past and current hazardous waste management practices. Areas of concern and alternative approaches. An overview of important requirements and regulations.


5923 Water Resources Planning and Management. Application of engineering economics and microeconomic theory to the planning and management of water resources projects including flood control, hydroelectric, water supply, and urban stormwater. Systems analysis approaches, primarily linear and dynamic programming, and their application in water resources.

5933 Water Treatment. Prerequisite: 4833. Theory, design and operation of water treatment plants. Sizing of various unit processes. Water treatment plant control procedures.

5943 Unit Operations and Processes Laboratory. Lab 3. Prerequisite: 4833, 5813 or equivalent. Bench and pilot-scale experiments as physical models of water and wastewater treatments. Techniques of data collection and analysis applied to design of physical, chemical and biological processes.

5953 Biological Waste Treatment. Lab 3. Prerequisite: 4833 or equivalent. Fundamentals of microbial systems applied to waste treatment processes. Standard suspended-growth and fixed biofilm wastewater and sludge suspensions and treatment system design calculations.

5963 Open Channel Flow. Prerequisite: 3833. Open channel hydraulics, energy and momentum concepts, resistance, channel controls and transitions, flow routing, and sediment transport.

5973 Ground Water 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.

5993 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 90. Independent research under the direction of a member of the graduate faculty by students working beyond the level of Master of Science degree.

6010 Seminar. 1-6 credits, maximum 12. 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 subdisciplines of civil engineering by students working beyond the level of Master of Science degree.


6413 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. Introduction to shell bending theory.

6433 Structural Dynamics. Analysis of bars, frames, towers, multistory building and truss structures subjected to dynamic disturbances; investigation of lumped and distributed mass systems; natural frequencies, response spectra, applications to blast loading and earthquake analysis.

6434 Finite Element Analysis in Engineering. Prerequisite: consent of instructor. Finite element methods from an advanced viewpoint. Matrix mechanics; approximation theory; weighted residual and variational statements; shape functions and element types; parametric mappings; convergence criteria and error analyses; nonlinear and transient methods; eigenanalysis; programming techniques; applications to solid mechanics, structures, fluids mechanics, and thermal problems.

6444 Boundary Element Methods in Engineering. Prerequisite: consent of instructor. Matrix formulation and solution of complex two- and three-dimensional problems cast as boundary integral equations. Synthesis of integral relationships; elementary and advanced applications in solid mechanics, structures, fluids, and thermal problems; coupling with finite element analysis.

6533 Behavior of Reinforced Concrete Structures. Prerequisite: 5513. Influences of creep, shrinkage, repeated and dynamic loads, high temperature and complex states of stress on the performance of reinforced concrete structures.


6723 Advanced Geotechnical Engineering. Prerequisites: 3713 and GEOL 3024. Geologic occurrence 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 assesseive and remedial actions.
Computer Science (COMSC)

2113 (A)Computer Science I. Lab 2. Prerequisite: MATH 1513 or equivalent. Introduction to programming using a block-structured high-level computer language, including subprograms, arrays, and records. Principles of problem solving, good programming techniques, debugging, and documentation. Elementary methods of searching and sorting.

2133 Computer Science II. Prerequisite: 2113, consent of instructor. The concept of an algorithm in narrative, symbolic and PDL form. Application of iterative and recursive algorithms and elementary data structures.

2143 Computer Science III. Prerequisite: 2133. Elementary system programming using a high-level language. Programming with operating system utilities and system calls; basic file structures, processes, client-server systems.

2301 FORTRAN 77 Programming. Lab 2. Prerequisite: 2113. FORTRAN 77 control structures, arrays, subroutines, functions, input/output. A major programming assignment will be completed by each student enrolled in the course.

231 I Programming. Lab 2. Prerequisite: 2113. PL/I control structures, data structures, procedures, functions, recursive procedures, based variables, input/output.


2351 UNIX Programming. Lab 2. Prerequisite: 2113. The UNIX programming environment. The UNIX file system and the shell. Use of pipes and filters.

3423 File Structures. Prerequisite: 2143. Basic physical and virtual store device file organization and processing methods for sequential, direct, indexed, tree structured and inverted files. Application of data structure concepts to logical and physical file organization: Performance analysis. Elements of advanced data base systems.

3431 The C Programming Language. Prerequisite: 2133. C programming language types, operators, expressions, control flow, functions, structures, pointers, arrays, UNIX interface.

3443 Computer Systems. Prerequisite: 2123. Functional and register level description of computer systems, computer structures, addressing techniques, macros, linkage, input-output operations. Introduction to file processing operations and auxiliary storage devices. Programming assignments are implemented in assembly language.

3460 Assembly Language Programming. 1 credit. Lab 6. Prerequisite: 2123. Assembly language instructions, addressing modes, macros, pseudo-instruction, control and data registers, register conventions, writable control stores, virtual memory concepts. May be repeated for credit using different computer architectures.

3513 Numerical Methods for Digital Computers. Prerequisites: MATH 2155, 3013, knowledge of FORTRAN. Digital computer approximate solutions of algebraic and transcendental equations, solutions of simultaneous linear equations, numerical approximations, least squares curvefitting and applied topics. Practical programming experience in applications of these techniques.

5000 Research and Thesis. 1-6 credits, maximum 6. Prerequisite: consent of major 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 IN EN 4014; FORTRAN. Simplex algorithm to solve deterministic linear programming models considering maximization and minimization objectives; duality, alternative optima and no feasible solutions. Revised simplex procedures. Duality theory, economic interpretations, dual simplexing and complementary pivoting. Sensitivity analysis and parametric programming. Special cases of linear optimization problems and underlying mathematical foundations. Large-scale models including computational considerations. Same course as INDEN 5013.

5030 Professional Practice. 1-9 credits, maximum 9. Prerequisites: graduate standing in computer science, consent of the department head. Experience in the application of computer science principles to problems encountered in industry and government. Participation in problem solving in the role of junior computer scientist, junior software engineer, or computer science intern. All problem solutions documented. Required written report to the major professor.

5070 Seminar and Special Problems. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Designed to allow students to study advanced topics not provided in existing courses.

5113 Computer Organization and Architecture. Prerequisite: 4343. Computer architecture, computer control, microprogrammed control, addressing structures, memory hierarchies, hardware description languages, specific architectures, hardware simulation, emulation.

5154 Computer Science Migration. Lab 2. Prerequisites: graduate standing. A survey of computer science for students whose undergraduate major was not computer science. Programming in high-level languages. Programming in assembly language. Algorithm design and analysis. Computer system fundamentals. Fundamental data structures.

5253 Digital Computer Design. Prerequisite: ECEN 3223. Analysis and design of digital computers. Arithmetic algorithms and the design of the arithmetic/logic unit (ALU). Serial and parallel data processing; control and timing systems; microprogramming; memory organization alternatives; input/output interfaces. Same course as ECEN 5253.

5273 Advanced Software Engineering. Lab 2. Prerequisite: 4273. Continuation of 4273. Advanced theory and practice of software design methodology. Large-scale design and implementation problems. Experimental design for software engineering. Same course as ECEN 5273.


5323 Operating Systems II. Prerequisite: 4323. Task systems and concurrent programming, synchronization and inter process communication. Theoretical investigation of resource sharing and deadlocks, memory management, strategies, and scheduling algorithms, queuing theory, distributed operating systems. System accounting, user services and utilities.

5333 Compiler Writing II. Prerequisite: 4443. Continuation of 4443. Theory and practice of compiler writing techniques. Compiler writing systems. A formal approach to computer languages.


5413 Data and Storage Structures. Prerequisite: 4343. Data structures and their application in recursive and iterative algorithms. Static and dynamic data structure representations and processing algorithms. Dynamic and virtual storage management.

5423 Information Organization and Retrieval. Prerequisites: 3423, 4343. Storage, classification and retrieval of information, data bases, errors, multi-key files, indexing; dynamics of file reorganization, search strategies.


5513 Numerical Analysis I. Prerequisite: 4513 or MATH 4513. Algorithms and error analysis; solution of equations; interpolation and approximation theory.

5543 Numerical Analysis for Differential Equations. Prerequisite: 4513 or MATH 4513 and 4233. Advanced machine computing, algorithms, analysis of truncation and rounding errors, convergence and stability applied to discrete variable, finite element, and spectral methods in ordinary and partial differential equations. Same course as MATH 5543.

5553 Numerical Analysis for Linear Algebra. Prerequisites: MATH 3013 and COMSC 4513 or MATH 4513. Advanced machine computing, algorithms, analysis of rounding errors, condition, convergence, and stability applied to direct and iterative solution of linear systems of equations, least squares problems, including LU and QR factorization, conjugate gradients, QR algorithm, and Lanczos method. Same course as MATH 5553.

5653 Automata and Finite State Machines. Prerequisite: 5313. Finite state model, state diagrams and flow tables, equivalent states and equivalent machines. Formal grammars, context-free languages and their relation to automata. Turing machines, computability and recursive function. Same course as MATH 5653.

5663 Computability and Decidability. Prerequisite: 5313. Effectiveness, primitive recursivity, general recursivity, recursive functions, equivalence of computability, definitions, decidability, and recursive algorithms. Same course as MATH 5663.

5793 Artificial Intelligence and Expert Systems. Lab 2. Prerequisite: graduate standing in computer science. Fundamental concepts: search-oriented problem solving, knowledge representation logical inference, building. An expert system, artificial intelligence languages, specialized machine architecture, applications to planning, natural language processing and robotics. Development of an expert system or research report required. Common lectures with ECEN 5293, INDEN 5933, and MAE 5793.
6000 Research and Dissertation. 2-15 credits, maximum 30. Prerequisites: graduate standing and approval of advisory committee. Independent study under the direction of a member of the graduate faculty. For students working toward a Ph.D. degree.

6023 Nonlinear and Integer Optimization. Prerequisites: 5313 or INDEN 4013; FORTRAN or PASCAL. Theoretical and practical aspects of nonlinear and integer optimization. Development and application of nonlinear optimization techniques for unconstrained and constrained problems; sequential search, gradient, penalty and barrier, and projection methods. Development and application of integer and mixed integer techniques for unconstrained and constrained problems; implicit enumeration, branch and bound, and cutting plane methods. Same course as INDEN 6023.

6240 Advanced Topics in Computer Organization. 2-6 credits, maximum 12. Prerequisites: 5113 and 5253. Structure and organization of advanced computer systems; parallel and pipeline computer systems; methods of computation, alignment networks, conflict-free memories, bounds on computation time.

6253* Advanced Topics in Computer Architecture. Prerequisites: 5253 or ECEN 5253. Innovations in the architecture and organization of computers, with an emphasis on parallelism. Topics may include pipelining, multiprocessors, data flow, and reduction machines. Same course as ECEN 6253.

6300* Advanced Topics in Programming Languages. 2-6 credits, maximum 12. Prerequisite: 5313. Interpreter models of programming language semantics, Vienna definition language, lambda calculus, LISP definition; Knuth semantic systems and their formulation, translational and denotational semantics. May be repeated with change of topics.

6350 Advanced Topics in Operating Systems. 2-6 credits, maximum 12. Prerequisite: 5523. Design and analysis of operating systems. Concurrent processes, server scheduling, models of auxiliary storage, memory management, virtual systems, performance algorithms. May be repeated with a change in topics.

6400 Advanced Topics in Information Systems. 2-6 credits, maximum 12. Prerequisites: 5413, 5423. Design and analysis of data bases and other information systems. Hierarchical, network, and relational systems; implementation of database systems; update and retrieval algorithms; multi-user and security access mechanisms; distributed data base systems. May be repeated with change of topics.


6623 Algebraic Structures of Formal Grammars. Prerequisites: 5313, 5653. Context-free languages, Kleene languages, Dyck languages, context-sensitive languages; use of algebraic systems to define languages; linear bounded automata.

**Construction Management Technology (CONST)**

1213 Introduction to Building Construction. Lab 3. Fundamentals of light building construction; techniques of architectural drawings; methods and rational used in the development of plans, elevations, sections, details and construction drawing interpretation.

1333 Construction Practice. Prerequisite: departmental approval. Supervised field experiences in construction between the freshman and senior years, emphasizing the wide variety of layout, concrete placement framing and finish techniques employed.

2252 Drawing Interpretation. 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 and MATH 1513. Disk operating systems, introduction to programming in basic, word processing, spreadsheets, applications to the construction industry.

2334 Materials and Methods of Construction. Structural and finish materials used in architectural construction, their properties, manufacture and applications. Light, heavy and industrial construction. Foundation layout, framing and finish work, site investigations, excavation, precast concrete, tilt up, structural steel and metal building construction and project management.


3263 Estimating I. Prerequisite: 2252 or 2253. Quantity-take-off with emphasis on excavation, formwork and concrete, masonry, rough carpentry and miscellaneous specialty items.

3363 Timber and Form Design. Lab 3. Prerequisite: MECDT 3323. Basic timber structures with emphasis on concrete form applications.

3452 Mechanical Equipment of Buildings. Prerequisite: PHYSIC 1114. Plumbing, heating and air conditioning systems as applied to residences and commercial buildings.

3462 Electrical Equipment of Buildings. Prerequisite: PHYSIC 1214. Electrical and lighting systems as applied to residences and commercial buildings.


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. Prerequisite: 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 (Digi-tzer) 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.

4443 Construction Safety and Loss Control. Prerequisite: senior standing. Legal and insurance problems as they pertain to 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)**

0123 Improving College Reading Skills. Lab 1. Individualized instruction and lab experiences for the improvement of college reading and learning skills, including vocabulary, reading rate, comprehension and learning strategies. May be used to fulfill the reading improvement requirement established by State Regents policy. Graded on a satisfactory-unsatisfactory basis.

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.
2450 Early Lab and Clinical Experience in Elementary Education I. 1-2 credits, maximum 2. Lab 3-6. Prerequisite: declaration of intention to pursue a program in Teacher Education. The initial preprofessional clinical experience in schools, kindergarten through grade eight. Required for full admission to Teacher Education. 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. Literacy level interaction with microcomputer principles and techniques related to selection, evaluation and classroom instruction of instructional and tool application software.

3153 Teaching Mathematics at the Primary Level. Lab 2. Prerequisites: MATH 1513 and 3603 or consent of instructor. Development of experience in schools, kindergarten through grade five. Prerequisite: declaration of intention to pursue a program in Teacher Education. The initial preprofessional clinical experience in schools, kindergarten through grade eight. Required for full admission to Teacher Education. Graded on a pass-fail basis.

3223 Role of the Teacher in American Schools. Prerequisites: junior standing and filed Declaration of Intention to Pursue a Program in Teacher Education. One half-day per semester on-site lab required. A review of the school as an institution and an introduction to the role of the teacher as a professional in the schools. Socialization of the student to school and school life, the nature of multicultural education, school experiences of women and ethnic groups, school governance, professional organizations, ethics, and the nature of teaching.

3283 Foundations of Reading Instruction. Current theories of developmental reading instruction at the primary and intermediate grade levels.

3430 Early Lab and Clinical Experience in Elementary Education II. 1-2 credits, maximum 3. Lab 3-6. Prerequisite: 2450. Directed observation and participation in a particular subject area of the middle school, kindergarten through grade eight. Concurrent seminar explores 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 3. 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. Prerequisite: consent of instructor. 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 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 consideration, construction of laboratory materials and evaluation procedures in a mathematics laboratory. For experienced and inexperienced classroom teachers, superintendents, principals and mathematics supervisors.

3810 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. Teaching of the basic skill areas. Study and comparison of contemporary basic mathematics textbooks. Recommended to be taken concurrently with public school practicum experiences.

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 books which meet the needs and interest of children through grade six.

4043 Classroom Applications of Microcomputers. Lab 2. Prerequisite: 3132 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: full admission to Teacher Education. Overview of 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 MATH, full admission to Teacher Education. Strategies for teaching mathematical modeling. Problem classroom topics.

4113 Multi-media Program Production. Prerequisite: 3122. Design and production of synchronized automatic sound slide programs coordinated with subject matter content. Includes photographic techniques, audio recording and sound-mixing methods, graphics, and synchronizing techniques. Individual projects required.

4123 (S) 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. Prerequisites: 3153 and full admission to Teacher Education. Selection and organization of 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.

4143 Teaching LOGO in the Schools. Lab 0-2. Prerequisite: 3132 or equivalent. Instructional computing course for educators using LOGO language. Includes methods and integration techniques for teaching LOGO in grades K-12.

4213 Introduction to the Visual Arts in the Curriculum. Lab 4. 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 on both creative expression and appreciation of the visual arts in the home, school and community as a vital aspect of instruction in the school, preschool level through grade eight.

4222 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 Reading Diagnosis and Remediation. Lab 1. Prerequisites: 3283, full admission to Teacher Education. Identification and treatment of reading problems in the classroom including group and individual diagnostic procedures. Practical experiences required.

4253 Language Arts in the Elementary School Curriculum. 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. Relationship 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.


4293 Teaching Reading in the Elementary School. Lab 0-8. Prerequisites: 3283, 4233, full admission to Teacher Education. Application of skills, techniques and materials utilized in the effective teaching of reading in the elementary schools.
4313 Young Adult Literature. Survey of print and non-print materials, including multicultural and multilingual materials for young adults from middle school through high school. History, criticism, selection and evaluation of young adult literature and exploration of its relation to the needs and interests of young people. Same course as LIBSC 4313.

4323 Social Studies in the Elementary School Curriculum. 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 Level Curriculum. Prerequisites: enrollment in 3620 and full admission to Teacher Education. Objectives, organization, selection of content, teaching and learning procedures and evaluation of outcomes in middle level science.

4353 Science in the Elementary School Curriculum. 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 classroom management systems and teaching approaches.

4450 Internship in Elementary Education, 1-12 credits, maximum 12. Lab 3-36. Prerequisites: elementary clinical experience and full admission to Teacher Education. Advanced clinical experience as associate (student) teacher in schools, kindergarten through grade eight. Graded on a pass-fail basis.

4460 Kindergarten-Primary Education: Methods. 2-3 credits, maximum 3. Prerequisite: full 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. Prerequisites: full admission to Teacher Education and consent of instructor. Materials and procedures in the teaching of reading in secondary schools for content area teachers.

4560 Environmental Education. 1-4 credits, maximum 4. Lab 1. Development of (teacher/leader) competencies in the content, methods, philosophy, and historical perspective of contemporary environmental education curricula using both indoor and outdoor settings as a multidisciplinary learning laboratory.

4703 Computer Applications in the Middle School Science Curriculum. Prerequisite: 3132 or consent of instructor. Principles and techniques related to using microcomputer technology in teaching middle school science; microcomputer interfacing, simulation, and interactive videodisk.

4713 Methods and Materials in the Secondary School I. Prerequisite: full admission to Teacher Education. Purposes, selection and organization of content, teaching and learning procedures, and evaluation of outcomes in grades 7-12 appropriate for the discipline in which the student intends to qualify for teaching certification. Available to students in discipline-specialized sections: art, foreign languages, English/language arts, mathematics, science, social studies.

4720 Internship in the Secondary Schools. 1-12 credits, maximum 12. Lab 3-36. Prerequisites: 3223 or equivalent, 3710, 4713, 4723 and continued full admission to Teacher Education. Supervised observation and student teaching in fields in which the student intends to qualify for teaching certification. Development of awareness of and experience with mental, social, physical and cultural differences among adolescents. Graded on a pass-fail basis.

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. Combination 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: English/language arts, mathematics, science, social studies.

4730 Methods and Materials in the Schools, K-12. 1-3 credits, maximum 3. 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 K-12. Available to students in discipline-specialized sections: art, foreign languages.

4913 (I)International Problems and the Role of the School. Prerequisite: junior or senior standing. Extends the student’s intercultural awareness by focusing on international problems and expanding their meaning to include the school and its relationship to existing international concerns in other types of societies. Consideration of such international problems as natural resources, environment, food supply, urbanization and conflict resolution.

5000 Master’s Report or Thesis. 1-6 credits, maximum 6. Prerequisite: consent of adviser. Students studying for a master’s degree enroll in this course for a total of 2 credit hours if they write a report or 6 hours if they write a thesis.

5023 Comparative Education. A systematic investigation of educational institutions in various nations for the purpose of an enlarged, critical view of American education.

5033 Teaching Foreign Languages in the Schools. Prerequisite: graduate standing or full admission to Teacher Education. Curriculum, materials, methods and procedures related to foreign languages (grades K-12).

5043 Fundamentals of Teaching. Prerequisite: ABSED 5213 or 5463. Theory and research on teaching applied to classroom teaching behavior.

5053 Fundamentals of Curriculum Development. A study of curriculum that includes philosophy, history, decision making, major concepts and terms.

5103 Advanced Computing Applications in Education. Lab 0-2. Prerequisite: 4043 or equivalent. Includes educational applications involving authoring systems, data-base management, hardware interfacing, and non-instructional uses within the school environment. Impact of current issues on instructional computing.

5113 Videotape Television for Instruction. Prerequisite: 4113. Educational design and production of videotape using single camera, small studio production and other technology. Individual and team projects.


5130 Advanced Studies in Children’s Literature. 1-3 credits, maximum 6. Prerequisite: 4023. The history of children’s books against a world background of prevailing political, economic and social factors influencing cultural patterns and values. The tools of research in children’s literature and the nature and direction of contemporary children’s book publishing in the United States and abroad.

5133 Photography for Instruction. Prerequisite: 3122. Photography such as fine art, black and white, and instant type cameras with application to instruction and other communication situations such as photo-copying, use of high-contrast film for graphics, and simple photography projects for school-age students.

5143 Language Arts in the Curriculum. Content and current issues in the language arts. Materials and methods for teaching the communication skills.

5153 Computer-Based Instruction Development. Lab 0-2. Prerequisite: 4043 or equivalent. Examinations of curriculum strategies, related research issues, and techniques for developing computer-based instruction. Students will develop and evaluate computer-based instruction with case studies.

5173 Kindergarten-Primary Curriculum (K-2). Current kindergarten-primary (K-2) curriculum models and programs including aims, content, methodology and evaluation. Current trends and issues in early childhood education; curriculum design and implementation. Primarily for administrators, supervisors, teachers and advanced students in early childhood education.

5223 Teaching Science in the Elementary School. Materials, methods and classroom procedures related to science in the elementary school.


5270 Practicum in School Mathematics. 1-3 credits, maximum 6. Lab 2-6. Prerequisite: 5263. Diagnostic and therapeutic procedures in mathematics with students of all ages. Laboratory classes provide for clinical experiences in evaluation and instruction with children experiencing difficulty in mathematics.

5280 Workshop in Science Education. 1-4 credits, maximum 4. Develops and/or implements elementary and secondary science programs.

5323 Teaching Social Studies in the Schools. Curriculum, materials, methods and procedures related to social studies.

5350 The Visual Arts in the Curriculum. 1-3 credits, maximum 6. Lab 2. Prerequisite: 4213. Creative approaches to the use of two- and three-dimensional media as they relate to various aspects of education. Opportunities available for periodic group and individual evaluation in order to give direction and significance to future growth.

5423 Developmental Reading at the Primary Level. Prerequisites: 3283, 4223, 4293 or 4473 or consent of instructor. Analysis of sequential growth in reading from the preschool level through the early elementary years. Examination of the reading process and instructional procedures.

5463 Diagnosis and Treatment of Reading Problems. Prerequisite: 5423. Diagnosis of reading disabilities, remedial measures and work with clinical cases.

5473 Clinical Aspects of Reading Disability. Prerequisite: 5463. Refines the diagnostic and remedial skills of the student through the study of clinical instruments, research, informal measurements and remedial approaches used in reading clinics.

5510 In-service in Reading. 1-6 credits, maximum 6. Guidance in the development of reading curricula, programs, methodology and materials for in-service teacher education groups. Content developed around needs of specific groups.

5520 Practicum in Reading. 1-6 credits, maximum 6. Lab 2-4. Prerequisite 5463. Application of diagnostic and therapeutic procedures with readers of all ages. Laboratory classes provide for clinical experience in evaluation and instruction in developmental and remedial programs in reading for children.

5613 Effective Teaching of Mathematics in the Secondary School. Prerequisite: consent of instructor. Directed advanced practicum in secondary school mathematical education. Includes study of current research findings in mathematical education, teaching strategies, materials and evaluation procedures in the secondary school. For experienced classroom teachers, superintendents, principals and supervisors.

5623 Curriculum for the Culturally Different Elementary School-age Child. Procedures, materials, curricula, techniques, instructional strategies, etc. to aid the teacher in developing an educational program for the culturally different child.

5633 Developmental Reading for College and Adult Learners. Identification of the needs, materials, curricula, and instructional strategies for college and adult readers. The study of illiteracy. Consideration of the development, organization and supervision of programs for such learners.

5720 Education Workshop. 1-8 credits, maximum 8. For teachers, principals, superintendents and supervisors who have definite problems in instruction or administration. Students must register for the full number of credit hours for which the workshop is scheduled for a particular term.

5730 Seminar in Education. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Seminar topics may differ depending upon the nature of current interests and topics in American education.

5740 Seminar in Teacher Education. 3-9 credits, maximum 9. For cooperating teachers and university supervisors. Problems and issues in pre-service teacher education. Simulation and laboratory experiences in supervision of student teachers.

5750 Seminar in Mathematics Education. 1-3 credits, maximum 3. Lab 0-2. Prerequisite: consent of instructor. Problems, issues, and trends in mathematics education.

5753 Educational Technology Strategies. Lab 1. Prerequisite: 4043 or 5053 or consent of instructor. Principles of designing instructional units and courses incorporating integrated advanced technologies within the framework of the current educational environment. Contemporary education issues. Advanced educational technologies: information management, accessibility, linkage to curricula, support, planning, and teacher empowerment. Assumes concept of teacher as designer/conductor vs. teacher as consumer.

5773 Administration and Supervision of Audiovisual Materials. Prerequisite: 3122. Building, planning, selecting and purchasing equipment and materials, surveying existing materials, and planning and financing adequate programs. For administrators or teachers who are responsible for audiovisual programs.

5823 Institutional History of Education. History of elementary, secondary, and higher education in Western Civilization with emphasis upon the development of the American educational institution.

5850 Directed Study. 1-3 credits, maximum 3. Lab 1-3. Prerequisite: consent of instructor. Directed study for master's level students.

5853 Educational Sociology. The manner in which social forces and institutions influence education and the educational system in the United States.

6000 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.

6033 Analysis of Teaching. Students examine research related to teacher classroom behavior, classroom climate and student behavior and develop competencies in several observational systems.

6080 Seminar in Science Education. 1-6 credits, maximum 6. Problems, issues and trends in science education. The focus at the pre-service or in-service level.

6113 Curriculum of the Elementary School. Contemporary 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. Prerequisite: 5403. 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.

6633 Developmental Reading and Exceptionality. Prerequisite: 5423 or 5433. Developmental reading needs of various groups of exceptional individuals. Methods and materials of instruction.

6650 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.

6653 Improvement of Instruction in Reading. Problems and issues related to reading instruction. The roles of various school personnel in effecting change in curriculum and methods.

6680 Internship in Education. 1-8 credits, maximum 8. Lab 3-24. Prerequisite: consent of instructor. Directed off-campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

6910 Practicum. 1-6 credits, maximum 6. Prerequisite: consent of advisor. Helps the student carry out an acceptable research problem (practicum) in his/her local school situation. Credit given upon completion of the written report.

Design, Housing and Merchandising (DHM)


1103 Basic Apparel Construction. Lab 4. Basic apparel construction techniques. Problems including basic fit, pattern selection and alteration, use of plaid, use of sewing machines and Sergers, and basic sewing techniques.

1123 Graphic Design for Interiors. Lab 6. Interior design majors only. Drafting and visual communication techniques related to interiors.

1433 Fashion Innovation and Marketing. The processes of fashion innovation; variables of fashion affecting production and distribution of consumer goods; development of present structure in the fashion industry.
2003  Creative Problem Solving in Design and Merchandising. Participatory problem solving in design and merchandising; critique of proposed solutions as a positive process of evaluation.


2110  Fashion Showmanship. 1 credit, maximum 8. Preparation, production and evaluation of special fashion-related events. Professional learning experiences will include modeling techniques, organization and directing procedures.


2303  Materials and Finishes for Interior Building Systems. Lab 4. Prerequisites: 1003, 1123, 2993. Materials and procedures used in the design and production of interiors and building systems.

2343  Design and Space. Lab 6. Prerequisites: 1123, 2223 and 3313. Creative exploration of three-dimensional spaces in interior design.

2573  Textiles for Consumers. Lab 2. Consumer-oriented study of textiles emphasizing fibers, care and serviceability of apparel and household fabrics.

2993  Communication and Presentation Techniques for Apparel and Interior Design. Lab 4. Prerequisites: 1003, ART 1103 and SPCH 2713. Creative communication methods and techniques including a variety of media for two- and three-dimensional presentations in apparel and interior design.

3002  (S)Professional Image and Dress. Role of appearance and dress in creating a professional image for men and women. Figure and wardrobe analysis, professional clothing needs, individualized clothing decisions.

3003  (S)Environmental Perspectives on Apparel and Interior Design. Analysis of apparel and interior design, development and use from physical, technological, economic, political, religious, social and aesthetic perspectives.

3013  Flat Pattern Design. Lab 4. Prerequisites: 2203 and MATH 1513. Interpretation of dress design developed through the medium of flat pattern; introduction to pattern drafting.

3102  Advanced Flat Pattern Design. Lab 4. Prerequisite: 3013. Advanced apparel design problems using flat pattern and CAD techniques.

3102  Fashion Sketching. Lab 4. Prerequisites: 1003 or 3 credit hours of art and completion of 60 credit hours. Principles and techniques of sketching in the fashion field.

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, 3013 and 4 credit hours of chemistry. Problem-solving approach to functional clothing design for specialized 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)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 people. Application of design principles to modern dress.

3233  (H)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.

3243  Design of Interior Components. Lab 4. Prerequisite: pass proficiency review. Design, construction and production of interior design components including custom furnishings and interior treatments and modification.

3253  Environmental Design for Interior Spaces. Lab 4. Prerequisite: pass proficiency review. Design factors and human performance criteria for lighting, acoustics and thermal/ atmospheric comfort as they relate to the practice of interior design.

3263  Interior Design Studio I: Residential. Lab 4. Prerequisite: pass proficiency review. Studio course utilizing the design process in the analysis and planning of residential environments.

3300  Supervised Field Experience. 1-3 credits, maximum 6. Prerequisite: 3243 or consent of instructor. Field experience in specialized residential, commercial and institutional design with both historical and contemporary elements.

3353  (S,SpD)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.

3363*  Interior Design Studio II: Small Scale Contract. Lab 4. Prerequisites: 3243 and 3263. Studio course utilizing the design process in the analysis and planning of small office, institutional and retail environments with emphasis on materials, lighting, codes and accessibility.

3373  Computer-aided Design for Interiors. Lab 4. Prerequisite: 1123. Computer-aided design and drafting for two-dimensional and three-dimensional interior systems.

3433  Fashion Retailing. Prerequisites: 1433, ACCTG 2103, ECON 1113. Marketing structures at retail level; job descriptions and responsibilities at management level; financial and control functions.

3533  Decorative Fabrics. Lab 4. Prerequisite: 3 credit hours in art. Historic and contemporary textile designs. Creation of textile designs using personal inspirations, cultural expressions and a variety of techniques.

3643  Apparel and Accessories for Special Markets. Prerequisites: 1433, PSYCH 1113, SOC 1113, and completion of 60 credit hours. An analysis of the apparel and accessory needs of specialized market segments and the products designed to meet the needs which have given to both product design and merchandising.

3663  Fashion Promotion Media. Lab 2. Prerequisites: 1433 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 promotion activities.

3823  Professional Practices for Interior Design. Prerequisites: 2343, 3263 and 3303. Future professional role and responsibilities, business procedures and employer-employee relationships which characterize the employment situation in interior design.

3853  Merchandise Display Essentials. Lab 2. Prerequisites: 1003, 1433 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 merchandise from retail stores.

3991  Pre-Internship Seminar. Prerequisites: 24 credit hours of required DHM courses and SPCH 2713. Skills requisite to completion of a directed, practical experience in a work situation within the fashion industry.

3994  Internship. Lab 4. Prerequisites: 3433, 3663 and 3991 (apparel merchandising students); 3013 and 3991 (apparel design students). 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.

4143*  Design for Special Needs. Problems and alternative solutions for apparel and interiors for special groups, e.g., the aging, children, the handicapped, special markets. Includes field study or design problem.

4163*  (H)Living in Other Cultures. Housing and interior design and expressions of cultural beliefs, customs, family patterns and environmental influences.

4243  Draping. Lab 4. Prerequisite: 2203. Interpretation of garment design developed through the medium of draping on dress forms.

4263*  Interior Design Studio 111: Large Scale Contract. Lab 4. Prerequisites: 3253, 3363 and 3823. Studio course utilizing the design process in the analysis of large scale office planning and institutional design including systems and specifications.

4293*  Interior Design Studio IV. Lab 4. Prerequisite: 4263. Studio course developing comprehensive interior design projects in historic preservation and adaptive reuse and an advanced design project.

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.

4403*  Creative Costume Design. Lab 4. Prerequisites: 3213, 3013 and 4243 or consent of instructor. Application of design principles and construction techniques in the development of original designs.
Facility Management for Contract Interiors. Philosophy and principles of facility management and the practice of coordinating the physical workplace in relation to the workforce and organizational structure of the corporate environment.

Entrepreneurship and Product Development for Apparel and Interiors. Prerequisites: ECON 1113 and completion of 90 credit hours. In-depth study of entrepreneurship concepts as applied to manufacturers and retailers of apparel and interior products including product development, accounting and control, merchandising and buying, operation and management, advertising and promotion.

Critical Issues in Design, Housing and Merchandising. Prerequisite: senior standing. Capstone course examining critical issues in design, housing and merchandising in the context of central themes from general education.

Profitable Merchandising Analysis. Prerequisites: 3443 and 3994. Relationship analysis of profit and loss statement. Retail mathematical calculations necessary to plan and control merchandising results, open-to-buy, mark-up, mark-down, turn-over, stock-sales ratio.

Analysis of Current Literature Including Research in Design, Housing and Merchandising. 1-2 credits, maximum 2. Analysis of current research in relation to design, housing and merchandising.

Professional Internship. 1-6 credits, maximum 6. Prerequisites: 3823 and consent of instructor. A supervised internship experience which simulates the responsibilities and duties of a practicing professional.

Special Unit Course in Design, Housing and Merchandising. 1-6 credits, maximum 6. In-depth study of specific areas of design, housing and merchandising.

Textiles and Apparel in the International Economy. Prerequisites: 2013, ECON 1113, and 90 hours. Broad multi-disciplinary study of textiles and apparel in the international economy.

Master’s Thesis. 1-6 credits, maximum 6. Prerequisites: graduate standing and consent of major professor. Research related directly to design, housing and merchandising for the master's thesis.

Theoretical Perspectives for Design, Housing and Merchandising. A study of terminologies associated with theory. Exploration of key theories and their application to practice and research in design, housing and merchandising.

Research Developments in Design, Housing and Merchandising. 1-3 credits, maximum 3. Current development and needs in research in design, housing and merchandising including application of research methods to design, housing and merchandising and research planning.

Theories of Creative Process in Design and Merchandising. A study of the creative processes used in art, science, business and hybrid disciplines, with application to design and merchandising.

Design Evaluation. Prerequisite: consent of instructor. Theoretical perspectives on evaluation of applied design; examination and evaluation of historic and contemporary designers, their philosophies and their work.

Studio Design Practicum. 1-3 credits, maximum 6. Prerequisite: consent of instructor. An in-depth analysis of the theoretical design models and philosophies to professional practice. A maximum of six hours to be used by graduate students following Plan III for the master’s degree.

Interpretative Theories of Material Culture. A theoretical analysis of the influences of cultural values and characteristics upon the design, acquisition and use of apparel, furnishing and building products, and the cultural diffusion of those material goods.

Constructive Environment and Human Behavior. Prerequisites: 5110, 5273, PSYCH 1113, SOC 1113. An exploration and evaluation of the physical attributes of the constructed environment and the interrelationships with the social and psychological aspects of human behavior.

Advanced Studies in Design, Housing and Merchandising. 1-6 credits, maximum 6. Investigation into special areas in the fields of design, housing and merchandising.

Design, Housing and Merchandising in Higher Education. Prerequisite: 9 credit hours in design, housing and merchandising. Development and organization of curricula and teaching methods for design, housing and merchandising.

Apparel Merchandising and Design Career Internship. 1-6 credits, maximum 6. Prerequisite: consent of instructor and department head. An individualized career-oriented internship. Selected learning experiences in approved work situations in the fashion industry or in selected educational or research activities related to apparel merchandising and design.

Fractional Apparel: Theory and Design. Lab 4. Prerequisite: 2573, 4013, 5110. A holistic approach to the study of apparel design with an emphasis on integrating knowledge of the needs and functions of the individual, the structural properties of textiles and apparel design.

Merchandising Trends, Practices and Theories in Apparel and Interior Industries. Prerequisite: nine credit hours in marketing or merchandising. Current trends in merchandising; theories, concepts and processes related to management level problems.

Problems in Design, Housing and Merchandising. 1-3 credits, maximum 6. Prerequisite: consent of instructor and department head. Individual and group investigations and discussions of special problems in the various phases of design, housing and merchandising.

Design, Housing and Merchandising Seminar. 1-6 credits, maximum 6. Prerequisite: consent of instructor. A selected group of current issues in design, housing and merchandising.

Doctoral Thesis. 1-12 credits, maximum 30. Prerequisite: consent of major professor. Research in design, housing and merchandising for the Ph.D. degree.

Research Methods in Design, Housing and Merchandising. Prerequisite: consent of instructor. Survey and discussion of research methods, experiences in research design and analysis of data.

Theories of Dress and Communication. Appearance as a type of nonverbal communication related to appearance. Theoretical structures depicting the use of dress in communication.

Sociological, Psychological and Economic Aspects of Consumer Behavior. Prerequisite: 5653. Analysis and integration of social, psychological and economic theories related to consumer acquisition of products. Application and testing of these theories as appropriate to apparel and interior consumption processes.

Merchandising Theory Application and Strategy Implementation. Prerequisite: 5653. Integration of marketing, merchandising, and management theories, strategies, models, and frameworks. Application of theories and implementation of strategies relevant to apparel and interior industries.

Independent Study in Design, Housing and Merchandising. 1-3 credits, maximum 6. Prerequisites: consent of instructor and department head. Selected areas of design, housing and merchandising for advanced graduate students working toward the doctorate degree.

Advanced Problems in Design, Housing and Merchandising. 1-6 credits, maximum 6. Prerequisites: consent of instructor and department head. Intensive individual or small-group study of problems in various areas of design, housing and merchandising for advanced graduate students who are working toward doctorate degrees.

Design, Housing and Merchandising Seminar. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Problems and recent developments in design, housing and merchandising.

Economics (ECON)

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 growth 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. No general education credit for students also taking ECON 2013 or AGEC 1114.

Introduction to Macroeconomics. Prerequisites: 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. No general education credit for students also taking ECON 1113 or AGEC 1114.

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.
Special Topics in Economics. 1-3 credits, maximum 9. Prerequisites: 2023, prior approval of instructor. Analysis of a contemporary topic in economics. Course content will vary to reflect changing social issues and trends in applied economics.

Managerial Economics. Prerequisite: 2023. Application of economic theory to decision problems of private industry, nonprofit institutions and government agencies; demand and cost analysis, forecasting, pricing and investment.


Intermediate Macroeconomics. Prerequisite: 2023. Development of a theoretical framework for studying the determinants of national income, employment and general price level. National income accounting, consumption, investment, government spending and taxation, the supply of and demand for money. Monetary, fiscal and incomes policies considered with regard to unemployment, inflation and economic growth.

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.

Public Finance. Prerequisite: 3 credit hours in economics. The economics of the government sector. Scope of government activity, efficiency in government expenditures, federal budget, fiscal and credit management policy. Principles of taxation. Major tax sources, tax distribution, tax issues. Current public finance problems such as revenue sharing, negative income tax, urban transport systems and national health insurance.

Labor Economics and Labor Problems. Prerequisite: 3 credit hours in economics. Economic analysis of contemporary labor market problems and survey of U.S. unionism. The labor force, education and training, discrimination, inflation and unemployment theories of the labor movement, economic impact of unions and public policy toward labor.

Poverty and Economic Insecurity. Prerequisite: 3 credit hours in economics. Problems, programs and proposals for dealing with poverty and economic insecurity.

International Economic Relations. Prerequisite: 3 credit hours in economics. International trade and finance; international economic organizations; the foreign economic policy of the U.S.

Government and Business. Prerequisite: 3 credit hours in economics. Methods of measuring the extent of monopoly power in American industries and ways of evaluating the effects of this power on consumer welfare. U.S. antitrust laws, their enforcement and landmark court decisions under these laws.

Development of Economic Thought. Prerequisite: 3 credit hours in economics. The ideas of great economists with emphasis upon economic concepts and systems of thought in relation to social, ethical and political ideas under evolving historical conditions.

American Economic History. Economic development and economic forces in American history; emphasis upon industrialization and its impact upon our economic society since the Civil War. Same course as HIST 4513.

Economics of Energy and the Environment. Prerequisite: 2023. Issues related to the development and use of energy resources, and the management of the natural environment.

Economics Honors Seminar. 3-6 credits, maximum 6. Prerequisite: Honors Program participation. Topical seminar in economics for junior and senior students in the Honors Program. Special problem areas of the economy or the economics discipline. Appropriate for Honors students in any major.

Basic Studies in Economics. 1-6 credits, maximum 6. Prerequisite: 3 credit hours in economics. Economic concepts, theory, issues and problems. Designed for elementary and secondary teachers. Economics education teaching methods included.

Econometric Methods. Prerequisites: 2023, STAT 3013 or 4013. Basic quantitative methods used in economic analysis emphasizing applications to economic problems and interpretation of empirical results. Statistical analyses, regression and forecasting techniques using computer programs.

Business and Economic Forecasting. Prerequisites: 2023, STAT 3013 or 4013. Forecasting business and economic variables. Regression models and time series models such as exponential smoothing models, seasonal models, and Box-Jenkins models. Evaluation of methods and forecasting accuracy. Application of methods using computer programs.

Advanced Banking. Prerequisite: 3313. Central and commercial banking, including Federal Reserve policymaking, banking structure, capital adequacy and taxation of banks. Friedman's proposals for monetary and banking reform.

State and Local Government Finance. Prerequisite: 3 credit hours in economics. State and local government revenue and expenditure patterns in a federal fiscal system; intergovernmental fiscal problems; taxation in a federal system; adjustment to economic growth and change.

Labor and Public Policy. Prerequisite: 3513 or MGM 3313 or BUSL 3213. Public policy affecting union management relations; common law, state and federal legislation; Wagner, Taft-Hartley and Landrum-Griffin Acts; labor dispute adjustment with emphasis on the theory, legal status and practice of arbitration, in both private and public sectors.

International Economic Development. Prerequisite: 3 credit hours in economics. Problems of underdeveloped economies related to the world economy; obstacles to economic growth and policies for promoting growth.

Economics of Industries. Prerequisite: 2023. Industrial organization of major U.S. industries. The structure-conduct-performance paradigm is used to evaluate how costs and concentration interact with pricing, marketing and R&D decisions to affect industry profitability, technological progress, and the efficient allocation of resources. Case studies included.

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 various alternative rules of law on economic efficiency and behavior. Emphasis on the economics of the common law areas of property, contracts, and torts. Also, products liability, crime and punishment, distributive justice, and discrimination.

Comparative Economic Systems. Prerequisite: 2023. Comparative analysis of the economic theory and institutions of capitalism, socialism, and mixed systems.

Urban and Regional Economics. Prerequisite: 3 credit hours in economics. Urban and regional economics; the spatial aspects of poverty, land use, the urban environment and rural industrial development.

United States Economic Development. Prerequisite: 2023 or 2123. Changing patterns of human and material resource utilization in the United States. Market forces and structural and institution changes that have affected the economy's growth.

Economics 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, with second faculty reader and oral examination. Required for graduation with departmental honors in economics.

Research and Thesis. 1-6 credits, maximum 6. Workshop for the exploration and development of research topics. Research leading to the master's thesis.

Research Report. Prerequisite: consent of committee chairperson. Supervised research for M.S. report.

Research and Independent Studies. 1-3 credits, maximum 10. Prerequisite: consent of departmental committee under a workshop arrangement or supervised independent studies.

Contemporary Environmental Policy. Economic, social and political factors that influence the formation and implementation of environmental policy. Environmental policy instruments (including pollution taxes, standards and marketable pollution permits), measurement of environmental damages and risk. Risk comparison, regulatory issues, health risk assessment, and risk communication. Political-economic considerations.

Microeconomic Theory I. Prerequisites: 3113, MATH 2265 or MATH 2713. Contemporary price and allocation theory with emphasis on comparative statics.

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.
6263. Strategies, techniques and solutions the
The Principalship.

6003* Critical Issues in Higher Education.
Decision-making processes utilized in educational systems today.

5940* Educational Administration and Higher Education 231
6243 Organization and Administration of Education.
Research and best practice in the organization and administration of educational organizations.

6253* Organization, 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.

6233 Public School Business Management. Prerequisite: graduate standing. Knowledge and skills in budget planning and development, administration and evaluation. School accounting, other business management topics.

6353 The Superintendency. Prerequisite: consent of instructor. Integration of theory and practice through examination of roles and responsibilities of the superintendent. Particular emphasis on leadership, communications, and the changing nature of public education.

6363 Educational Finance: A National Perspective.
Prerequisite: graduate standing. Theory and practice of financing American 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.

6453 Legal Aspects of Education.
Legal aspects of education with special reference to Oklahoma. Separate sections for common schools and higher education. Considerable legal research required.

6463 Higher Education Law.
State and national constitutional provisions, laws, and court cases concerning higher education. Considerable legal research required.

6473 Practicum in Instructional Supervision.
Prerequisite: 6263 or consent of instructor. Applica-
tion of modern approaches to instructional sup-
vension through practice in recording and analyzing teacher behavior in actual classroom settings. Clinical and group methods for improving instruction are considered.

6573 School Facilities.
Prerequisite: 6453 or equivalent. Established standards and research in school facilities; validity of standards.

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.

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, support and control. Principles, practices and problems of community junior colleges in America.

6703 Finance in Higher Education.
Prerequisite: 6753. Problems and prospects of financing American education, with in-depth discussion of selected topics, e.g., social capital, federal aid, faculty salaries and state support.

6710* Special Problems.
1-4 credits, maximum 8. Prerequisite: teaching or administrative experience. Assists administrators with either recurrent or unique problems arising in common schools or in higher education. Emphasizes evaluation and planning related especially to staff, programs and faculty needs.

6713 Effective Teaching in Colleges and Universities.
Research findings on teaching-learning relationships at the college and university level. Study of methods employed to encourage, guide and evaluate student learning. Investigation and appraisal of newer 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 instructional 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.
Electrical and Computer Engineering (ECEN)

3013 Experimental Methods. Lab 4. Prerequisites: ECEN 3613, concurrent enrollment in 3113 and 3313. Basic electrical and electronic measurements and instrumentation techniques and devices. Operating principles and application of various instruments used in the practice of electrical engineering. Experiments in electronics and electromagnetic fields, designed to reinforce principles introduced in ECEN 3313 and ECEN 3613. Data processing and reduction techniques.

3113 Energy Conversion I. Lab 2. Prerequisite: 3613, concurrent enrollment in 3113 and 3313. Physical principles of electromagnetic and electromechanical energy conversion devices and their application to conventional transformers and rotating machines. Network and phasor 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.


3313 Electronic Devices and Applications. Prerequisites: 3713, concurrent enrollment in 3013, 3113. Semiconductor electronic components including MOSFETs, BJTs, FETs, and Op-amps. Emphasis on device models and use of solid state electronic devices to analyze, synthesize and design amplifiers and switching circuits. SPICE simulations are extensively utilized. Basic building blocks for analog and digital applications.

3413 Controls I. Prerequisites: ENGC 2122; ENGC 2613, MATH 2233, MATH 3013, 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 Electromagnetic Fields. Prerequisites: ENGC 2613, MATH 2233, concurrent enrollment in 3413, 3713. Development of Maxwell's equations and their application to engineering problems in electrostatics, magnetostatics, plane wave propagation, and transmission line theory.

3713 Network Analysis. Prerequisites: ENGC 2613, MATH 2233; concurrent enrollment in 3413 and 3613. Laplace transform, transfer functions, magnetically coupled circuits and two-port networks.


4001* Electrical Engineering Seminar. Prerequisite: senior standing. Topics on professionalism technical and professional societies, and current industrial developments. Individual or group reports prepared and presented.

4010* Technical Problems and Engineering Design. 1-12 credits, maximum 12. Prerequisite: consent of instructor. Individual independent study projects selected in consultation with the instructor; analysis or design problems, literature searches and computer simulations may be involved.

4013 Senior Design Laboratory I. Lab 2. Prerequisites: 3013, 3113, 3313, and 3213 or 3233. Complete design cycle for several small design projects, each including establishing objectives, synthesis, analysis, construction, testing and evaluation. Use of modern lab equipment and fabrication techniques. Development of communication skills.

4023 Senior Design Laboratory II. Lab 2. Prerequisite: 4013. Continuation of ECEN 4013. Student projects continue 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, digital factors, safety, reliability, aesthetics, ethics and social impact.

4133* Power Electronics. Prerequisite: 3113. Power electronic devices, components, and their characteristics; DC to AC conversion; fundamentals of inverter and waveform shaping devices; application aspects; control aspects; characteristics and state-of-the-art of advanced power inverter and power conditioning topologies.

4153* Power System Analysis and Design. Prerequisite: 3113. Power system component models from circuit theory. Formulation and design of the load flow model and the optimum economic generator allocation problem utilizing computer methods.


4243* Computer Architecture. Prerequisites: 3213 and 3233. Functional organization and hardware design of digital computer systems with emphasis on microprocessor-based systems. CPU organization, features of microprocessors including advanced 32-bit CPU's, memory system design including cache, virtual memory, error detection and correction, I/O operations including direct memory access and peripheral interface design.

4263* Computer Engineering Projects. Lab 2. Prerequisites: 3233, 4013 and 4213. Team projects involving design, construction, and testing of hardware interfaced with mini- and micro-computers in instructional laboratory. Emphasis on software and hardware documentation. IEEE-488 bus; international and national standards. Industrial developments. Individual or group reports prepared and presented.


4283* Software Engineering. Lab 2. Prerequisites: COMSC 2123, 3443 or ECEN 3213. Fundamental characteristics of the software life cycle. Tools, techniques, and management controls for development and maintenance of large software systems. Software metrics and models. Human factors and experimental design. Same course as COMSC 4283.

4303* Computer Networks I. Lab 2. Prerequisite: 3313. Theory of digital and electronic circuits. Digital logic families TTL, I, IL, ECL, NMOS, CMOS, GaAs. Large signal models for transistors. Implementation at RAM and ROM. Circuit design for LSI and VLSI.
4313 Linear Electronics Circuit Design. Prerequisites: 3313, Class A and B small-signal, push-pull power, complementary symmetry, differential and operational amplifiers, utilizing field-effect transistors, bipolar transistors, tunnel diodes and integrated circuits. Emphasis on amplification in electronic devices, design and analysis of wide-band amplifier circuitry.

4353 Communication Electronics. Prerequisite: 3313. Design of tuned voltage and power amplifiers, oscillators and mixers, modulation and decryption, and parametric amplifiers.

4413 Controls II. Prerequisites: 3413, 3513, 3713. Design of analog and digital feedback control systems, review of functions and state variable models for continuous-time and discrete-time systems, sampling, relationship between pole locations and time response, frequency domain design, root locus design, continuous-time and discrete-time compensation techniques, state variable feedback and pole positioning design.

4423 Nonlinear and Digital Control Systems. Lab 2. Prerequisite: 4413. Nonlinear control systems; phase plane analysis. Liapunov stability criteria, describing functions; signal-modulated systems, sampled-data control and difference equations, transform analysis, introduction to optimization of control systems and computer simulation of control system.


4623 Plasma Dynamics and Microwave Electronic Devices. Prerequisite: 3613. Plasma phenomenology and their application to practical devices. Devices that relate to microwave power generation. Phase space, distribution functions, momentum transfer, Boltzmann equation, motion of charged particles in electromagnetic waves, hydrogenic electrons, plasmas, pinch effect, etc. Electron beams, klystrons, plasma, traveling-wave amplifiers and oscillators.

4703 Active Filter Design. Lab 2. Prerequisites: 3413 and 3713. Introduction to passive filters; operational amplifiers as network elements; filter specifications; design of active filters. Laboratory design projects and computer simulations.

4713 Network Synthesis. Prerequisite: 4703. Network functions and their reliability, driving-point synthesis, passive and active network synthesis.


5000 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 credit hours.

5030 Professional Practice. 1-8 credits, maximum 8. Experience in application of electrical engineering principles to typical problems encountered in industrial government engineering design and development projects. Solutions to the problems require participation by the student in the role of junior engineer or engineer-intern. Problem solutions involve economics and ecological considerations as well as technology, and must be adequately documented.

5050 Seminar. 1-12 credits, maximum 12. Prerequisite: consent of adviser. Students investigate certain engineering problems not normally covered in existing courses.

5103 Energy Conversion II. Prerequisite: 3113. Dynamic model of rotating electromechanical energy converters in terms of the generalized machine concept. Time-invariant transformations are utilized to reduce the complexity of the model and to obtain the steady-state response.


5123 Engineering Systems Reliability Evaluation. Techniques and concepts needed for evaluating the long-term and short-term reliability of a system. Topics include static and spinning generation capacity, transmission, composite, interconnected, and dc system reliability evaluations; and power system security. Applications to systems other than power systems included. For students with little or no background in probability or statistics.

5153 Direct Energy Conversion. Energy conversion techniques and applications; thermo-electrics, thermionics, fuel cells, MHD and other processes involving electrical, mechanical and thermal energies. State-of-the-art developments in direct energy conversion using sketched papers from journals and other publications. Gives the student a proper perspective of the possibilities and problems associated with satisfying future energy requirements.


5213 Microcomputer System Design. Prerequisites: 3213 and 3313. Design, construction, programming, debugging and documentation of microcomputers interfaced to peripheral devices. Electronics considerations for incorporating different families of IC’s and discrete components. Specialized software to integrate the computer and its peripherals. Experimental opportunities provided.


5253 Digital Computer Design. Prerequisite: 3233. 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 alternatives; input/output interfaces. Same course as COMSC 5253.


5273 Advanced Software Engineering. Lab 2. Prerequisite: 4273. Continuation of 4273. Advanced theory and practice of software design methodology. Large scale design and implementation problems. Experimentation for embedded system engineering. Same course as COMSC 5273.


5353 \textbf{Advanced Power Electronics}. Prerequisite: 4133. Characteristics of high power semicon- ductor devices and the application of such de- vices to power conditioning, inversion, and wave shaping at high power levels.

5363 \textbf{CMOS Analog Integrated Circuit Design}. Prerequisite: 4313. Advanced study of solid-state CMOS line integrated circuits. Topics include: Op Amps, comparators, multipliers, D/A and N/D converters and Op Amp building blocks. Op Amp building blocks include, differential pairs, current mirrors, gain, output stages, and references. VLSI layout and circuit simulation using SPICE.


5513 \textbf{Stochastic Systems}. Prerequisites: 3513 and 4503 or STAT 4033. Theory and applications involving probability, random variables, functions or stochastic processes, including Gaussian and Markov processes. Cor- relation, power spectral density, and nonstationary random processes. Response of linear systems to stochastic processes. State-space formulation and covariance analysis.


5533 \textbf{Modern Communication Theory}. Prerequisite: 5513. Noise as a random process, analog and digital signal detection in the presence of noise, optimization of receiver design using signal space con- cepts and 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 com- puter communication networks.

5543 \textbf{Data Transportation and Protection}. Data and its representation; finite field matrices, pseudo- random sequences; information protection; space division networks; synchronization; and channel and error control.

5553 \textbf{Telecommunications Systems}. Prerequisite: graduate standing. Voice, TV and data commu- nications theory. System level design criteria for NTSC and HD television, ISDN, packet switch- ing, cellular mobile switching, PBX, cable and fiber optics systems, microwave and satellite relay systems.


5623 \textbf{Antenna Theory}. Prerequisite: 3613. Fundamen- tal antenna parameters, including directivity, effi- ciency, radiation resistance, and pattern. Analy- sis of dipole, loop, aperture, broadband, and traveling-wave antennas. Array theory. Introduc- tion to numerical techniques used in modern antenna design.


5653 \textbf{Foundations of Electrodynamics I}. Prerequi- site: 3613. Rigorous derivation of Maxwell's equa- tions utilizing Coulomb's law and postulates of special relativity; the invariance of Maxwell's equa- tions under Lorentz transformations, the four-vec- tor form of Maxwell's equations, scalar and vec- tor potential functions, solutions of the Laplace and Poisson equations, solutions of the homoge- neous and inhomogeneous wave equations with applications to guided waves, radiation and scat- tering.

5713 \textbf{System Theory}. Prerequisite: graduate stand- ing or consent of instructor. Introduction to the theory of deterministic linear and non-linear sys- tems. Applications of matrix methods and vector differential and difference equations to the analy- sis of lumped-parameter electrical networks, me- chanical and fluid systems and discrete-time sys- tems. Computer simulations of system dynamics. Frequency domain techniques in signal and sys- tem analysis using Fourier, Laplace and z-trans- forms. Introduction to stability criteria for nonlinear systems.

5723 \textbf{Nonlinear Systems Analysis I}. Prerequisite: 5713. Failure of superposition; phase plane and phase space techniques; method of perturba- tions, asymptotic, orbital and structural stability; subharmonic generation; generalized approaches to nonlinear systems analysis.

5733 \textbf{Neural Networks}. Prerequisites: 5513, 5713 or equivalent. Introduction to mathematical analysis of networks and learning rules, and on the appli- cation of neural networks to certain engineering problems in image and signal processing and control systems.


5763 \textbf{Digital Signal Processing}. Introduction to discrete linear systems; frequency-domain design of digital filters; quantization effects in digital fil- ters; digital filter hardware, discrete Fourier transforms; high-speed convolution and correlation with application to digital filtering; introduction to Walsh-Fourier theory.

5773 \textbf{Fuzzy Systems Theory and Application}. Pre- requisite: 5723 or MAE 5723. Fuzzy set theory; basic definitions, operations with fuzzy sets and fuzzy relations; extension principle; fuzzy func- tions; possibilistic theory; fuzzy systems; fuzzy models and system identification; approximate reasoning; fuzzy control and stability of fuzzy systems; fuzzy neural networks. Same course as MAE 5773.
Electronics and Computer Technology (ECT)


1104 Fundamentals of Electricity. Lab 3. Prerequisite: MATH 1513. Elementary principles of electricity covering basic electric units. Ohm’s law, Kirchhoff’s law, circuit solutions, network solutions, magnetism, inductance and capacitance.

1223 Electronic Amplifiers I. Lab 3. Prerequisites: 1104, MATH 1715 or MATH 1613. Discrete solid state devices. Study of PN junction and field effect devices in amplifier and other circuits. Elements of biasing, stabilization, feedback and gain determination.

1244 Circuit Analysis I. Lab 4. Prerequisites: 1104, co-requisite MATH 2123. Analysis of AC electric circuits. The use of network theorems and phasors, coupled circuits, resonance, filters, and power.

6505 Control Systems II. 1-3 credits, maximum 6. Prerequisites: 5413 and 5523. 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 Information Theory. Prerequisite: 5513 or consent of instructor. 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 wave-forms for noise immunity. Information transfer in learning 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, optimal adaptive estimation theory, decision theory applied to engineering problems, modulation and detection theory and analysis and processing of seismic data.

6650 Applications of Electromagnetic Theory II. Applications of quantum electrodynamics. Topics of current interest with sufficient mathematical sophistication to equip the student for state-of-the-art research in the area.


6723 Nonlinear Systems Analysis II. Prerequisite: 5723 or MAE 5723. Topics in nonlinear systems theory selected from the current literature. May include nonlinear stability theory, multi-input describing functions, nonlinear feedback control theory, the problem of Lure and Popov’s criterion, multivariable perturbation theory.

6813 Solid-state Techniques. Prerequisite: 5813. Device fabrication; wafer preparation, etching and masking techniques, alloying, bonding, testing, Epitaxial techniques, special topics.

6823 Advanced Optical Techniques. Prerequisite: 5813 or 5853. State-of-the-art optical devices and research methodologies. Investigation and discussion of contemporary developments in nonlinear optical devices and laser applications. Includes both analytical and experimental techniques.

Electrical Power Technology (EPT)

3101 Introduction to Electrical Power. Lab 3. Prerequisites: junior standing and trigonometry. Overview of the electrical industry with selected topics and laboratory to familiarize the student with electrical power systems. Technical language and symbology of the industry; surveying as applied to the needs of electrical power.

3213 Power Systems I. Prerequisites: MATH 2123 and basic electricity. Voltage, current and power relationships in single-phase and polyphase electrical circuits and systems. Power transformers theory, operation, testing, and connections to power systems. Methods of starting and controlling electrical machines.
### Engineering Design with CAD
Lab 2. Introduction to engineering design using modern design methodologies and state-of-the-art computer-aided design tools. Hands-on design, construction, and testing through participation in a design project contest.

### Computer Programming

### Co-op Industrial Practice
- **Industrial Practice (Co-op)**
  - **I.** 1-6 credits, maximum 12. Prerequisites: senior standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.
  - **II.** 1-3 credits, maximum 12. Prerequisites: junior standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.
  - **III.** 1-6 credits, maximum 12. Prerequisites: sophomore standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.

### Control Systems
Control systems in their various conceptual configurations. The application of feedback control theory to present day circuits and systems.

### Element of Control
Lab 3. Prerequisites: 3113, 3123, 3363, GENT 3123. Principles of analog and digital control, with an analysis of feedback control systems in their various conceptual configurations. The application of feedback control theory to present day circuits and systems.

### Advanced Circuits II
Lab 3. Prerequisites: 3123, 3354, 3363, 4314. Active filters, digital signal processing, discrete transforms, and non-linear amplifiers form the element of study. Synthesis of skills and knowledge through implementation of a device of student's design.

### Microwave Techniques
Lab 3. Prerequisites: 3113, 3354, GENT 3123. Communication principles and measurement techniques in the UHF and microwave spectrum, coaxial and waveguide transmission lines, antenna systems and signal transmission, modulation and detectors, oscillators and amplifiers, introduction to signal transmission and modulation methods.

### 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 or device through design, assembly, test and demonstration phases.

### Engineering Science (ENGSC)

#### 2112 Statistics
Lab 2. Prerequisites: PHYS 2014 and MATH 2145. Resultants of force systems, static equilibrium of rigid bodies and statics of structures. Shear and moment diagrams.

#### 2122 Elementary Dynamics
Prerequisite: 2112. Kinematics and kinetics of particles, systems of particles, and rigid bodies from a Newtonian view-point utilizing vector algebra and calculus. Work energy and impulse momentum principles.

#### 2142 Strength of Materials
Prerequisite: 2112. Bending moments, deformation and displacements in elastic and plastic deformable bodies.
1313 Critical Analysis and Writing I. Prerequisites: English ACT score of 30 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 30 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.

2333 Introduction to Technical Writing. Prerequisite: 1113. Does not meet any part of the six-hour composition requirement for the bachelor's degree. Technical literature and publications in the student's area of specialization. Emphasis on clarity, simplicity and careful organization.

2413 (H)Introduction to Literature. Fiction, drama, film and poetry. Written critical exercises and discussion.

2443 Languages of the World. A comprehensive survey of world languages. The essential structural and historical organization of languages. The process of languages as a basic human function. Same course as FLL 2443.

2513 Introduction to Creative Writing. Literary composition with emphasis on techniques and style through readings and writings in fiction, poetry and drama.

2543 Survey of British Literature I. The beginnings through the Neo-Classical Period.

2653 Survey of British Literature II. The Romantic Period to the present.

2773 Survey of American Literature I. The Puritans through the Romantic Period.

2883 Survey of American Literature II. The Romantic Period to the present.

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,SpD)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 (H,SpD)World Literature I. Selected literary masterpieces exemplifying ideals and values in Western cultures.

3173 (H,SpD)World Literature II. Selected literary masterpieces exemplifying ideals and values in non-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.

3240 Criticism. 3 credits. maximum 6. Study and application of principal critical theories in literature, film or technical writing.

3323 Technical Writing. Prerequisites: 1113, 1213, 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 1213 with an "A" or "B" in 1113 and consent of the 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 (H) British Literature to 1600. Historical development. Major writers and their works.

3632 (H) British Literature 1600-1800. Historical development. Major writers and their works.

3643 (H) British Literature 1800-1900. Historical development. Major writers and their works.

3653 (H) 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.

4063 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 (H) Aesthetics of Film. Major theoretical approaches to the art of cinema: auteurism, semiotics, structuralism, historicism.

4303 (H) British Drama 1500-1660. Genre development. Major writers and their works.

4313 (H) British Drama 1660-1800. Genre development. Major writers and their works.

4323 (H) British Drama Post 1800. Genre development. Major writers and their works.

4333 (H) American Drama. Genre development. Major writers and their works.

4403 (H) American Poetry to 1900. Genre development. Major writers and their works.


4435 (H,SpD) Contemporary Literature. Genre development. Major writers in the novel, poetry, or drama and their works.

4520 Problems in English. 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.

4553 Document Design. Prerequisite: six credit hours of English, including 3323. Design theories and practice for hard copy, computer screens and visuals. Students will learn about design standards, page layout, instructional design, desktop publishing, typography, reading theory, and current research in visual design.

4563 (H,SpD) Scientific and Technical Literature. Prerequisite: 6 credit hours of English. Scientific and technical style.

4633 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)Milton. 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,SpD)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 (H,SpD)Literature by Women. The collection of literature written by women in England and America, classical and modern figures.


4853 (H)American Novel to 1900. Genre development. Major writers and their works.


4933 (H,SpD)Minority, Ethnic or Regional Literature. The study of minority, ethnic or regional American literature. Topic varies by semester.

4973 Issues in English: Technical Writing. Prerequisite: senior standing. A capstone course for technical writing majors. Issues and professions related to the degree.

4983 Issues in English: Literature. Prerequisite: senior standing. A capstone course for English literature majors. Issues and professions related to the degree.

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 student's 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 Hamlet, 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, maximum 6. Selected topics in teaching English as a second language; e.g. cross-cultural communication, materials preparation, bilingual education.

5123 Social and Psychological Aspects of Language. An introduction to language acquisition, processing, and production, and their interaction with social contexts.

5130 Studies 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.

5143 Seminar in Descriptive Linguistics. An introduction to phonology, morphology, syntax and semantics.

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 Modern Literature. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of modern literature.

5520 Internship in Technical Writing. 1-6 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.

5563 History of Scientific and Technical Literature. Structural, stylistic and rhetorical analysis of selected scientific and technical works.

5573 Theories of Communication. Survey of a broad range of theories of communication and application of those theories to technical communication.

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.

5680 Seminar in Contemporary Literature. 3 credits, maximum 6. Selected writers and their works, themes and literary developments in contemporary literature.

5730 Seminar in Fiction Writing. 3 credits, maximum 6. Writing fiction at the professional level.

5740 Seminar in Poetry Writing. 3 credits, maximum 6. Writing poetry at the professional level.

5750 Seminar in Scriptwriting. 3 credits, maximum 6. Scriptwriting at the professional level.

5990 Special Problems. 1-3 credits, maximum 6. Investigation into a designated area of English leading to material for creative component option (M.A.). Graded on a pass-fail basis.
Entomology (ENTO)

2003

2023
Introduction to the Science of Entomology. Lab 2. Basic structure, function and classification of insects and closely related animals. Coverage of insects in ecosystems and development of control programs that reduce reliance on chemical pesticides.

2653
Insect Behavioral Ecology. Lab 2. Prerequisites: 2023 or consent of instructor. Principles of insect responses to stimulation with emphasis on behaviors related to mating, feeding on plants or animals and to environmental conditions. How these responses affect insect density and distribution.

5000

6130
Studies in Fiction Writing. 3 credits, maximum 6. Prerequisite: 5730. Individual projects in fiction.

6140
Studies in Poetry Writing. 3 credits, maximum 6. Prerequisite: 5740. Individual projects in poetry.

6150
Studies in Scriptwriting. 3 credits, maximum 6. Prerequisite: 5750. Individual projects in scriptwriting.

2110
Seminar or Directed Study. 1-6 credits, maximum 9. Specialized readings or independent studies.

6220
Seminar in Genre. 3 credits, maximum 9. The development, traditions, concerns or characteristics of genre in selected texts. Major genres and subgenres considered.

6230
Studies in Poetry. 3 credits, maximum 6. Selected work in poetry, for example modern poetry and contemporary poetry.

6240
Studies in Drama. 3 credits, maximum 6. Selected work in drama, for example American, British, Tudor-Stuart, pre-Shakespearean.

6253
Studies in New Media. Selected work in new media, for example film, literary adaptation to film, film and television.

6260
Studies in Literary Criticism. 3 credits, maximum 9. Selected work in literary criticism, for example ancient and neo-classical, 19th century, 20th century.

6410
Topics in Linguistics. 3 credits, maximum 9. Prerequisite: 5143. Study of advanced topics in linguistic theory and research.

6420
Topics in Second Language Acquisition. 3 credits, maximum 9. Prerequisite: 5243. Study of topics in second language theory and research.

6500

6913
Pesticides in the Environment. Prerequisites: BIOL 1403, CHEM 1225. A discussion of pesticides (chiefly fungicides, insecticides, herbicides and nematocides), including potential movement, degradation, fate and significance in the environment.

5000

5003
Insect Biochemistry. Prerequisite: consent of instructor. Biochemical processes in insects and closely related arthropods with emphasis on metabolic pathways unique to this group. Biochemical aspects of arthropod host interactions.

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: one course in organic chemistry and nine credit hours of biology. Functions of the organ systems of insects. Lecture-demonstrations of selected insect physiology techniques. Same course as 5043.

3331
Insect Pests of Agronomic Crops. Lab 2. Prerequisite: 2023 or concurrent enrollment. Sampling and decision-making processes for evaluation and control of insect pest populations in agronomic crops. Coverage of identification of pests and beneficials and damage symptoms resulting from insect feeding in crops.

3421
Horticultural Insects. Prerequisite: 2023 or concurrent enrollment. Identification, biology and control of pests attacking horticultural crops. Emphasis on pests injurious to vegetables, fruits, pecans, greenhouse plants, turf and ornamental trees and shrubs.

3463
Forest Insects. Lab 2. The biology and control of insects injurious to shade tree, forest and forest products.

3644
Insect Morphology. Lab 4. Prerequisite: 2023. Insect development and comparative morphology. Same course as 5644.

3883

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
Ecological Methodology. Lab 2. Prerequisites: one course each in ecology and statistics. Methods of estimating animal and plant population parameters, species diversity, community parameters, niche concepts and diet analysis.

4464

4523
Issues Related to Plant Production Systems. Lab 2. Prerequisites: senior standing; minimum of 12 hours in agronomy, entomology or horticulture. Ecological, economic and social issues related to plant production systems. Resource management for profitable and sustainable production while maintaining environmental quality.

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.

5000
Environmental Science (ENVIR)

1113 Elements of Environmental Science. Application of biology, chemistry, ecology, economics, geology, hydrology, mathematics, physics, and other agricultural sciences to environmental issues. Addressing environmental problems from the standpoint of ethics, risk, and scientific and social feasibility. Emphasis on agricultural systems and natural resources.

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 of reports.

6000 Research for Dissertation. 1-12 credits, maximum 24. Prerequisite: approval of advisory committee and departmental steering committee. Research leading to the Ph.D. dissertation.

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 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.

2100 Preprofessional Laboratory Experience. 1-4 credits, maximum 4. Lab 2-8. Realistic experiences in different professional career areas, acquainting students with the diversity of responsibilities as applied to the variety of audiences served.

2113 (S)Human Development Within the Family: A Lifespan Perspective. Human development within the family described from a lifespan perspective. The principles of development and dynamics of behavior and relationships.

2213 Human Sexuality and the Family. Sexual development emphasizing personal adjustment and interaction with family and culture.

2413 Resource Management for Individual and Family. Principles and procedures of management and their relationships to human and material resources. Emphasis given to the consumer in the marketplace, financial management and time and energy management.

2613 The Professional in Individual, Family and Community 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)Early Adulthood. Study of the unique characteristics of development during early adulthood. Theories of adult development with emphasis on application to program development and providing services for adults.

3023 Child and Parent in Social Context. Parenting philosophies and styles; programs for children, families, and caregivers; emphasis on effective ways for the home, school, workplace and community to work together to provide for optimum development of children of various cultures and ethnic groups.

3112 (S)Parent-Child Relationship. For parents, teachers, or others who expect to be responsible for young children. Increases understanding of the needs and feelings of both the developing child and the adult caregiver. A wide variety of philosophies and techniques explored and concerns of individual can devise their own comfortable, effective parenting styles.

3143 (S)Marriage. Consideration of courtship and marriage with special emphasis on building a healthy paired relationship; communication and decision making; and coping with such problems as money, sex, role taking, in-laws and children.

3213 (S)Social, Emotional and Language Development in Early Childhood. Study of appropriate experiences in social, emotional, and language development.

3220 Early Field Experiences. 1-4 credits, maximum 4. Decision-making, priority-setting, and self-assessment. Participation in Child Development Laboratories, public schools or family services.


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, Play and Motor Skills in Early Childhood. Prerequisite: course in child development. Consideration of appropriate experiences in the areas of play, art, music, and motor skills for children under six. Observation and participation with children in the Child Development Laboratories and other groups.

3333 (S)Child Development and Guidance: Adolescence. Development of the adolescent physically, socially, intellectually and emotionally with emphasis on the search for identity, sexuality, vocational choice and interpersonal relationships. Observation of adolescents.

3403 Literature and Literacy in Early Childhood. Prerequisite: 3313 or equivalent. Consideration of appropriate experiences in the areas of literature and language arts.

3413 (S)Family Economic Decision Making. Helping individuals make more effective choices as consumers. Relevant concepts, theories, and research from economics, family economics, marketing, and statistics. Information-imperfect markets, assessing consumer information, seeking new and better skills for children under six. Observation of families.

3423 Technology and the Home. Lab 2. Selection, use and application of equipment in the home, including microcomputers and other technologies for management of the home.

3433 Family Finance. Prerequisite: junior standing. Problems faced by consumers in the changing economy, impact of family financial decisions on a consumption-oriented society. Management of family resources including financial planning, credit, insurance, savings, investments, tax and estate planning.

3503 Cognitive Development in Early Childhood. Prerequisite: 2113 or equivalent. Study of major theories of cognitive development. Application to appropriate experiences in physical and natural sciences, mathematics and social studies.

3613 Professional Services for Children and Families. Study of current major issues and selected services for children and families.
3623 Fundamentals for the Helping Professional. Prerequisites: 2613, 3613. Development of fundamental skills and techniques used by those in various helping professions as viewed from the systems theory perspective. Observation and interviewing techniques, problem-solving and advocacy skills, and introduction to grant writing.

3753 (S) Family Development. Relationships over the life course within the American family. Variations in form and function of the family system related to cultural, economic, and social contexts.

3810 Practicum in FRCD. 1-9 credits, maximum 9. Prerequisites: 3213 and 3233, or 3613 and 3623. Observation and participation in programs for children, youth, adults and families. Supervision by FRCD faculty members or their designated representatives.

4000 Senior Thesis. 1-6 credits, maximum 6. Prerequisites: 4743, STAT 2013, senior standing, consent of instructor. Supervised research for the bachelor's degree.

4102 Philosophy of Home Economics Education. Basis 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 contemporary issues in public education.

4103 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.


4123 Observation and Assessment of Family Interaction. Examination of family interaction through observation and assessment techniques. Focus on whole family functioning and the functioning of multiple family relationships.

4133 Organizing and Administering Programs for Families and Individuals. Development, management, and evaluation of programs serving families and individuals.

4203 Strategies for Teaching. Learning theories and strategies for planning, teaching and evaluating formal and nonformal programs. Not applicable for teaching licensure.

4212 Extension Programs in Home Economics. Development, organization and methods of home economics public service programs.

4213 Media, Materials and Techniques in Home Economics Education. Lab 6. Prerequisites: 3313 and full admission to University Teacher Education. Application of educational principles to specific home economics subject matter. Experiences with verbal and nonverbal communication, teaching and evaluation techniques, audiovisual materials, computers and a variety of teaching aids. Development of proficiency in use of various media.

4252 History and Philosophy of Early Childhood Education. Prerequisites: courses in child development and early childhood education and senior standing. History of early childhood education; theoretical foundations and methods of early childhood curriculum models, including multicultural and nonsexist approaches; and current major issues in early childhood education.

4333 Organization of School and Community Home Economics Programs. Prerequisite: full admission to teacher education. Leadership responsibility and activities of the home economics teacher in youth organizations, adult education, and effective interaction with parents and community.

4353 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.

4413 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.

4420 Internship in Early Childhood Education. 1-7 credits, maximum 7. Lab 3-21. Prerequisites: 3213, 3233, 3303, 3403, 3503, full admission to Teacher Education, and pre-registration with consent of the director of the Child Development Lab. Teaching experience as appropriate for students in early childhood education option. Graded on a pass-fail basis.

4423 Family Resource Management. Analysis of the time, human, environmental and financial resources of the family. Practical application of management principles in the development and utilization of family resources. Emphasis on professional competence.

4453 (S,Sp,D)Women in the Economy. Prerequisites: 2413, ECON 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.


4523 Critical Issues in Family Relations and Child Development. Prerequisite: senior standing. An examination of the place of family relations and child development in the context of broader themes. An exploration of the students' specialization and its implications for an educated life.

4533 (S)Adulthood: Middle Years. Study of the unique characteristics of life between young adulthood and the later years. Special emphasis on physical, intellectual, personal, family and career development in middle age.

4543 (S)Adulthood: Later Years. Analysis of the aging process. Interrelation between physical, psychological and social development in later years. Special emphasis on multigenerational family issues and relationships.

4553 Families in Crisis. Study of family responses to normative and unpredictable stress. Emphasis on using current literature on selected family stressors to identify and solve family problems. Supervision and observation and participation in programs for individual, family, and community services.

4610 Internship. 1-8 credits, maximum 8. Lab 4. Prerequisites: 2100, 2613, 3613, 3623; completion of application form requiring consent of adviser or consent of instructor. Supervised observation and participation in programs for individual, family, and community services.

4663 Theories and Issues in Child Development. Prerequisites: 2113; six additional hours in FRCD, or demonstration of interests and issues related to child development; theories and philosophical bases underlying development.

4673 (S) 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.

4720 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 philosophy and competencies in home economics education through directed teaching experience in an approved vocational program. Participation starts at the beginning of the semester in the assigned school. Graded on a pass-fail basis.

4743 Fundamentals of Research Methodology in Family Relations and Child Development. Prerequisite: STAT 2013 or equivalent. Understanding research processes and development of skills needed to be consumers of scientific literature in FRCD. Practice in reading research and statistics, introduction to how computers are used in this research and demonstration of basic principles of assessment in children and families.

4750 Special Problems in FRCD. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Various units of work related to specific issues in family relations and child development.

4773 (S,Sp,D) The Family: A World Perspective. Family structure and interaction that transcend specific cultural and international family forms, their social issues and relevant services to meet their needs.

4811 Seminar in Family Services. Pre-employment seminar. Individual competencies related to family services, career options, and the process of seeking employment.

4823 Family Life Education. Philosophy and principles of family life education. Planning, implementation, and evaluating family life education programs in community and education settings.

4850 Special Unit Courses in Family Relations, Child Development and Early Childhood Education. 1-8 credits, maximum 6. Various units taught by specialists in the field.

5000 Master's Thesis. 1-6 credits, maximum 6. Research in FRCD for M.S. degree.

5110 Directed Study in FRCD. 1-9 credits, maximum 9. Prerequisites: 5223; 5253. Directed individual study in child, youth, and adult development and family sciences.
5363 Early Childhood Theory, Practice and Evaluation. Prerequisites: 5213, 5223 or consent of instructor. Curriculum development and program modification for children under six emphasizing individual differences, equipment and materials, physical facilities and space, teacher roles, and philosophical objectives.

5373 Early Childhood Administration, Policy Analysis, and Advocacy. Prerequisite: 5213, 5223 or consent of instructor. Examination of the administration of programs for young children as well as policy evaluation and advocacy. Legal, social and economic conditions as they affect the welfare of individuals and families.

5413 Human Ecology of the Family. 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 Research Literature in Gerontology. Current research knowledge related to gerontology and the aging process. Critical study of classic and current research.

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.

5513 Issues in Family Science. Current and classic literature in family studies. Consideration of philosophical bases and current research issues relevant to the family as a field of study.

5523 Theoretical Frameworks in Family Science. Prerequisite: 6 credit hours at graduate level in child development or related areas. Major theories and supportive research that contribute to the understanding of child behavior and development.

5543 Coping with Family Crises. Strategies for helping families deal with various family crises including illness, death and divorce. Focus on dealing with these from a family systems approach.

5643 Models and Strategies in Marriage and Family Therapy. Exposure to the dominant models used in marriage and family therapy. Emphasis on theoretically appropriate strategies of treatment application to the treatment of couples and families from an ecosystemic perspective.

5653 Diagnostic Assessment in Marriage and Family Therapy. Prerequisite: 5623; admission to marriage and family therapy specialization or consent of instructor. Recognition of the most relevant dimensions 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.

5663 Professionalism and Ethics in Marriage and Family Therapy. Prerequisites: graduate standing and consent of instructor. The development of the professional attitude and identity of a marriage and family therapist. The AAMFT Code of Ethics, family law, ethnicity, and gender issues, as related to the practice and profession of marriage and family therapy.

5743 Management of Family and Community Service Programs. Prerequisites: graduate standing and one year work experience. Planning, personnel development, resource development, management and evaluation of community service.


5753 Promoting Community Service Programs. Strategies for promoting participation and community support for non-profit programs. Applications to the promotional problems of organizations.

5813 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.

5823 Consumer Economics. Prerequisite: graduate or senior standing. Application of economics theory and principles toward solution of problems of the individual and family unit using price theory concepts. Means by which scarce resources satisfy competing ends and allocation of limited resources for household purchases with budget restraints.

5833 Family Financial Security. Prerequisite: 3433 or consent of instructor. Socioeconomic changes, public policies and programs and management practices related to financial well-being.

5843 Family 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 areas such as income maintenance, housing, health and education, social services, employment and contract law.

5863 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.
5930 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.

5933 Evaluation Design. Fundamental principles of evaluation, emphasis on instrumentation.

5953 Home Economics in Higher Education. Educational objectives and their implementation in home economics at the upper-division and graduate level.

6000 Doctoral Thesis. 1-12 credits, maximum 30. Prerequisite: consent of major professor. Research in home economics for the Ph.D. degree under supervision of a graduate faculty member.

6110 Research Internship. 1-9 credits, maximum 9. Prerequisite: consent of instructor. Special research studies under the supervision of a graduate faculty member.

6133 Advanced Research Methods in Family Relations and Child Development. Prerequisites: 5213, 5223 or consent of instructor. Research in research methods and one in statistics. Research design and analysis of data appropriate to the areas of family relations and child development.

6190 Research Internship. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special research studies under the supervision of a graduate faculty member.

6223 Analysis and Application of Child Development Theory. Prerequisite: 5223. Critical analysis of selected child development theories using primary source material with demonstration of application to development, research and practice.

6243 Theory and Research in Early Cognitive Development. Prerequisites: 5213, 5223 or consent of instructor. Critical examination of the concepts and principles derived from cognitive development research with special emphasis on research and methodological literature.

6250 Seminar in Child Development. 1-6 credits, maximum 6. Prerequisite: 5213 or equivalent. Selected topics in child development with special attention given to recent research literature and current theory.

6253 Theory and Research in Early Social Development. Prerequisites: 5213, 5223 or consent of instructor. Research and theory pertaining to social and emotional development, including attachment, social interaction, friendships and temperament.

6363 Theories and Research in Early Communication Development. Prerequisites: 5213, 5223 or consent of instructor. Recent theories and research in language communication development, including receptive and active language and the relationship of language to early social and cognitive development.

6373 Theory and Research in Developmental Disabilities. Prerequisites: 5213, 5223 or consent of instructor. Recent theories and research related to developmental disabilities, including both physical and mental handicapping conditions and their impact on human development.

6523 Analysis and Application of Family Theory. Prerequisite: 5523. Family theory process, including logic, theory construction, and relating conceptual orientations to current research areas.

6580 Seminar in Family Sciences. 1-6 credits, maximum 6. Prerequisite: 5513 or consent of instructor. Current research and theory in the family area; selected topics.

6743 Program Design and Implementation. Theoretical bases, strategies and issues for bringing about change in groups and individuals applied to home economics and community services programs.

6823 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.

6843 Economic and Social Foundations of Family Economics. Prerequisites: graduate standing, consent of instructor. Theories and social and economic trends and policy affecting resource use in household, consumer and leisure activities and the resulting quality of life.

6933 Advanced Evaluation Research. Prerequisite: 5103 or consent of instructor. Process of evaluation related to research purpose and design and to assess evaluation research models appropriate to home economics.

6943 Administration of Home Economics. Principles, processes, techniques and issues in relation to administration.

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. Operational and strategic financial management strategies for corporations. Designed to develop 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.

4213 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.

4453 Bank Decision Simulation and Analysis. Prerequisite: 4443. Student teams assume the roles of senior bank officers, making decisions regarding bank assets, funding, product pricing, financial leverage, profit enhancement, risk management, and staffing. Decisions implemented through computer simulation, incorporating the decisions into an environment where the decisions of competing management teams and the local economy determine bank profitability and shareholder value. Evaluation of students' abilities to create shareholder value and effectively communicate planning and analysis through written and spoken reports.

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: 3113. Elements of corporate risk control and management.

4813 Portfolio Management. Prerequisite: 4223. 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 to understand the controlling of problems, trends, and theory of portfolio management.

5213 International Business Finance. Prerequisite: 5333. Theories and financial management practices unique to business firms which operate in, or are influenced by, an increasingly global economy.

5223 Investment Theory and Strategy. Prerequisite: 5333. Selected investment topics and advanced portfolio management techniques.
5243  
Financial Markets. Prerequisite: 5353. An analysis of the structure of financial markets, the determination and behavior of interest rates, the functioning of and the flow of funds.

5550  
Special Topics in Finance. 1-6 credits, maximum 6. Prerequisite: 5353. Theoretical and applied aspects of specialized financial areas. Evaluation of models, current trends and problems.

5613  
Corporate Financial Planning. Prerequisite: 5353. Financial planning in a systems framework. An integration of existing financial theory and practice. Financial planning systems allowing the manager to acquire an overview of the various functions of the firm; to examine alternative courses of action with speed and thoroughness; to reduce the response time in reacting to change in the environment and to improve future decisions by learning from feedback of previous decisions.

6513  
Theory of Finance. Prerequisite: 5353. Development of the theoretical structure of financial decisions beginning with case of certainty and moving to uncertainly models. Fundamental decisions of investment, financing, and production within the context of economic theory of choice and capital market equilibrium.

6660  
Seminar in Finance. 3-6 credits, maximum 12. Prerequisite: consent of instructor. Advanced research with emphasis on theoretical problems and solutions. Selected topics covered.

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/or life. Safe storage, transportation and handling practices to eliminate or control the risk of fire in the home, business and industry.

1373  
Fire Suppression and Detection Systems. Lab 3. The design, installation, maintenance and utilization of portable fire-extinguishing appliances and pre-engineered systems. Operational capabilities and utilization requirements of fire detection and signaling systems. Fire detection and suppression applied in practical laboratory problems.

1413  

2013  
Electrical Safety Codes. Lab 3. Prerequisites: ECT 2213, MATH 1613. Safety-oriented design, installation, operation and maintenance of electrical power distribution systems based on current electrical codes and safety standards.

2023  

2153  
Fire Protection Management. Prerequisite: prior or concurrent enrollment in all other fire protection courses. Applied human relations, technical knowledge and skills for achieving optimum effectiveness from a fire protection organization.

2243  
Design and Analysis of Sprinkler Systems. Lab 3. Prerequisites: 1373, 2483. Detailed current standards for selection, design, installation, operation and maintenance of automatic fire suppression systems. Laboratory problems on applicable technological principles.

2344  
Elements of Industrial Hygiene. Lab 3. Prerequisite: CHEM 1225. Toxic or irritating substances, physical, biological, ergonomic and other occupational factors causing employee illness or discomfort. Environmental pollution sources and controls.

2483  

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 assistances through use of existing design programs.

3143  
Structural Designs for Fire and Life Safety. Lab 3. Prerequisites: 1213, 1373, 2243. Building construction standards and codes to assure maximum life and property safety from fires, explosions, fire and natural disaster. Egress, piping, specifications, occupancy and construction classifications and fire protection requirements for building construction and materials.

3222  
Industrial Security Applications. Safeguarding of industrial property, personnel and proprietary information.

3233  
Radiological Safety. Lab 2. Ionizing radiation problems; detection and measurement, shielding and exposure limiting, radiation health aspects, storage, handling and disposal.

3684  
Industrial Loss Prevention. Lab 3. Prerequisites: 1213, 1373, 2483 and 3013; corequisite: ENGL 3323 or consent of instructor. Specific industrial processes, equipment, facilities and work practices for detecting and controlling potential hazards.

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  
Special Problems in Loss Control. 1-4 credits, maximum 6. Prerequisite: consent of department head. Special technical problems in fire protection and safety.

4133  
Industrial Hygiene Instrumentation. Lab 3. Prerequisites: 2344, CHEM 1225, PHYSYC 1114. Description, operation and application of quantitative instruments in general use in industrial hygiene.

4333  

4403  

4993  
Advanced Fire and Safety Problems. Prerequisites: prior or concurrent enrollment in all other required FIRET courses. 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.

Foreign Languages and Literatures (FLL)

The Department of Foreign Languages and Literatures offers courses under the prefix FLL, and in the following languages each of which has its own prefix: Chinese, French, German, Greek, Japanese, Latin, Russian and Spanish. These languages are listed in alphabetical order.

1000  
Special Studies in Foreign Languages and Literatures. 1-10 credits, maximum 10. Special studies in areas not regularly offered; basic level.

2000  
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  
Languages of the World. A comprehensive survey of world languages. The essential structural and historical organization of languages. The process of language as a basic human function. Same course as ENGL 2443.
Forestry (FOR)

1123 Elements of Forestry. Lab 3. Survey of forestry as an art, science and profession including forestry and natural resource management theory, forest resource distribution and ownership, historical development, administrative agencies, forest protection, wildlife interactions, forest recreation, and career opportunities; lab fieldwork in wood science, tree identification, land and tree measurements, and mapping. One required three-day field trip.

1211 History and Issues of Forest Policy. Introduction to forest resources policy development in the United States and the effects of policy on the administration and management of forest resources. Discussion of policy implications of some current resource management issues.

2003 Forest Mensuration I. Lab 3. Prerequisites: 1123; MATH 1715 (or MATH 1513 and 1613); STAT 2013 (or concurrent). An introduction to the measurements of forests, forest products, standing trees, growth, and the application of mensurational techniques to timber valuation and analysis. Measurement techniques of non-timber components of forest resources.

2134 Hydrology. Lab 4. Prerequisite: BIOL 1403 or concurrent enrollment. Identification, taxonomy and distribution of forest trees and shrubs of the United States; their environmental requirements and utilization.

3001 Multiple Use and Values of Forest Resources. One-week segment of a nine-week summer field course. Use, values and management of forests and associated natural resources including wildlife, watershed, recreation, range, wilderness, minerals and timber. Visitations to natural resource agency lands and projects. (Condensed laboratory course taught as a one-week summer field course.)

3003 Forest Mensuration II. Prerequisite: 2003. Three-week segment of a nine-week summer field session. Field study emphasis on use and care of measurement equipment, the statistical and physical principles of forest mensuration, and special topics in individual tree and stand-level mensuration. (Condensed laboratory course taught as a three-week summer field course.)

3012 Timber Harvesting and Wood Utilization. Two-week segment of a nine-week summer field session. Overview of timber harvest systems, methods, equipment, and planning, including topics in timber procurement, timber sales, harvest economics, logging safety, environmental considerations, and industrial operations. Forest products processing, manufacturing, and marketing. Tours to logging operations and production facilities. (Condensed laboratory course taught as a two-week summer field course.)

3103 Silvics and Field Silviculture. Prerequisites: 2134; BIOL 1403. Three-week segment of a nine-week summer field session. Field study of forest ecological relationships; examination and measurement of site productivity and stand dynamics; natural role and behavior of fire in forest ecosystems; use of fire as a management tool and control of wildfire; concepts of forest watershed management; examination of silvicultural practices in major forest types of North America. (Condensed laboratory course taught as a three-week summer field course.)

3213 Forest Ecology. Lab 3. Prerequisites: BIOL 1304 and 1403 or consent of instructor. Study of the forest ecosystem, its structure and function, physical environment, biotic component and change over time and its management implications. Two weekend field trips required.

3223 Silviculture. Lab 3. Prerequisite: 3213. Principles and techniques of natural and artificial regeneration, intermediate cultural treatments, and silvicultural systems applicable in various forest cover types. Two-day field trip may be required.

3443 Forest Genetics and Tree Improvement. Prerequisite: 3213. A study of mechanisms of inheritance, types of genetic variance, the development of natural populations, variation patterns, genetic improvement systems, and forest tree improvement methods as part of forest and nursery management systems.


3643 (N,Spd)Forest Environmental Science. Overview and analysis of forests, their related environments, their associated natural resources, and their tangible and intangible values, emphasizing basic principles of scientific forest management, the use of forest resources by society, natural resource administrative systems. Emphasis on current issues in forestry. No credit for forestry majors.

3663 Forest Biometrics. Lab 2. Prerequisites: 3003; MATH 2103. 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.

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 wildland settings.

(N) Forest Watershed Management. Prerequisite: senior standing. Hydrologic processes and characteristics of forest watersheds, effects of forest practices on water quantity and quality, management techniques for improving and protecting water resources, measurement techniques for obtaining hydrologic data. One required field trip.

Research and Thesis. 1-6 credits, maximum 6. Open to students working for a Master of Science degree in forest resources.

Productivity of Forest Stands. Lab 2. Prerequisite: 3223, AGRON 2124, STAT 5015 or equivalent. Integrated study of the ecological, and genetic factors controlling the productivity of forest stands. Analysis of natural, economic and social factors influencing silvicultural treatment of forest stands. Tree and stand response to silvicultural manipulation.

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.

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.


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.

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.

Forest Genetics. Prerequisites: 3443 and ANSI 3423 or AGRON 3553. 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.

Forest Tree Breeding. Prerequisite: 3443. The application of silvicultural and genetic principles to the commercial production of genetically improved forest trees.

Land Use and Water Quality. Prerequisites: a basic hydrology class, general chemistry. Nonpoint source pollution; relationships between land use and water quality with an emphasis on forestry, mined land, agriculture, and urban land uses. Focus on current research.

French (FRNCH)

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.

Elementary French II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1115.

Accelerated Intermediate French. Prerequisite: departmental placement test. Rapid overview of basic French grammar. Designed for incoming first-year students with enough previous French to test out of 1115, but not ready for second-year courses.

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.

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.

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.

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.

French for Reading Requirements. Prerequisite: graduate standing or consent of instructor. Translation of French readings into English.

(French Conversation. Prerequisite: 20 hours of French or equivalent. Colloquial speech, with discussion of French newspapers and magazines. Practice in brief public address in French.

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.

Advanced Grammar. Lab 1. Prerequisite: 20 hours of French or equivalent. Applied French for students in commercial and technical fields. Overview and strategies of business and economic climate in France.

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.

Introduction to Analysis of French Literature. Prerequisite: 20 hours of French or equivalent. Close reading of shorter texts in a variety of literary genres, with presentation of French versification and literary terminology.

Orientation to Internship Abroad. Prerequisite: 12 hours of French or equivalent proficiency. Preparatory course for summer practicum in French-speaking country.

Internship Abroad. Prerequisite: 3902. Practical studies in a French-speaking country. Supervised research papers and reports, and oral testing, during and following the practicum.

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.

History of French Literature I. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature before 1700, with reading of representative texts.

History of French Literature II. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature of the eighteenth century, with reading of representative texts.

History of French Literature III. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature of the nineteenth century, with reading of representative texts.

History of French Literature IV. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature of the twentieth century, with reading of representative texts.

Backgrounds of Modern French Civilization. Prerequisite: 20 credit hours of French or equivalent. Capstone course.

Directed Studies in French. 1-3 credits, maximum 9. Lab 1-2. Prerequisite: 20 credit hours of French or equivalent. Individual or group study of French language or literature.

Modern French Theater. Prerequisite: 20 credit hours of French or equivalent. Analysis of French plays from the 19th and 20th centuries.

Advanced Studies in French. 1-3 credits, maximum 9. Prerequisite: 15 credit hours of upper-division French. Discussion or research in specialized topics.

General Administration (GENAD)

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 nonprofit consumer organizations in the personal and family financial planning and decision making, including budgeting, savings and investments, credit, buying problems and insurance.
Administrative Strategies for Women in Business. Identification and analysis of the theoretical concepts and practical tools enabling a woman to demonstrate effectiveness in the business environment. Changing advancement opportunities for women, clarification of career goals, conflict management, delegation of authority, division of labor, decision making, motivation, supervision and analysis of executive styles.

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. Prerequisite: completion of an authentic 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. Prerequisites: 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.

General Technology (GENT)


1153 Engineering Design Graphics with CAD. Lab 6. Sketching and using CAD system to generate engineering drawings to ANSI standards. Interpretation of typical industrial drawings. Students with two years high school or one year practical ANSI drafting/CAD may substitute an advanced course in design technology with consent of their advisers.


1320 Technological Problems. 1-3 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. Prerequisites: consent of instructor and adviser. Problems in applied engineering science that are of particular interest to the engineering technician.

2321 Statics. Prerequisites: MATH 1613 and PHYS 1114. Forces 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: completion of three semesters’ 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.

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.

3123 Applied Analysis for Technology. Prerequisite: MATH 2133 or equivalent. Applications of elements of matrix algebra, ordinary differential equations, and infinite series to problems in engineering technology.

Genetics (GENE)

5102 Molecular Genetics. Prerequisites: BIOCH 3653 or BIOL 3014 and one course in genetics or consent of instructor. An introduction to molecular genetics on the graduate level.

Geography (GEOG)

1113 (S) 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.

1114 (L,N) Physical Geography. Distribution and analysis of natural features of the earth. Landforms, soils, minerals, water, climates, flora and fauna. Emphasis on human-environment relations where appropriate. No general education credit for students also taking GEOL 1014.

2253 (L,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.


3033 (N,SpD) Meteorology. Physical elements which cause and influence weather.

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.

3133 (S,SpD) 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.

3143 (S) 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.

3153 (S,SpD) Conservation of Natural Resources. Problems and corrective methods of conservation of land, water, forests, wildlife, minerals and people.

3163 (S,SpD) 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.

3173 (S) Cultural Geography. Geographic impact of human cultures. Emphasis on the concepts of social space, density, crowding, territoriality, diffusion, migration, environmental perception and cultural landscape.

3313 Cartography. Lab 2. Prerequisite: junior standing. Theory, design, and effective portrayal of data on maps.

3333 Spatial Analysis. Prerequisite: STAT 2013. The utility and goals of geographic inquiry in the solution of problems including concepts of spatial structures, distributive processes, networks, interactions and areal associations.

3703 (S) Geography of Oklahoma. Geographic interpretation of physical, economic, historical and scenic features.

3713 (S) Geography of the United States and Canada. A geographic analysis of the United States and Canada with emphasis on regional variations of social, economic and physical phenomena.

3723 (I,S) Geography of Europe. Location and analysis of natural, economic and cultural features of Europe.

3733 (I,S) The Former Soviet Bloc. A regional analysis encompassing cultural, economic and physical features.

3743 (I,S) Geography of South America. Areal distribution and analysis of physical, cultural and economic features of South America.

3753 (I,S) Geography of Asia. Systematic interpretation of significant spatial patterns of man and natural environment. (Exclusive of the USSR.)

3763 (I,S) Geography of Africa. General patterns of population and cultural heritage in Africa; focus on elements and patterns that contrast with Western civilization.

3773 (I,S) Mexico, Central America and the Caribbean. A real distribution and analysis of physical, cultural, and economic features of Mexico, Central America and the Caribbean.
4003 Natural Hazards and Risk Assessment. 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.

4043 Applied Climatology. Prerequisite: 3023, 3033 or consent of instructor. Applications of atmospheric knowledge to human endeavors such as agriculture, water management, and architecture. Use of real-time atmospheric data to solve problems.

4053 Geography of Biotic Resources. Prerequisites: BISC 1403 or BISC 1603 or consent of instructor. Distribution of plants and animals and processes causing distribution. Human impact on biotic resources considered along with policy and management practices.

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.

4133 Land and Resource Regulation. Private and public land use controls, water law, mineral law, public land law and legal issues related to resource development.

4143 Geography of Travel and Tourism. A systematic and comprehensive analysis of the geographical dimensions of tourism, illustrating the relevance of a spatial perspective to tourism planning, development, and management. Economic, social, and environmental impact of both domestic and international tourism considered.

4153 Geography of Outdoor Recreation. Analysis of patterns of outdoor recreation with an emphasis on land-use planning in park and wildland areas. Demand forecasting methods, the analysis of the socioeconomic and spatial impacts of recreation facilities provision and visitor management practices.

4163 Geography of International Economic Systems. Prerequisite: 2253 or 3163. Emphasis on international flows of goods and services resulting from differences in comparative economic advantages. International trade and aid patterns from a geographic perspective. Resource use, transportation patterns, and levels of economic development.

4173 Geography of Retail Location. The critical role that geography plays in marketing decisions. Emerging socio-economic and life-style trends and the changing spatial pattern of American cities.

4183 Regional Analysis. An introduction to methods of examining and analyzing economic dimensions of regions.


4223 (H,SpD) 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.

4313 Field Techniques and Geodata Collection. Prerequisite: STAT 2013. Modern concepts and techniques for geographical research and analysis including data acquisition and manipulation from field and secondary sources. Field trips.

4323 Computer Cartography. Lab 2. Use of packaged computer programs to produce maps on both the printer and the plotter.

4333 Remote Sensing. Lab 2. Prerequisites: 3523 or FOR 3502 or GEOG 3502 or 5133. Use of several types of sensors and imagery in solving problems. LANDSAT imagery use. Uses and limitations of data extraction techniques, manual and computer-assisted. Applications to a variety of specific problems.

4343 Geographic Information Systems. Lab 1. Prerequisite: 4323 or 4333 or consent of instructor. Evaluation and application of various manual and computer-aided Geographic Information Systems (GIS); sources of data, conceptual approaches, equipment, and software. Discussion of various output products, specific applications, and GIS relationships to modeling.

4413 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 of geography.

4700 Geographic Regions. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Specialized study of specific local and foreign regions.

4910 Topics in Geography. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Specialized physical, social and methodological topics in geography.

4921 Applications of Geographic Analysis. Prerequisites: 3523, 3533. For geography majors or minors only. Applications of concepts and techniques relating to the students' Specialized studies. Designed to reinforce and synthesize knowledge gained from previous course work.

4930 Readings in Geography. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Directed readings on selected topics, regions or methods in geography.

4940 Undergraduate Cooperative Education Internship. 1-3 credits, maximum 3. Prerequisites: consent of departmental adviser and consent of instructor. Practical experience in applying geographical concepts to societal problems. Students work with both agency representatives and faculty members.

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.

5130 Resource Geography Seminar. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Spatial perspectives of selected topics in resource geography.

5140 Cultural and Historical Geography Seminar. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Development and critical analysis of research and theory in cultural and historical geography.

5150 Geography of Sport, Recreation and Leisure Seminar. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Spatial perspectives of topics selected in sport, recreation and leisure geography.


5313 Geographical Analysis. Lab 2. Prerequisite: one course in statistics. Application of models to geographic problem solving. Library, field techniques questionnaires and data processing in geographic research contexts.

5343 Advanced Geographic Information Systems. Lab 3. Prerequisite: 4343. Theory and methods of design, development, implementation, and applications of geographic information systems.

5403 Progress in Geography. Prerequisite: graduate standing in geography. Review of recent literature in light of current human and physical geography research themes.

5413 History and Philosophy of Geography. Prerequisite: graduate standing in geography. Identification and evaluation of major themes in geographical research and teaching.

5433 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.

5450 Seminar in Geography. 1-6 credits, maximum 6. Prerequisite: graduate standing in geography or consent of instructor. Specialized topics in geography.

5510 Research Problems in Geography. 1-3 credits, maximum 6. Prerequisite: consent of instructor.

5940 Graduate Cooperative Education Internship. 1-6 credits, maximum 6. Prerequisites: consent of departmental adviser and consent of instructor. Practical experience in applying geographical concepts to societal problems. Emphasis on programs in planning and geographic education.

6000 Doctoral Dissertation Research. 1-12 credits, maximum 30. Prerequisites: admission to candidacy and consent of major professor.

Geology (GEOL)

1014 (L,N)Geology and Human Affairs. Lab 2. The influence of geology and related earth sciences on the human environment. Energy and material resources, beneficial and hazardous natural processes, and the planetary and biological evolution of earth. Lab investigations environmentally oriented. No general education credit for students who are taking or have taken GEOG 1114.
1114 (L,N)Physical Geology. Lab 2. Composition and structure of the earth and the modification of its surface by internal and external processes. Mineral resources, sources of energy, and environmental aspects of geology. A background in precollege science and math is recommended. Field trip 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.

1224 (N)Prehistoric Life and Development of the Continents. Lab 3. Prerequisite: 1014 or 1114 or consent of instructor. Earth formation and the development of continents and oceans through time including the origin and evolution of life. Field trips required.

2031 Geologic Field Investigation. Prerequisite: introductory geology. One week of required field study at sites of geological interest and significance.

2253 Practical Mineralogy. Lab 3. Prerequisite: 1014 or 1114. Hand-specimen identification of minerals. Society's dependence on and utilization of mineral resources. 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, PHYS 1114 or consent of instructor. Behavior of earth materials during various deformational processes and analysis of the resulting structural features such as folds, faults and fractures. 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.

3033 Stratigraphy. Lab 3. Prerequisite: 1224. Principles of stratigraphy and their applications. Laboratory emphasizes realistic practical problems undertaken in the field and in the laboratory. Field trips required. Nonmajors may receive graduate credit.

3043 Ecologic Geologic Regions. Prerequisite: 1014 or equivalent recommended. The geologic characteristics of national parks and scenic regions in North America and throughout the world.

3073 Geomorphology. Lab 3. Prerequisites: 1224 or consent of instructor. Study of land forms and the processes that form them, using topographic maps, air photos, remotely-sensed images, soils maps and field techniques. Field trips required.

3103 (N)Paleontology. Lab 3. Prerequisite: 1224 or consent of instructor. Basic principles of paleontology involving invertebrates, vertebrates and plants. Lab focused on the morphology, identification, paleoecology and biostratigraphy of marine invertebrates. Field trips required.


3503 Environmental Geology. Prerequisite: 1114 or consent of instructor. Application of geologic principles to environmental issues, including human use of the surface and subsurface of the earth and human interaction with extreme natural events such as earthquakes, floods and landslides. Field trip is required.

3546 Field Geology. Lab 6. Prerequisites: 2364, 3014, 3033, 3073. Six weeks of field methods in geology. Required of all geology majors. Transportation and room and board fees required.

4010 Geology Colloquium. 1 credit, maximum 8. Prerequisite: junior standing. Lectures and demonstrations of timely interest in geology. Field trips may be required.

4023 Petroleum Geology. Prerequisites: 3014 and 3033. Origin, migration and accumulation of petroleum, requirements for source rock, reservoir rock and traps. Structure and stratigraphy of selected oil fields. Field trips required.

4213 Plate Tectonics and Mountain Building. Prerequisite: 3014. Principles and major concepts of plate tectonics, the unifying theory of earth sciences. Tectonic evolution of major chains of North America, Europe and Asia. Field trip required.

4403 Geochemistry. Prerequisite: general chemistry. Application of chemical principles to geological processes. Processes affecting the composition of surface and ground waters.

4453 Hydrogeology I. The water cycle and groundwater systems as well as general problems related to ground-water occurrence, quantity, quality and pollution. Field trip required.

4463 Hydrogeology II. Lab 3. Prerequisite: 4453 or consent of instructor. Physical groundwater systems. Realistic problems to acquaint students with groundwater occurrence and movement. Geologic, geophysical, hydraulic testing and modeling techniques used to define an actual ground-water system. Ground-water regulations. Field trips required.

4563 Sedimentology. Lab 3. Prerequisites: 3546, senior standing. Sediments, sedimentary processes and sedimentary environments, geometry and internal features of sediments. Field trips required.

4663 (N)Global Mineral Resources. Prerequisite: 1014 or 1114. Geology, origin, and economic utilization of metallic and nonmetallic minerals and rocks. The global distribution of minerals and rocks and their influence on international trade.

4990 Special Problems in Earth Science. 1-8 credits, maximum 8. Prerequisites: 25 hours of geology and permission of instructor. Individually designed study projects involving assigned reading, library work, field work, laboratory work or a combination of these. Field trips may be required.

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. Work toward master's thesis in geology.

5100 Problems in Hydrogeology. 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: consent of instructor. Advanced problems in engineering geophysics with emphasis on problem solving. Field trips may be required.

5183 Advanced Paleontology. Lab 3. Prerequisite: 3103 or equivalent. In depth study of selected fossil groups with emphasis on marine micropaleontology. 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. The theoretical, experimental and descriptive approach to structural geology, formation and analysis of rock fractures, and structural geometry. Field trips required.

5223 Advanced Methods in Structural Geology. Lab 3. Prerequisite: 3014. Advanced geometric techniques and analysis of complex structural terrains. Elucidation of geometry and history of geological structures by interpreting seismic reflection profiles and constructing balanced cross-sections. Field trips required.

5233 Trace Elements in Hydrogeology. Lab 2. Prerequisite: CHEM 1515. Examination of the behavior of various trace elements in the aqueous environment. Availability and mobility of selected trace elements, the characterization of geochemical environments, pe-pH stability fields, adsorption and other parameters that affect element mobility. Introduction to thermodynamic water-equilibrium computer programs.


5283 Subsurface Geologic Methods. Lab 3. Prerequisites: 3014, 3033. Use of subsurface geologic information from cores and well logs to prepare maps and identify oil and gas prospects. Field trips required.

533* Advanced Well Log Analysis. Lab 3. Prerequisite: 3033. The geologic interpretation of a variety of well logs, emphasized, as well as quantitative methods. Some exercises involve concurrent interpretation of well logs and core samples, or well logs and bit cuttings.


537 Practical Environmental Compliance. Environmental decision making, reading and understanding environmental statutes and regulations, and effectively dealing with the EPA. Environmental permitting and enforcement, policies and procedures. Review of hazardous waste regulations with emphasis on ground water problems.

5443 Engineering Geophysics. Lab 3. Prerequisites: 1144 or 3024, PHYS 1214 or equivalent. Geologic aspects of problems associated with 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, COMP 213 or equivalent, MATH 2145 and 2155 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 actual field problems and case studies. Field trips required.

5473 Regulatory Risk Analysis. Risk-based decision making, government’s risk analysis paradigm, risk analysis policy, and social aspects of risk assessment. Review of the RCRA corrective action. CERCLA (Superfund) remedial action, and NEPA environmental impact study programs.

5503 Advanced Environmental Geology. Prerequisite: 3503 or consent of instructor. Utilization of geologic principles to resolve environmental issues in land use, land management and development. Methods of acquiring, compiling, and applying geologic information for site assessment and environmental impact. Application of these methods to an interdisciplinary project. 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. Individual library, laboratory and/or field projects on facets of geology not covered by existing courses. Field trips may be required.

German (GRMN)

1115 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 Elementary German II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1115.

2112 Intermediate Conversation and Composition I. Lab 1. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Colloquial speech patterns and grammar. May be taken concurrently with other 2000-level German courses.

2113 (l) First Readings in German. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Selections from German newspapers and other contemporary material. May be taken concurrently with other 2000-level German courses.

2222 Intermediate Conversation and Composition II. Lab 1. Prerequisite: 2112 or equivalent competence. (May have been gained in high school.) Continuation of 2112, with further work in composition, conversation and grammar. May be taken concurrently with other 2000-level German courses.

2223 Introduction to German Literature. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Reading and analysis of prose, drama and poetry; literary appreciation. May be taken concurrently with other 2000-level German courses.

3013 German for Reading Requirements I. Reading in the humanities and sciences. Translation from German to English.

3023 German for Reading Requirements II. Prerequisite: 3013 or equivalent. Intermediate and advanced reading in the humanities and sciences. Translation from German to English.

3343 Business German. Lab 1. Prerequisite: 20 credit hours of German or equivalent. Introduction to business practices and economic environment in Germany. Study of specialized vocabulary.

3463 Advanced Diction and Phonetics. Lab 1. Prerequisite: 15 credit hours of German or equivalent. Required course for teacher certification. German speech sounds and intonation patterns. Practice to improve the student’s pronunciation.

3803 (l) 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.

3813 (H) 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.

3902 Orientation to Internship Abroad. Prerequisite: 20 hours of German or equivalent. Preparation for residential internship in a German-speaking country. Culture, civilization, and contemporary conditions, and communication for students accepted for international cooperative education program.

3903 (H) 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.

4153 (H) Survey of German Literature I. Prerequisite: 20 credit hours of German or equivalent. German literature from the beginning to 1785.

4164 (H) Survey of German Literature II. Prerequisite: 20 credit hours of German or equivalent. German literature from 1785 to the present.

4333 (H) Backgrounds of Modern German Civilizations. Prerequisite: 20 credit hours of German or equivalent. Historical, cultural, political and literary trends in the formation of German civilization. Capstone course.

4513 (H) The Age of Goethe. Prerequisite: 20 credit hours of German or equivalent. Principal figures of German Classicism and Romanticism.

4523 (H) 19th Century German Theater. Prerequisite: 20 credit hours of German or equivalent. Kleist, Buchner, Grillparzer, Hebbel, Hauptman and others.

4533 (H) 19th Century German Novelle and Lyric. Prerequisite: 20 credit hours of German or equivalent. Prose and lyric from Romanticism to Naturalism.

4543 (H) 20th Century German Literature. Prerequisite: 20 credit hours of German or equivalent. Main currents in German literature from Naturalism until present day.

4550 Studies in German. 1-3 credits, maximum 9. Prerequisite: 20 credit hours of German or equivalent competence. Reading and discussion of vital subjects in German.

Graduate (GRAD)

5800 Graduate Traveling Scholar. Credit will vary depending on the program of each traveling scholar. Maximum 12. Prerequisite: graduate degree candidacy. Enrollment of graduate traveling scholars in academic or research courses.

5883 Orientation to Gerontology. Prerequisite: graduate standing. Interdisciplinary introduction to the field of gerontology with particular focus on biological, psychological and sociological theories of aging.

5990 Graduate Research and Teaching Practicum. 1-6 credits, maximum 12. Prerequisite: graduate standing. Graduate-level instructional program in research and teaching techniques and procedures. Graded on pass-fail basis.

6010 Research or Intern Practicum. 1-9 credits, maximum 12. Prerequisite: graduate standing. Graduate-level internship program for public administration, service or research. Blends the theoretical and absolute phase of the academic with practical on-the-job experience.
Health (HLTH)

2213 Foundations in Health Education and Wellness. Analysis of major concepts, e.g., degenerative disease, human exercise capacity and health behavior.

2220 Laboratory and Clinical Experiences in Health. 1-3 credits, maximum 3. Prerequisite: health majors and minors. Directed observation and supervised laboratory and clinical experiences in appropriate teacher education and wellness program areas. Graded on a pass-fail basis.


2603 Total Wellness. Knowledge, attitudes and practices related to self-direction of health behavior for total well-being.

2653 Applied Anatomy. Action and location of individual muscles and muscle groups. Anatomy as applied to a living person. Common anatomical injuries and diseases will be presented with each joint structure.

2663 Care and Prevention of Athletic Injuries. Prerequisite: 2653. Symptoms of common athletic injuries, their immediate treatment and care.

3133 Community and Consumer Health. Structure and function of community agencies and programs related to health and parameters essential for being an informed consumer.

3623 School Health Programs. Prerequisite: 2603. The identity and relationships of school health instruction, services and environments.

3653 Advanced Care and Prevention of Athletic Injuries. Lab 2. Prerequisite: 2663. Advanced techniques applied to athletic injuries.

3901 Pre-internship Seminar. Prerequisite: junior standing. Core course for the community wellness program that prepares majors for the health internship experience.

3653 Activity Management. Lab 2. Prerequisite: 2653. Principles, practices, problems and improvements in HPEL; future needs and program innovations.

Field Problems in Health, Physical Education or Leisure Sciences. 1-6 credits, maximum 6. Individual investigations.

5043 Trends and Issues in Health, Physical Education and Leisure Sciences. Major trends and issues in higher education and professional preparation; principles, practices, problems and improvements in HPEL; future needs and program innovations.

5053 Research Design in Health, Physical Education and Leisure. Prerequisites: PSYCH 5303 or STAT 5013 or equivalent. Research design with applicability toward HPEL. Provides the student with a conceptual understanding of theory, tools and processes involved in designing research studies.

5073 Sport: Psychological Aspects. Psychological foundations of sport emphasizing performance enhancement by athletes through psychological training techniques.

5143 Health Promotion and Marketing. Prerequisite: HLTH 4433. Conceptual framework in dealing with health topics as they apply to targeted populations. Direction in developing needs assessment and measuring tools in behavioral modification with strong emphasis on health promotion proposal writing and marketing strategies.

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.

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 humans throughout history.

5453 Practicum for Human Service Professionals. A wilderness-based program for educators and human service professionals utilizing Colorado Outward Bound Schools experiential educational model for adapting traditional teaching methodologies.

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 2433 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 2483 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 health education.

5523 Current Readings in Health. Contemporary research, literature, projections and views as applied to total health and well-being.

5553 Psychomotor Development and Assessment. Analysis and assessment of typical and atypical psychomotor development. Theoretical knowledge and practical experience in understanding and assessing psychomotor development and function.

5563 Physical Education for the Learning Handicapped. Characteristics, psychomotor development and functioning of mentally retarded, learning disabled and emotionally disturbed individuals. Knowledge base and practical experience for providing assessment, prescription and programming services for individuals with learning handicaps.

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 HPEL.

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. Essential elements of administration and management including organizational structure and management styles, considerations and functions.

5773 Physical Education for the Physically Handicapped. Prevention, detection and correction of remediable physical defects.

5793 Mechanical Analysis of Physical Education Activities. Prerequisites: 5843 and PE 3663. Application of physical laws to physical education activities.

5823 Advanced Applied Anatomy. Prerequisite: HLTH 2653. Structure and movement of the human body with emphasis on the relationship of physical activity to musculoskeletal and neurological factors.

5833 Methods in Physical Education. Prerequisites: PE 3753 and 3773. Differentiation between teaching methods in physical education; advantages of the application of the individual methods to particular situations in teaching physical education.

5843 Quantitative Biomechanics and Kinesiology. Prerequisite: 5823. 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 1. Prerequisite: PE 3114 or equivalent. Theory and practice in resting and exercising EKG, stress test protocols and exercise prescription.

5858 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: PE 3114 or equivalent. Human energy production, utilization and storage in response to exercise.

5883 Program Development for Adapted Physical Education. Strategies for designing and implementing adapted physical education programs in public schools and higher education with emphasis on grant writing, public relations, interdisciplinary strategies, and advocacy.

6010 Independent Study in Health, Physical Education and Leisure Services. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Supervised reading, research or independent project study of trends and issues related to the areas of health, physical education and leisure studies.

6060 Statistical Computing and Proposal Writing. 1-3 credits, maximum 3. Prerequisite: 5053. Instruction in the use of SPSS and BMDP software using the University mainframe. Preparation of research proposals for studies in health, physical education and leisure.

History (HIST)

1010 Studies in American History. 1-2 credits, maximum 2. Special study in American history to allow transfer students to fulfill general education requirements as established by Regents' policy.

1103 Survey of American History. Meaning, vitality, and uniqueness of United States history since 1492 through a thematic examination of the nation's past. Satisfies, with POLSC 1113, the State Regents requirement of six credit hours of American history and American government before graduation. No credit for students with prior credit in HIST 1483 or 1493.

1483 American History to 1865. From European background through the Civil War. Satisfies, with POLSC 1113, State Regents requirement of six credit hours of American history and American government before graduation. No credit for students with credit in HIST 1103.

1493 American History Since 1865. May be taken independently of HIST 1483. Development of the United States including the growth of industry and its impact on society and foreign affairs. Satisfies, with POLSC 1113, State Regents requirement of six credit hours of American history and American government before graduation. No credit for students with credit in HIST 1103.

1613 (H)Western Civilization to 1500. Lab 1. History of western civilization from ancient world to Reforma. Laboratory discussion sessions on interpretation of primary sources in translation.

1623 (H)Western Civilization After 1500. Lab 1. History of western civilization from Reformaion to present. Laboratory discussion sessions on interpretation of primary sources in translation.

1713 Survey of Eastern Civilization. History of three eastern civilizations (East Asia, South Asia and West Asia) from pre-history to the 18th century. Special attention to their origins, development, and contributions to the evolution of world civilization.

2323 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)Russiato 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,SpD) Early Middle Ages, 325-1000. Economic, social, cultural and religious developments in Byzantium, Islam, and the Germanic West, which succeeded imperial Rome.

3233 (H,SpD) 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. Social, cultural, intellectual, political, economic and religious developments which led to the flowering of modern western civilization.

3253 (H) Early Modern Europe, 1618-1815. Economic, social, political, cultural and religious transformation of Europe from the opening of the Thirty Years War to the Congress of Vienna.

3263 (H) Modern Europe, 1815-1914. Impact of modernization on the character of European society. Factors that transformed the Continent into a battle ground in the 20th century.

3273 (H) Modern Europe Since 1914. Origins, character and impact of the first World War; emergence and consequences of the totalitarian state; nature of political and intellectual terrorism. Effects of worldwide economic depression; dilemmas of modern democracies; political collapse of Europe as a consequence of World War II.


3293 (H) Modern France, 1815-Present. French politics, economy, society, and culture from the defeat of Napoleon to France's post-World War II rebirth.

3303 (H) History of the Second World War. Problems leading to World War II with their international implications and consideration of the war years.

3353 (H) 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.

3373 (S) 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.


3393 (S) Modern England: 1714-Present. English history from the arrival of the house of Hanover through the decline of British influence following the Second World War. Political, social, and economic problems encountered as a result of the creation of the first modern industrialized state.

3403 (H) East Asia to 1800. Traditional Chinese civilization and its impact on Japan, Korea and Southeast Asia.

3413 (H) East Asia Since 1800. Impact of the Occident on China, Japan and Southeast Asia. Problems of trade and diplomacy; political and industrial transformation of Japan; revolutionary process in China; the rise of nationalism in Southeast Asia.

3423 (H,SpD) Modern Japan. Modernization process in Japan since 1868.

3433 (H,SpD) Modern China. Response of China to the West since 1840, with stress on economic, social and intellectual currents.


3613 (S) American Colonial Period to 1750. Colonialization of British and French North America; colonial political, social, cultural, intellectual and economic development; international rivalries; the imperial structure.

3623 (S) Era of the American Revolution. British imperial problems; the American Revolution; political, cultural, economic, social and religious changes; the War for Independence; the Articles of Confederation; the critical years.

3633 (S,SpD) 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.

3643 (S,SpD) The Jacksonian Era, 1828-1850. Development of a modern political system and an entrepreneurial economy; social reform; territorial expansion; and sectionalism.

3653 (S,SpD) Civil War and Reconstruction, 1860-1877. Causes, decisive events, personalities and consequences of the disruption and reunion of the United States.

3663 (S,SpD) 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.

3673 (S,SpD) America Since 1919. The United States since the 1920's with emphasis upon the 1920's, the depression, the New Deal, World War II and its aftermath; retreat from imperialism in the 1920's to world leadership in the 1950's.

3743 (S) 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.

3753 (S) Trans-Mississippi West. Emergence of the modern West from Spanish and French settlement and exploration, the Rocky Mountain fur trade, the settlement of Texas, Oregon, California, and Utah, the mining, ranching and farming frontiers, the Indian Wars and transportation.

3763 (S) American Southwest. Southwestern states of Texas, Arizona, New Mexico and California from the Spanish colonial period to the present. Mining, ranching, farming frontiers, Indian wars of the Apache, Comanche and other southwestern tribes, and the emergence of the modern Southwest.

3773 (S) Old South. Social, political and industrial conditions in the South before the Civil War.

3783 (S) New South. Recent history and major current social and economic problems of the southern regions of the United States.

3793 (S,SpD) Indians in America. American Indian from Columbus to the present, emphasizing tribal reaction to European and United States cultural contact and government policy.

3913 (S) History of Medicine. Historical growth of medicine and its relationship to the society in which it develops. Scientific problems, cultural, religious, and medicine.

3923 (S) Science in Society. Impact of science on society and of society on science during selected periods of history.


3953 (H) Religion in Modern Europe. Religious thought and experience as influences on the politics, economy, and general culture of European nations from the 17th century to the present.

3973 Historical Methods and Interpretations. Required of all history majors. Introduction to historical methods and interpretations.


3983 Historians and the Study of History, Prerequisite: 3973. An exploration of how the craft and theories of history has evolved over the centuries. Special emphasis on the controversies over purposes, methods, and meanings, especially in the 20th century.

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.
American Agricultural History. Growth and development of the agricultural foundation of the United States, including the social, technological and economic contributions made by agriculture.

American Foreign Relations to 1917. American experience in foreign relations from colonial times to World War I.

American Foreign Relations Since 1917. America’s emergence as the decisive factor in the world balance of power.

American Military History. Civil-military relations, the military implications of American foreign policy, and the impact of technological advances on warfare since colonial times.

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.

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.

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.

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.

Blacks in America. Achievements of blacks in America and their participation in the development of the United States.

Indians of Oklahoma. The Five Civilized Tribes and Plains Indians and their role in the history of Oklahoma to the present.

Women in America. Women in pioneer America, life, politics, family, work and modern society.

Women in Western Civilization. Focus on women in American and Plains Indians and their role in the history of America and their participation in the development and economic forces in American history.

Women in America and their participation in the development and economic forces in American history.

Blacks in America. Achievements of blacks in America and their participation in the development of the United States.

American Foreign Relations to 1917. American experience in foreign relations from colonial times to World War I.

American Foreign Relations Since 1917. America’s emergence as the decisive factor in the world balance of power.

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Indians of Oklahoma. The Five Civilized Tribes and Plains Indians and their role in the history of Oklahoma to the present.

Women in America. Women in pioneer America, life, politics, family, work and modern society.

Women in Western Civilization. Focus on women in American and Plains Indians and their role in the history of America and their participation in the development and economic forces in American history.

Honors (HONOR)

1000 Introductory Honors Topics. 1-3 credits, maximum 6. Prerequisite: Honors program participation. Introduction to topics in various disciplines by faculty from the undergraduate colleges for freshman and sophomore students in the University Honors Program.

1013 The Ancient World. Prerequisite: Honors program participation. Interdisciplinary study of art, history, philosophy and literature from ancient Greece and Rome as well as the religious ideas central to Judaism and Christianity. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student. No credit for students with prior credit in HONOR 2113.

1023 The Middle Ages and Renaissance. Prerequisite: Honors program participation. Interdisciplinary study of art, history, philosophy and literature from the Middle Ages to the early Renaissance. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student. No credit for students with prior credit in HONOR 2113.

1043 The Twentieth Century. Prerequisite: Honors program participation. Interdisciplinary study of art, history, philosophy and literature from the late 19th century to the present. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student. No credit for students with prior credit in HONOR 2223.

2013 Honors Law and Legal Institutions. Prerequisite: Honors program participation. An introduction to law in American society with reference 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.

2063 Ethical Issues Across Cultural Perspectives. Prerequisite: Honors program participation. An introduction to reasoned methods of evaluating ideas and arguments as they pertain to ethical issues from a global perspective. Concepts including obligation, justice, and ethics from Lao Tzu, Maimonides, Kant, and Indian wisdom stories. Environmentalism, technology, and cultural knowledge. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student.

2514 Honors Scientific Inquiry. Lab 2. Prerequisite: Honors program participation. An interdisciplinary course dealing with philosophical science and the application of the scientific method in the natural and social sciences. Selected topics that involve interdisciplin ary scientific inquiry. For the Honors student.

3000 Advanced Honors Topics. 1-3 credits. Prerequisite: Honors program participation, junior standing. Topical study in various disciplines taught by faculty from the undergraduate colleges for junior and senior students in the University Honors Program.

3013 Holocaust Studies Seminar. Prerequisite: junior standing. Honors program participation. An interdisciplinary study of one of the problematic events of human history—the Holocaust. Addresses questions of good and evil, divinity and humanity, and truth and responsibility that arise from this event. For the Honors student.

4993 Honors Creative Component. Prerequisites: Honors program participation, senior standing. A guided creative component for students completing the requirements for college or departmental honors awards leading to an honors thesis, project or report under the direction of a faculty member from one of the undergraduate colleges, with a second faculty reader and oral examination.

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 indoor plants. Intended for non-majors only.

1013 Principles of Horticultural Science. Lab 2. Basic physical and physiological processes responsible for plant dormancy, growth, flowering, fruiting, and senescence with respect to the science and art of production, cultivation, utilization, and/or storage of horticultural plants. Current research associated with various horticultural commodity groups.
Internship in Horticulture. 1-6 credits. Maximum 6. Prerequisites: 24 credit hours and consent 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.

2112 Indoor Plants and Interior Plantscaping. Lab 2. Identification, cultural requirements and use of ornamental foliage and flowering plants for indoor gardens.

2212 Herbaceous Ornamental Plants. Lab 2. Identification, cultural requirements and landscape value of ornamental flowering herbaceous plants. Discussions of design and installation of herbaceous beds and borders.

2652 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.

3014 Business and Practice of Arboriculture. Lab 2. Prerequisites: 3312 and 3322 or FOR 2134, and AGRON 2124. Theory and practice of selecting, planting and maintaining trees, shrubs and vines. Basics of the landscape management business, including estimates for labor, equipment and plant materials; bidding; costs and record keeping; and employee safety.


3113 Greenhouse Management. Lab 3. Prerequisites: 1013, 2112, BIOL 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. Prerequisites: 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: BIOL 1403. Commercial production of fruits and nuts, with emphasis on pecan, apple, peach, strawberry, blackberry and blueberry. A two-day field trip is required.

3312 Landscape Plant Materials I. Lab 2. Prerequisite: BIOL 1114 or 1403. Identification, adaptation, tolerance and use of deciduous trees, shrubs, vines and ground covers in the landscape.

3322 Landscape Plant Materials II. Lab 2. Prerequisites: 3312 and BIOL 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 BIOL 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 turfgrasses and the interrelationship between stress and the cultural practices of turfgrasses.

4671 Horticultural Seminar. Prerequisite: junior standing or above. Contemporary problems and topics in horticulture, individual seminar reports, group discussion, career exploration, state, national and global horticultural issues and job placement.

4774 Landscape Contracting and Planning. Lab 6. Prerequisite: 3123 or 3322 or consent of instructor. Concepts of landscape contracting and planning. Preparation of specifications, estimates and bids. Emphasis on residential landscapes and use of plant materials. No credit for students in the landscape architecture (BLA) program.

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.

5122 Temperature Stress Physiology. Prerequisite: BIOCH 3653, BOT 3463 or consent of instructor. Effects of heat, chilling and freezing stress on plants. Responses to temperature extremes at the molecular to whole plant levels, with emphasis on mechanisms of injury and resistance.

5123 Horticulture Science. Prerequisites: BOT 3463, BOT 3460 or equivalent or senior standing. The basics of applied physiological responses of plant growth as related to horticulture plants. Includes hormonal, genetic and environmental influences on horticultural plant growth and production.

5233 Experimental Horticulture. Methods of conducting research with horticultural crops including organization and plans, field plot techniques and analysis of data.
Prerequisites: 3133 or concurrent enrollment. Procurement of food and nonfood materials in hospitality and related industries. Same as NSCI 3553.

4103 Legal Aspects of Hotel and Restaurant Management. Prerequisites: 3213, completion of 60 credit hours. Examination of the laws regulating the lodging and food service industry. Development of an appreciation of the interrelationships between law and industry. Exploration of how legal principles apply in a global environment.

4213 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.

4223 Concepts and Practices in the Tourism Industry. Prerequisite: GEOG 2253 or consent of instructor. Handling and managing group tours involving airline, ocean-going, and ground transportation. Economic impact of tourism on related hospitality industry operations. Travel industry financial management, technology, economic planning, and policy formulation. The creation of the corporate travel department.

4333 Food, Beverage and Labor Cost Controls. Prerequisites: ACCTG 2203, junior standing. Menu analysis and food/beverage/labor cost controls associated with hospitality industry operations. Same course as NSCI 4333.

4356* Quantity Food Production Management. Lab 3. Prerequisites: 2125, HRAD of NSCI 3313, 3553, and a course in accounting or mathematics or consent of instructor. Organizing, purchasing, costing, preparation and service of food in a quantity food production setting. Same course as NSCI 4365.

4413* Lodging Operation Systems Analysis. Prerequisite: 3363 or consent of instructor. Conceptual analysis of hospitality operation systems such as reservation, front desk, housekeeping, sales, properties management, properties feasibility, personnel, accounting and front office. Investigation of inter- and intra-departmental functions.

4475 Hospitality Layout, Equipment and Furnishings. Prerequisites: 3473, 4365. The use of the AutoCad system in the planning process, space allocation and arrangement of furnishings, equipment and utilities in a hospitality facility. Time and motion efficiency and equipment specifications.

4523 Critical Issues in Hospitality Industry Administration. Prerequisites: completion of all required HRAD course work, including concurrent courses. Breadth of vision and broad perspective of contemporary issues in the management of hospitality industry organizations. Awareness of societal issues and their application to the industry.

4573 Institution Organization and Management. Lab 3. Prerequisites: 3553, 4365 or NSCI 3553, 4365. 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 NSCI 4573.

4723 Survey of Beverages in the Hospitality Industry. Lab 2. Prerequisite: senior standing. History, classifications, production techniques and quality factors of beverages such as wines, distilled spirits, beers, and non-alcoholic beverages. Emphasis on responsible alcohol beverage service and management techniques.

4850 Special Unit Course in Hotel and Restaurant Administration. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special unit of study related to specific problems in the hospitality industry.

4883* Multi-unit Food Service Management. Lab 4. Prerequisites: 4365, 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.

4983 Conference and Meeting Planning. Prerequisite: junior, senior or graduate standing; an upper-level management and promotion or sales course. Planning and implementing conferences, teleconferences, conventions, special events, seminars and symposia. Designing, promoting, managing and evaluating educational events, contract management.

Human Environmental Sciences (HES)

1001 Seminar in Human Environmental Sciences. Mission of the College as a basis for value exploration and problem solving. Investigation of the integrative nature of the profession and general education. Required of all students in the College of Human Environmental Sciences.

1111 Exploration in Human Environmental Sciences. Exploration of majors and careers in the field of human environmental sciences. Designed to introduce students to campus resources and enhance students' study skills. Graded on a pass-fail basis.

2001 Professionalism and Ethics. Ethical issues and strategies for developing professionalism in content areas of the profession. Required of all students in the College of Human Environmental Sciences.

3001 Contemporary Issues Within the Global Community. Awareness of global interdependence as it affects individuals and families. Exploration of the impact of public policy on these issues. Required of all students in the College of Human Environmental Sciences.

5102 Research Methodology. Methods of research in various areas of human environmental sciences including types of research and such aspects as problem definition, design, sampling, data collection, data analysis, reporting and reviewing.

5151 Interdepartmental Seminar. Analysis of current issues from the perspective of human environmental sciences. Application of research findings related to issues.

6180 Research Seminar. 1-3 credits, maximum 3. Prerequisite: graduate course in research methods or consent of instructor. Research in human environmental sciences with emphasis on problems involving a multidisciplinary approach. Methodological analysis of research. Development and evaluation of research focused on current problems.

6990 Graduate Seminar in Human Environmental Sciences. 1-3 credits, maximum 3. Prerequisite: consent of instructor. Analysis of philosophy, critical issues, current developments and interrelationships among elements in human environmental sciences.

Industrial Engineering and Management (INDEN)

2903 Introduction to Industrial and Systems Engineering. Lab 2. Prerequisites: ENGR 1412; MATH 2145. Industrial engineering concepts and techniques in production control, quality control, layout, methods engineering, material handling, mathematical programming, and engineering economics. Laboratory sessions provide additional learning experiences with these topics and with computer software used in industrial engineering analyses.

3303 Industrial Processes I. Lab 3. Corequisite: ENSC 3313. Manufacturing processes used to transform raw materials including metals and non-metals into finished goods. Near-shape processing and basic metal cutting theory, process selection, and planning. Field trips to manufacturing plants.

3313 Industrial Processes II. Lab 3. Prerequisite: 3303. Manufacturing processes in joining, finishing, metrology, nontraditional machining, tool design, electronics manufacturing assembly and numerical control. Field trips to manufacturing plants.

3503 Engineering Economic Analysis. Prerequisite: MATH 2155. Development and use of time value of money interest formulas. Bases for comparing alternatives, including present worth, annual worth, rate of return and payout period methods. 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 analysis.


3523 Engineering Cost Information and Control Systems. Prerequisite: MATH 2145. Basic cost measurement and control concepts. How to measure and interpret cost data and define its use in planning, control and estimating. Role of accounting in cost control.
3603 Industrial Operations Analysis. Prerequisite: sophomore standing. Production management, covering the main aspects of organization, 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 2145. 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 emphasis upon fundamental concepts in the industrial environment.


4010 Industrial Engineering Projects. 1-3 credits, maximum 6. Prerequisite: consent of school 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.

4025 Operations Research II. Prerequisites: MATH 2233, STAT 4033 and FORTRAN. Continued study of the fundamental methods of operations research; computational techniques on nonlinear programming, dynamic programming, inventory theory and analysis, queuing theory and analysis and simulation.

4103 Industrial Quality Control. Prerequisite: STAT 4033. Principles and practice of industrial control. Modern quality philosophy, including a process improvement strategy incorporating charting, documentation of knowledge and improvement cycle. Theory and use of statistical process control (SPC) tools for problem solving and continuous improvement. Variables and attributes control charts for both discrete and continuous flow/batch processes. Process capability and performance analysis including strengths and weaknesses of Cpk and Ppk indices. Introduction to acceptance sampling, including ANSI/ASQC Z.1.4 standards.

4113* Industrial Experimentation. Prerequisite: 4103. Analytical methods for the purpose of continuous process improvement using the Deming approach. Experimentation driven by the Taguchi loss function, Taguchi arrays, linear graphs, triangular tables, and Taguchi's concepts of parameter and tolerance design. Extensive use of factorial and fractional factorial designs for measurement and attributes data. Analysis of variance and graphical interpretation of significant factors and interactions. Wide variety of industrial applications.

4203* Facility 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-quantity analysis and material flow, and information routing warehouse design, various layout methodologies, and their measures of merit. Introduction to material handling methods and technologies including automated systems. Case studies and field trips are required.

4232 Manufacturing Systems Design. Prerequisites: 3312, 3503. Principles and procedures related to the design, implementation, documentation, and control of manufacturing systems. Consideration of transfer lines, numerical control, flexible automation, robotics, and manufacturing support 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. Application of management, 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 progress control. A production simulator is used to provide a realistic application experience.


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. Data base management systems. Distributed and centralized systems. Different phases of system design and implementation.

4823 Industrial Ergonomics. Lab 3. Prerequisite: 3813. Characteristics of humans, equipment, and work environment examined using a systems approach. Job designs that concurrently emphasize multiple goals of productivity, safety and employee satisfaction, investigation of psychological, social, safety, reward, training and ergonomic parameters that affect work life of both employee and supervisor.

4913 Senior Design Projects. Lab 6. Prerequisite: admitted 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, ENGS 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. Analysis of facilities and equipment, both new and existing. Lab work required on audit equipment.

4931 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 and money, and job-related expectations. 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 2233 or 3623. Fundamental quantitative methods necessary for advanced study in various areas of industrial engineering. Includes matrix algebra, 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 MATH 3013; FORTRAN. Simplex algorithm to solve deterministic linear optimization models considering maximization and minimization on objectives. Degeneracy, alternative optimal and no feasible solutions. Revised simplex procedures. Duality theory, economic interpretations, dual simplexing and complementary pivoting. Sensitivity analysis and parametric programming. Special cases of linear optimization 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 experience in a real-life 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. May consist of full or 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. Prerequisites: 4014, 5003. 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 underlying assumptions such as normality and error-free inspection. Oriented toward economically-based statistical monitoring of processes, including optimization of decision variables such as sample size, frequency, and control limit spread.

5113 Total Quality Management. Prerequisite: graduate standing. Major categories of criteria for the Malcolm Baldridge National Quality Award, including leadership, information and analysis, strategic quality planning, human resource utilization, quality assurance, results, and customer satisfaction. Key concepts and tools; customer requirements determination, customer satisfaction measurement, cost of quality, quality planning, supplier relations, process improvement strategy, causes of variation, process stability and control, process capability, the use of SPC tools, and measures of performance. Emphasis on those activities that outstanding companies do well.

5133 Stochastic Processes. Prerequisites: MATH 2233, MATH 3013, STAT 4113. Definition of stochastic processes, probability structure, mean and covariance function, the set of sample functions. Renewal processes, counting processes, Markov chains, birth and death processes, stationary processes and their spectral analyses. Same course as STAT 5133 and MATH 5133.

5203 Advanced Facility Location and Layout and Material Handling Systems. Prerequisite: 3503, 4014, 4203. A continuation and expansion of topics covered in 4203 with an emphasis upon model development for predicting and evaluating the effectiveness of production and/or service systems. Advanced analytical and computer techniques.

5303 Computer Integrated Manufacturing. Prerequisite: 4323. 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 instructor. Role of robotics in modern manufacturing systems. 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.

5350 Industrial Engineering Problems. 1-6 credits, maximum 6. Prerequisite: approval of major adviser and a member of the Graduate Faculty. A detailed study of industrial engineering with a required written report.


5603 Project Management. Prerequisite: 4413 or equivalent. A systems approach to planning, organizing, scheduling and controlling projects. The behavioral and quantitative aspects of project management. Importance of working with personnel as well as technology. Project management software utilized.

5613 Integrated Manufacturing Control Systems. Prerequisite: 4613. Manufacturing planning and control philosophies and methods for production systems. Requirements planning, including information integration, capacity planning, shop floor control, purchasing, master scheduling, production planning, and demand management. Also just-in-time as used in both Japan and the U.S., including total quality control, total cost reduction, and total productive maintenance.

5633 Advanced Production Control. Prerequisites: 4014, 4613, corequisite: 5003. Advanced concepts and quantitative techniques used in production planning and control, including demand forecasting using regression, time series analysis, and Box-Jenkins models, mathematical programming approaches, to aggregate planning and to detailed scheduling. Static and dynamic scheduling of machines and cells, and independent demand inventory management. Deterministic and stochastic models and their relationship to Just-In-Time and Zero Inventory practices.

5643 Network Modeling and Analysis. Prerequisites: 4014, 5003. Network approach to the modeling and analysis of complex systems. Deterministic and stochastic topics include PERT, CPM, decision trees, network flows, flowgraphs, and GERT (Graphical Evaluation and Review Technique). Modeling of practical problems. Systems analysis using network techniques and available computer programs.

5703 Discrete Systems Simulation. Prerequisites: STAT 4033 and FORTRAN. Discrete-event systems via computer simulation models. Model building and the design and analysis of simulation experiments for complex systems. Application to a variety of problem areas. Use of SLAM simulation language.


5803 Human Factors Engineering. Prerequisites: 3813, STAT 4013 or STAT 4033. Basic considerations of the human factors in engineering systems with emphasis on the interface of man-machine systems. Development of human abilities and limitations in relation to equipment designs and work environments.

5813 Productivity Measurement and Improvement. Prerequisites: 3813 and 4413 concurrently. Productivity issues, concepts, theories and insights focusing on job and organizational design are explained, illustrated and discussed. Understanding the productivity improvement process. Development of productivity measurement systems. Designing organizational processes which improve productivity.

5913 Decision-Making Models for Multi-objective Analysis. Prerequisite: 4014. Quantitative and qualitative aspects of multi-criteria decision making. Dynamics of the decision process are examined and the multi-objective nature of most managerial decision problems is illustrated. General concepts and solution methodologies of the multi-objective problem. Multi-objective linear programming, goal programming, and compromise programming. Attribute importance, risk measurement, and utility measurement.

5923 Advanced Energy and Water Management. Prerequisite: 4923. Continuation of material covered in 4923 with an emphasis on modern management techniques. Cogeneration, energy management control systems, private purchases of gas, energy accounting. Significant case study or term paper required.

5933 Artificial Intelligence and Expert Systems. Lab 2. Prerequisite: graduate standing in industrial engineering and management. Fundamental concepts: search-oriented problem solving, knowledge representation, logical inference, building an expert system, artificial intelligence languages, specialized machine architectures. Application to planning, natural language processing and robotics. Development of an expert system or research report required. Common lectures with COMSC 5793, ECEN 5293 and MAGE 5793.

5943 Hazardous Material and Waste. Prerequisites: 3503 or equivalent, CHEM 1515. Management of hazardous materials and waste by the generator to reduce operating costs and protect employees. Emphasis on hazard communication program, reducing volume and toxicity, and management activities. 6 credits.

6000 Research and Thesis. 1-15 credits, maximum 30. Prerequisites: approval of major adviser and advisory committee. Independent research for Ph.D. dissertation requirement under direction of a member of the Graduate Faculty.

6023 Nonlinear and Integer Optimization. Prerequisites: 4014 or 5013; FORTRAN or PASCAL. Theoretical and practical aspects of nonlinear and integer optimization. Development and application of nonlinear optimization techniques for unconstrained and constrained problems; sequential search, gradient, penalty and barrier, and projection methods. Development and application of integer and mixed integer techniques for unconstrained and constrained problems; implicit enumeration, branch and bound, and cutting methods. Same course as COMSC 6023.

6110 Special Problems in Industrial Engineering. 1-6 credits, maximum 12. Prerequisites: consent of school Head and approval of major adviser. Special problems in industrial engineering and management under supervision of a member of the Graduate Faculty.
Reliability and Maintainability. Prerequisites: 5003, STAT 4033, FORTRAN. Probabilistic failure models of components and systems. Detailed study of reliability measures, and static and dynamic reliability models. Classical and Bayesian reliability testing for point and interval estimation of exponential and Weibull failures. Reliability optimization through allocation and redundancy. Fundamentals of maintainability.


Theory of Systems Organization II. Prerequisites: 5413 or consent of instructor. Theory and practice of internal and external engineering consulting. Investigation of the engineering-client interface, effective engineering consultations in relationship to existing organizational cultures and policies, and the engineering practitioner’s impact on organizational improvement.

Analysis of Decision Processes. Prerequisites: 5003, STAT 4113 or 4203, FORTRAN. Bayesian analysis of decision processes. Applications using Bernoulli, Poisson, and normal processes.

Advanced Systems Modeling. Prerequisites: 4014, 5003, 4713 or 5703; FORTRAN 77, Pascal or C. Methodologies for the modeling, analysis, and optimization of large, complex systems. Modeling and performance analysis using Petri nets, object-oriented modeling, optimization using simulation, and continuous systems simulation.

Japanese (JAPAN)


Intermediate Japanese I. Prerequisite: 1115 or equivalent. Reading, the writing system, culture, grammar, conversation.


Intermediate Japanese III. Prerequisite: 2123 or equivalent proficiency. A continuation of 2123.

Advanced Japanese Conversation I. Designed to increase facility and naturalness of delivery in dialogue. Development of general oral and aural proficiency.

Advanced Japanese Conversation II. Designed to increase facility and naturalness of delivery in dialogue. Development of general oral and aural proficiency.

Readings in Japanese I. Development of the student’s competence in reading a wide variety of materials by contemporary Japanese writers. Designed to be taken concurrently with 3233.

Introduction to Business Japanese. Prerequisites: 2223 or equivalent; concurrent enrollment in 3133. Introduction to business vocabulary and writing of correspondence. Japanese business customs and practices.

Introduction to Technical Japanese. Prerequisites: 3133 or equivalent; concurrent enrollment in 3333. Introduction of the student to scientific and technical Japanese.

Readings in Japanese II. Prerequisite: 3133. Designed to be taken concurrently with 3233.

Journalism and Broadcasting (JB)

Mass Media Style and Structure. Elementary writing and editing techniques in print, broadcasting and other media.

Principles of Advertising. Prerequisite: sophomore standing. Elements and purposes of advertising: media functions, economic aspects, budgeting, appropriations, rate structures and terminology.

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 publics.

Introduction to Broadcasting. History, growth and development of radio and television; FCC and other federal regulatory agencies; station management and operations; and the language of pictures; photojournalism; design practice, ethics and legal considerations from an editor’s viewpoint; design techniques for newspapers and magazines including picture editing, introduction to type, makeup and design practices, and special pages.

Public Relations Media. Lab 6. Prerequisites: 2393. A fundamental skills course in planning, researching, writing and editing materials used in public relations communications.

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.

Advertising Copy and Layout. Lab 3. Prerequisites: 2413, Journalism and Broadcasting 259. Modern merchandising methods; application emphasizing local and regional problems.

Graphical Communication. Lab 3. Creative and graphic aspects of typical typography, layout and design; and production of printed communication.

Photography 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.

Radio-Television Laboratory. 1-2 credits, maximum 5. Prerequisites: junior standing and completion of 1393, 2393, or 2413 or consent of instructor. Laboratory and/or internship practice for qualified students who wish creative communications experience beyond that available in the classroom.

Journalism and Broadcasting 259
4653 Television and Radio Advertising. Lab 3. Prerequisite: 3603. Functions and characteristics of broadcast advertising; copywriting, scriptwriting, story boards, marketing plan; film and videotape commercial production.

4842 Public Relations Programs. Prerequisite: 4183. Research, preparation and presentation of public relations campaigns. Integration of public relations principles and methods; work in teams in organizational and agency situations. Lab 3. Prerequisite: 3913. Techniques and aesthetics of television directing in various standard directing formats.

Advanced Television Practices. Lab 3. Prerequisite: 3913. Advanced professional television production. Student-produced and directed television programs, including "specials," for distribution on cable or other professional media.

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 journalism and broadcasting.

Landscape Architecture (LA)

1013 Introduction to Landscape Architecture and Landscape Contracting. An overview of the field of landscape architecture and landscape contracting with emphasis on the role of the landscape architect/landscape contractor and the need for design and management of outdoor space and structures and the environment.


2213 Landscape Architectural Graphics I. Lab 6. Prerequisite: 3 hours credit in freehand drawing or drafting. Drafting and illustration techniques for developing and presenting landscape concepts and designs in black and white media. Computer graphics applications including illustration, typesetting, scanning and visualization techniques.

2223 Landscape Architectural Graphics II. Lab 6. Prerequisite: 2213. The application of multimedia color presentation and delineation techniques to master complex plans, drawings and programs.

3010 Internship in Landscape Architecture and Landscape Contracting. 1-6 credits, maximum 6. Prerequisites: 45 credit hours, consent of instructor. Supervised work experience in approved public and private employers in landscape architecture, landscape contracting or related fields. May not be substituted for other required courses.

Landscape Architecture Seminar I. Prerequisites: 3324. Professional analysis of various aspects of the landscape architecture profession and designed works with guest speakers and in-state or regional field trips to completed works. Required of fourth year students.

Landscape Architecture Design I Lab. 8. Prerequisite: 1013, 1122 and 2223. Introduction to the principles of design, problem solving, site analysis, and the correlation of aesthetics and economics with functional solutions in small-scale landscape architecture design problems and computer-aided design applications.

Landscape Architecture II Lab. 8. Prerequisite: 3314. The design of small to medium scale landscapes with the emphasis on design process, site analysis and computer-aided design applications.

(H) History and Theory of Landscape Architecture. Prerequisites: (H)History and historic styles and approaches to landscape architectural design. Past and present landscape design theory.

Landscape Architecture Design III Lab. 6. Prerequisite: 3884. Advanced grading, horizontal and vertical roadway alignment, site layout and staking plans, construction documents, cost estimating, overview of soils construction materials and specifications, site utilities, computer applications and calculations.


Landscape Architecture Design Seminar II. Prerequisite: 4414. Topics in landscape architecture and related fields, career exploration and job placement. Out-of-state field trips to completed landscape architecture projects. Required of fifth year students.

Landscape Architecture Design IV. Lab 6. Prerequisite: 4414. Medium-scale complex landscape architecture projects and the correlation of aesthetics and economics with the principles of design, problem solving, site analysis, and design process. Integration of landscape design elements as they relate to functional and aesthetic qualities. Integration of landscape architecture design projects as their part of design presentation, and computer-aided design applications.

Landscape Architecture Analysis and Use. Lab 3. Prerequisite: 3313. The inventory and analysis of natural and man-made landscape resources and their application to land use.

Landscape Architecture Design V. Lab 8. Prerequisites: 4424, 4894. The design of large-scale sites with an emphasis on mixed use developments and computer-aided design applications.

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.

Broadcast Management. Prerequisite: senior standing or consent of instructor. Functions, structure and organization of the broadcasting industry; special problems in broadcast station management, including personnel, sales, programming and government regulations.

Special Problems in Journalism and Broadcasting. 1-3 credits, maximum 6. Prerequisites: junior standing, a minimum of 3.00 GPA, and consent of instructor. Independent study and project development to fit the student's major or minor specialization.

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.

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.

Communications in Agriculture. Fundamentals of newswriting and other communication methods; the role of the news media in agriculture and related fields. Same course as AGCOM 4453.

Advanced Radio-Television News Reporting. Lab 3. Prerequisites: 3553 and 3913. Advanced broadcast news writing with emphasis on techniques of feature and in-depth reporting for radio, television and cable television.

Broadcast Documentary. Lab 3. Prerequisites: 3553, 3913. Student-written and -produced broadcast and cablecast mini-documentaries; analysis of selected programs.

Advertising Campaigns. Lab 3. Prerequisite: 4653. Preparation and presentation of advertising-promotion merchandising campaigns for national and local firms; work in teams with agencies and clients.
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; scoring and etiquette.

1232 Beginning Golf. Lab 2. Theory and practice of basic skills, rules, terminology and etiquette.

1242 Beginning Tennis and Racketball. Lab 2. Theory and practice of 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 Riffley. Lab 2. Theory and practice of archery and riflery; basic skills of target shooting, scoring, care and selection of equipment, and safety rules.

1322 Bowling. Lab 2. Theory and practice of approaches, deliveries and mechanical principles involved in aiming and follow through.

1342 Physical Fitness. Lab 2. Theory and practice of aerobic and weight training activities with learning experiences designed to promote physical fitness.

1352 Weight Training. Lab 2. Improvement of muscular strength and endurance in the major muscle groups of the body through progressive resistive exercise. Fundamental anatomy, physiology, exercise physiology, mechanical principles, methods and techniques as applied to weight training programs.

1362 Self Defense. Lab 2. Theory and practice of self-defense; scientific principles of gravity and body control over opposing forces, and principles of contest judo.

2112 Rock Climbing. Lab 2. Theory and practice in the basics of technical rock climbing, bouldering and spelunking.

2122 Backpacking and Hiking. Lab 2. Theory and practice of outdoor skills and leadership techniques for executing and evaluating a wilderness activity.

2132 Bicycling. Lab 2. Theory and practice in the basics of bicycling, bike touring and bike mechanics.

2142 Canoeing and Kayaking. Lab 2. Prerequisite: 2372 or equivalent. Theory and practice of basic skills and techniques of canoeing and kayaking in open water and whitewater.
2433 Introduction to Therapeutic Recreation. Theory and application of therapeutic recreation with emphasis on types of illnesses and disabilities, delivery systems, programming and services.

3212 Lifeguard Training. Lab 2. Prerequisites: 2372 or equivalent and ability to swim 500 yards. Theory and practice of water safety and rescue skills essential for lifeguards. May obtain American Red Cross Lifeguard Training Certification.

3430 Practicum. 1-3 credits, maximum 3. Prerequisites: 2413, 2422. Supervised practical experience with leadership responsibilities for planning, conducting and evaluating activities and programs. Graded on a pass-fail basis.

3443 Camp Leadership. Lab 2. Philosophy of camping with 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.

3473 Evaluation of Leisure Services. Prerequisite: 3463. Methods, techniques and application of the evaluation process related to a wide variety of leisure service functions: clientele, 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.

3491 Pre-Internship 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. Learning in, about, and for, the outdoors as a process for acquiring skills with which to enjoy outdoor pursuits.

4463 Areas and Facilities in Recreation. Prerequisites: 3463, PE 3773. 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.

4480 Internship in Leisure. 6-12 credits, maximum 12. Prerequisite: last semester-senior year with cumulative GPA of 2.50. Supervised field work experience in leisure services management or therapeutic recreation. Graded on a pass-fail basis.

4483 Interpretive Services in Recreation. Prerequisite: 4473 or FOR 4553 or concurrent enrollment. Organization and administration of visitor centers and interpretive naturalist programs, philosophic approaches, and methods for interpreting the natural and cultural history of public parks and recreation areas.

4493 Administration of Leisure Services. Decision making, problem solving, personnel policies, legal issues, fiscal policies and budget procedures related to the delivery of leisure services.

4513 Facilitation Techniques in Leisure Counseling. Prerequisite: 3483. Philosophy, history, trends, models, legal aspects and basic methods of leisure counseling and leisure education.

4523 Program Design in Therapeutic Recreation. Prerequisite: 3483. Systematic approach to the development, design and evaluation of therapeutic recreation programs.

4563 Industrial and Commercial Recreation Management. Prerequisite: 3463. Industrial and commercial recreation management: budgeting, facilities, programming and operational procedures.

4573 Leadership in Experiential Education. An investigation of leadership styles and management models with an application to adventure based education.

4580 Technical Management in the Wilderness. 1-6 credits, maximum 6. Developing technical competencies 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 management of library learning resources centers; state, regional and national standards; understanding of the routines, methods and records necessary for the daily operation and supervision of the elementary or secondary school center; direction and training of student assistants; consideration of established library policy in school and community relationships.

3050 The School Library and Learning Resources Center in the Curriculum. 2-5 credits, maximum 5. Lab 1, 1-2 hours, designed for teachers. Importance and effective utilization of the centralized school library media center in the teaching-learn- ing process, evaluative selection tools of print and nonprint media, and reading guidance tools. Initial course is 2 credit hours. In addition, storytelling and field experience credits are available for 1-3 credit hours.

4113 Reference Materials. Selection, evaluation and use of basic reference materials most commonly used in all types of libraries; the organization of reference service; interpretation of reference questions.

4213 Selection of Book and Nonbook Materials. Selection principles, practices and problems in terms of library and learning resources centers objectives; examination of basic bibliographic aids and reviewing media involved in book and nonbook selection; analysis and practice of annotations; oral and written reviews of books, films, instructional materials and other media.

4313 Young Adult Literature. Survey of print and non-print materials, including multicultural and multi-ethnic materials, for young adults from middle school through high school. History, criticism, selection and evaluation of young adult literature and exploration of its relation to the needs and interests of young people. Same course as CIED 4313.

4414 Introduction to Cataloging and Classification. Basic principles of cataloging, with practice based on functional application of current codes and manuals recognized by the profession.

4550 Special Studies in Libraries and Learning Resources Centers. 1-6 credits, maximum 6. Designed to meet individual and group needs of librarians and educational media specialists, teachers and others; includes enrichment tours and work- shop 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 modern library; implications of new media and techniques on library service; survey of professional library literature; professional philosophy and ethics.

5013 Bibliography of Special Fields. Prerequisite: consent of instructor. Bibliographical literature and data banks in the humanities, sciences, 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 useful governmental publications and indexes; selection, acquisition and care of pamphlet materials.

Management (MGMT)

3013 Management. Prerequisites: completion of 50 credits and ACCTG 2203, ECON 2013, MSIS 2103, STAT 2023. Management principles and techniques of analysis. Decision making as applied to management systems, organizations, interpersonal relationships and production.

3122 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 components and dynamics of organizational behavior essential to any manager. Managerial applications stressed.

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.

Compensation Administration. Prerequisites: 3013, STA 2023, introductory course. Fundamentals of compensation such as the legislative environment, compensation theories, job analysis, job evaluation, wage structures and indirect compensation programs.

Organization Theory and Development. Prerequisite: 3123. The design of formal organizations with an emphasis on topics related to organizational and managerial effectiveness. Focuses on what is known about managerial and organizational effectiveness and how this knowledge may be applied.

Innovation and Technology Management. Prerequisite: 4313 or equivalent. Business applications of research, practice, and theory in the management of innovation and technology at the enterprise level. Essential tools, techniques, and methodologies required to manage the development and application of new product and process technologies, innovative services, and other innovations that enhance performance.

Leadership Dynamics. Prerequisite: MGMT 3123 or equivalent. Leadership applications in business management. Contemporary business challenges require managerial leadership at the highest order. Students will be exposed to the latest developments in leadership theory and research. A cornerstone of the course will be the emerging construct of transformational leadership. The course emphasizes reading, class discussions, experiential exercises, and project groups to facilitate learning.

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.

Conflict Resolution in Industry. Prerequisite: 3103. 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.

Advanced Human Resource Management. Prerequisite: 3313. Management of human resources at the organization level including employee relations, law and human resource planning.

Organizational Design and Research. Prerequisite: admission to MBA program or consent of MBA director. An analysis of research which integrates theory and design of organizations. Reviews empirical research findings and stresses methods of organizational analysis; design and modification of organizations.

Seminar in Organizational Behavior. Prerequisite: admission to MBA program or consent of MBA director. Current research on group behavior in organizations. Group processes and structural factors affect the interaction process and intra- and intergroup performance characteristics. Laboratory simulation and team research projects used to pursue advanced topics.

Seminar in Personnel Management. Prerequisite: admission to MBA program or consent of MBA director. Theory and application of methods used in managing human resources in public and private organizations. Function, methods and characteristics of a personnel program.

Management of Technology and Innovation. Prerequisite: MBA core courses or consent of instructor. Business applications of research, practice, and theory in the management of technology and innovation. To improve the effectiveness by which technologies are developed, implemented, and institutionalized. Emphasizes both management with advanced technologies and strategic management of technology.

Labor Relations and Collective Bargaining. Prerequisite: admission to MBA program or consent of MBA director. A first course in labor relations. The industrial relations system, collective bargaining, labor legislation, the economic effects of unionization, and other contemporary labor relations issues.

Advanced Organizational Behavior. Prerequisites: doctoral standing and consent of instructor. Theory and research focusing on individual and group behavior in organizations. Both classic and contemporary topics in organizational behavior, including work attitudes, motivation, job design, leadership, group processes, power and politics, and individual differences.

Advanced Policy and Strategy Formulation. Prerequisites: doctoral student status and consent of instructor. Seminar examining research concerning the content of overall organizational strategy and the process through which it is formulated.

Advanced Human Resource Management and Industrial Relations. Prerequisites: doctoral student status and consent of instructor. Selected topics in human resource management and industrial relations with emphasis on evaluation of research methods. Development of research proposals.

Advanced Organization Theory and Strategy Implementation. Prerequisites: doctoral student status and consent of instructor. Administrative task of implementing corporate and business strategies and extent to which organizational structure, technology, culture, leadership, politics, and reward systems affect that process. Development in organization theory which are relevant to strategy implementation.

Advanced Methods in Management Research. Prerequisites: doctoral student status and consent of instructor. Course examines issues in theory building and development, strategies for collecting behavioral research. At conclusion of course, student should be able to: develop research questions, develop appropriate measures for constructs to be tested, and design research study using various methodologies.

Business Computer Concepts and Applications. Prerequisites: 30 credit hours and MATH 1513. Computer concepts, terminology, and software applications. Overview of hardware and software components, file structures, management information systems, futuristic trends, data base management systems, systems analysis and design, and data communications. Introduction to database, spreadsheet, and word processing software application packages and application programming.

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.

Advanced Computer Programming for Business. Prerequisite: 2203. Advanced programming features are examined with an emphasis on the development of computer programs for business applications. File processing including magnetic tape sequential files, disk-indexed sequential files, and virtual storage applications are an integral part of the course. Subjects and techniques such as TSO, segmentation, debugging tools and procedures, and pertinent JCL are also studied and applied.

Production and Operations Management. Prerequisite: 3013. Production and operations management utilizing a management science approach. Management decision-making techniques and their application to problems in production and operations management. Examples of applicable techniques include linear programming and decision analysis.

Management Science Methods. Prerequisite: 3223. Deterministic operations research techniques applied to the resource allocation and operational problems encountered in accounting, marketing, finance, economics and management. Linear programming and network models.

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 measurement, game theory, Markov chains, queuing, simulation probabilistic forecasting and inventory, network models, and dynamic programming.

Business Systems Analysis. Prerequisites: 2103, 2203, 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 gathering and reporting activities and transition into system analysis and design.
Data Base Management. Prerequisite: 2103 or equivalent. Theoretical aspects and management applications of data bases, file organization, and data models, with emphasis on hierarchical network and relational structures. Discussion of storage devices, data base administration, and the analysis, design and implementation of data base management systems.

Systems Design and Development. Prerequisites: 3303, 4013. Business information systems design and development with coverage of essential systems analysis techniques. Theory and application of prototyping. Computer-aided software engineering (CASE) and fourth-generation language tools used to develop a functioning business information system. Project management and additional analysis, design and development topics.

Management Information Systems. Prerequisites: 3223 and an introductory course in computing. Design, operation and implementation of computer-based information systems for 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.

Applied Artificial Intelligence. Prerequisite: 2103 or equivalent. Managerial applications of artificial intelligence. Topics include an overview and survey of the major topics in artificial intelligence, such as neural networks, natural language processing, robotics, and vision; expert system concepts and strategies; evaluating tools and techniques; knowledge engineering methodology; building expert systems; project management for expert systems.

Management Systems Applications. Prerequisites: 3223 and a course in a scientific programming language. Development and implementation of complex computerized decision models. Projects include data-base utilization, optimization and report generation.

Computer-based Simulation Systems. Prerequisites: 3223, completion of lower-division mathematics requirements and a course in a scientific programming language such as FORTRAN, PL/1, or PASCAL. Discrete computer systems simulation using languages such as GPSS, GASP, or SLAM. Cases include queuing, layout planning and evaluation, and financial modeling.

Data Communication Systems. Prerequisite: 3303. Management orientation to decisions necessary in the development and control of data communications. Transmission service and equipment characteristics, network design principles, data communication software and federal regulatory policy affecting data communication.

Advanced Decision Theory for Management. Prerequisite: admission to MBA program or consent of MBA director. Case studies and examples involving decision analysis. Studies taken from current literature.

Advanced Management Science. Prerequisite: admission to MBA program or consent of MBA director. Advanced management science methods, with computer applications. Mathematical programming, simulation, forecasting, queuing, Markov processes.

Advanced Production and Operations Management. Prerequisites: 5313 or equivalent; admission to MBA program or consent of MBA director. Production system, including a synthesis of production and management techniques used by operations managers. A computerized management simulation game provides decision-making experience.

Advanced Management Information Systems. Prerequisites: 5313, BUSAD 5003, ACCTG 5103, STAT 3013: admission to MBA program or consent of MBA director. Design and use of management information systems in businesses and other organizations. Model building, information resource management and decision support systems.

Decision Support and Expert Systems. Prerequisite: BUSAD 5003 or equivalent. Technical and managerial issues involved in the evaluation, acquisition and implementation of advanced technologies, such as decision support systems, expert systems, artificial intelligence, executive information systems, neural networks and others.

Advanced Data Base Management. Prerequisites: 4253 or equivalent and admission to MBA program or consent of MBA director. Advanced theoretical and practical foundations. Brief review of classical issues surrounding design, analysis, and implementation of data bases, both from a micro and a mainframe perspective. Current and emerging issues in the data base field. Analysis, design, and implementation of distributed data bases, the object orientated data model paradigm, the use and management of automated design and support tools (e.g., CASE) from a data base perspective, and data security.

Advanced Topics in Management Information Systems. 3-6 credits, maximum 6. Prerequisites: doctoral student status and consent of instructor. Special advanced topics in management information systems for doctoral students.

Manufacturing Technology (MFGT)

Welding Processes. Lab 3. Welding processes, their basic principles, and the changes in mechanical properties that occur in welded structures. Application of oxygases, metal arc, inert gas and other welding processes. Problems affecting the strength and other mechanical properties of welded structures.


Welding Applications. Lab 3. Prerequisite: 1432. The applications of various welding methods to the fabrication of welded structures. Weldability of metals, selection of filler material, surfacing materials and the techniques required to make and test welds.

Advanced Machining Principles. Lab 3. Prerequisites: GENT 1222, 1103; MATH 1613. Primary metal removal operations involving various machine tools. Metrology/quality, process selection, cost evaluation and optimization of cutting parameters; cutting tools used and forces generated.


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.

Advanced Manufacturing Problems. 1.4 credits, maximum 4. Prerequisites: senior standing and consent of instructor. Special problems in manufacturing.

Computer Integrated Manufacturing. Prerequisites: GENT 1103, 1222, MATH 1613. Introduction to programming techniques and manufacturing applications of Computer Numerical Control (CNC). Machine capabilities and tooling requirements, with programs being prepared manually and with computer assistance.

Applied Robotics and Automated Manufacturing. Lab 3. Prerequisite: ECT 3003 or ECT 3103. Industrial applications of computer-controlled robots and other automated manufacturing equipment. Emphasis on machine characteristics, techniques of efficient utilization and control, and evaluation criteria.


Advanced Metallurgical Problems. Prerequisites: 3343 and MECDT 4004. Problems in metallurgy; failure analysis, heat-treating problems and selection of metals for structural and environmental conditions.

Tool Design. Lab 3. Prerequisite: ECT 3433, MECDT 2213. Basic design and development of special tools for processing or manufacturing engineering materials. Design and specification of jigs, fixtures, assembly, fabrication and inspection tools using appropriate techniques of engineering graphics and analysis.

Marketing (MKTG)

Marketing. Prerequisite: ECON 2023. Marketing strategy and decision-making. Consumer behavior, marketing institutions, competition and the law.

Consumer and Market Behavior. Prerequisite: 3213. Qualitative and quantitative analyses of the behavior of the consumer system. Project marketing consideration of the contributions of economics and the behavioral disciplines to consumer behavior.
### Master of Business Administration (MBA)

**5010** Independent Study. 3-6 credits, maximum 6. Prerequisite: admission to MBA program or consent of MBA director. Investigation of advanced research topics or directed study under the supervision of a faculty member. Consent of MBA Graduate Studies Committee required.

**5011** Financial Tools: An Overview for Managers. Prerequisite: admission to MBA program. Introduction for managers to concepts and terminology of accounting, economics and finance.

**5021** Personal Computer Tools: An Overview for Managers. Prerequisite: admission to MBA program. Introduction for managers to concepts and terminology of personal computer tools and concepts. Work group support systems such as spreadsheets, word processing and electronic mail.

**5031** Quantitative Tools: An Overview for Managers. Prerequisite: admission to MBA program. Introduction for managers to quantitative tools used in business decision making.

**5010** Information Systems Technologies for Managers. Prerequisite: 5021. Use of various information systems resources available to managers. Database management systems, Internet and telecommunications networks.

**5112** Managing Individual and Group Performance. Prerequisite: admission to MBA program or consent of MBA director. Development of skills for managing individuals and small groups in an organizational context. Motivation, goal setting and rewards, leadership styles, conflict resolution, and team building.

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**3432** Promotional Strategy. Prerequisite: 3213. Promotional policies and techniques and their application to selling problems of the firm.

**3473** Professional Selling. Prerequisites: 3213, 3323, 3433. Skills to understanding the professional selling process. Strong emphasis on the communications function of personal selling. Lecture sessions combined with experiential exercises and role playing.

**3513** Sales Management. Prerequisite: 3213. Sales planning and control, organization of the sales department, developing territories, motivating salesperson and control over sales operations.

**3613** Retailing Management. Prerequisite: 3213. Applied marketing knowledge, with attention given to those concepts and methods which provide the necessary foundation for a retailing manager.

**4113** Marketing Decision Analysis. Prerequisite: 3213. Decision making in a variety of marketing applications to include model building, analysis of courses of action, and development of online information systems. Applications with microcomputers to focus on decision areas such as sales forecasting, media selection, sales force allocation and site location.

**4223** Business Logistics and Channel Management. Prerequisites: 3213 and MGMT 3223. An economic and operational analysis of the physical flow of goods and materials. A system interpretation of marketing channels.

**4333** Marketing Research. Prerequisites: 3213 and STAT 3013. Basic research concepts and methods. Qualitative and quantitative tools of the marketing researcher.

**4433** Problems in Marketing. Prerequisite: 3213. Problems in marketing. Specific topics vary from semester to semester.

**4443** Social Issues in the Marketing Environment. Prerequisite: 3213. Social and legislative considerations as they relate to the marketplace.

**4553** (International Marketing. Prerequisite: 3213. The conceptual framework for marketing into and from foreign countries. The development of action-oriented strategies with emphasis on the uncontrollable factors that affect marketing decisions in an international setting.

**4683** Managerial Strategies in Marketing. Prerequisite: 90 credit hours including 9 credit hours of marketing. Analysis of the marketing management decision process; market opportunity analysis, strategy development, planning and integration with corporate strategy.

**5213** Services Marketing. Prerequisite: 5133. Services and services marketing with emphasis on services research and services management.

**5220** Seminar in Marketing. 3 credits, maximum 9. Prerequisite: 5133. Selected topics in marketing. Industrial marketing, product management, strategic marketing planning, international marketing, and services marketing.

**5313** Marketing Research Methodology. Prerequisite: 5133. Research methodology applied to marketing problems. Measurement, survey research, experimentation, and statistical analysis of data.

**5553** International Marketing Strategy. Prerequisite: 5133. An analysis of marketing in the global environment. Environmental effects on international marketing management and corporate strategy decisions.

**5613** Seminar in Consumer Behavior. Prerequisite: 5133 or consent of instructor. Psychological, sociological, and anthropological theories related to consumer decision processes. Special emphasis on current empirical research in consumer behavior.

**5713** Seminar in Promotional Strategy. Prerequisite: 5133. Promotional problems encountered by a firm and approaches to their solution.

**5813** Seminar in Channels of Distribution. Prerequisite: 5133. Development structure and interrelationships among members of marketing channels involving customer service, physical distribution decisions, and operating policies.

**6413** Advanced Marketing Research. Prerequisite: 5313. Introduction to the latest empirical marketing research techniques. Data collection and analysis techniques such as conjoint analysis, multidiimensional scaling, path analysis, and structural equations modeling (via LISREL).

**6513** Seminar in Marketing Theory. Prerequisite: 5133 or consent of instructor. Development of an evaluation of marketing theory.

**6683** Seminar in Marketing Strategy. Prerequisite: 5133 or consent of instructor. Examination of a broad range of marketing management topics from a strategic perspective. Understanding of content, theory and research methods involved in the development of strategic marketing knowledge.

**6913** Measurement and Experimental Design. An analysis of measurement issues from both psychometric and marketing perspectives. Scale construction and validation. The design, analysis, and evaluation of marketing experiments.

### Mass Communications (MC)

**5000** Thesis. 1-6 credits, maximum 6. For mass communication graduate students who are candidates for the master's degree.

**5010** Specialized Mass Communication. 1-3 credits, maximum 3, Lab 4. Advanced message preparation in candidate's field of concentration.

**5113** Methods of Research in Mass Communication. Principles and techniques of research; research planning, design and measurement in mass communication.

**5223** Mass Communication Research Analysis and Interpretation. Prerequisite: 5113. Single- and multi-variate analysis, interpretation and reporting of mass communication research data. Use of computers in research analysis.

**5333** Process and Effects of Mass Communication. Mediating factors that affect interaction of ingredients in the communications process, and how these factors can affect the fidelity of information conveyed.

**5663** Public, Educational and Instructional Television. Uses of non-commercial television in public, educational and instructional applications. Analysis of program types and content.

**5733** Responsibility in Mass Communication. Interaction between mass media and society, with emphasis upon the communicator's ethics and responsibilities.

**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: JB 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 Johnsen, Korzybski, Hayakawa, Chase and Lee in relation to communication media.
5122 Marketing Decisions for Management. Prerequisite: admission to MBA program or consent of MBA director. Exploration of marketing role in organizations through an examination of the significant marketing decisions required of management. Strategic and tactical decisions, marketing’s relationship to business and society, and environmental influences.

5132 Internal and External Accounting Information for Decision Making. Prerequisite: 5011. Development of the ability to read and analyze internal and external financial statements and other financial reports. Use of accounting information to make business decisions.

5142 Economic Perspectives for Managers. Prerequisite: 5011. Application of microeconomic theory to managerial decision making. Understanding of government’s role in the regulation of business and industry.


5161 Managing Information Systems. Prerequisite: 5011. Composition, development and management of information systems for organizational use. Decision support systems, executive information systems, expert systems and their uses. Organizational issues concerning information systems design and development.

5172 Research Methods for Business Decision Making. Prerequisites: 5021, 5031. Application of analytical techniques to decision making. Methods to summarize, analyze, and make inferences from business and industry data.

5182 Quantitative Modeling for Decision Support. Prerequisites: 5021, 5031. Use of modeling techniques to assist managers with decision making. Models illustrated through application to real-world business problems. Understanding advantages and limitations of the methods.

5192 Managing Operations and Decision Processes. Prerequisite: 5172. Study of concepts of management of production and service operations. Contemporary manufacturing technologies and application of quantitative techniques. Development of analytical skills required to conduct detailed investigations of real-world systems.


5221 Public Environment of Business. Prerequisite: admission to MBA program or consent of MBA director. Survey of the external forces that influence and shape the organizational environment. Strategies for forecasting, responding to, and influencing these forces.

5241 Managerial Communication Skills. Prerequisite: admission to MBA program or consent of MBA director. Identification and analysis of interactive corporate communications: oral, written and interpersonal. Application of communication theories to business situations with the goal of behavior and skill development.

5281 Strategic Concepts. Prerequisite: admission to MBA program or consent of MBA director. Examination of corporate strategy formulation and environmental influences on strategy. Concepts used for analysis and development of corporate strategy. Interplay between strategy and the organization.

5261 Legal Issues in Business. Prerequisite: admission to MBA program or consent of MBA director. Analysis of the basic concepts of public and private law related to business decisions. Overview of the laws affecting private business relationships including employment law, agency laws, and various forms of business organizations.

5303 Integrative Decision Making I: The Corporate View. Prerequisites: consent of MBA director and completion of minimum of 15 MBA credit hours. Integration of knowledge and skills developed in MBA functional courses. Strategic decision making within the context of the firm’s internal and external environments.

5310 Integrative Decision Making II: Crossing Organizational Boundaries. 2-6 credits, maximum 6. Prerequisites: consent of MBA director and completion of minimum of 24 MBA credit hours. Identification and analysis of environmental forces affecting an organization’s ability to compete and survive. Interaction among all corporate functional units. Development of a comprehensive, integrated plan of action for the firm.

5400 Business Practicum. 1-3 credits, maximum 3. Prerequisites: consent of MBA director and completion of 18 MBA credit hours. Application of knowledge and skills developed in MBA functional courses in an organizational environment. Integration of functional concepts, allowing students to experience the adaptation of concepts to fit organizational reality, and assisting students in understanding ways in which their academic training can help organizations.

Mathematics (MATH)

0123 Intermediate Algebra. Prerequisite: one year of high school algebra or equivalent. Review of fundamental operations of algebra, rational expressions, exponents and radicals, linear and quadratic equations, inequalities, introduction to analytic geometry. Does not count for college credit. Graded on a satisfactory-unsatisfactory basis.

1314 General College Mathematics. Topics from set theory, logic, and probability. 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.

1613 (A)Trigonometry. Prerequisites: 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 1613 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. Combined credit for 1513, 1613, and 1715 limited to six hours. No credit for those with prior credit in any course for which 1613 is a prerequisite. Satisfies the six hour general education Analytical and Quantitative Thought area requirement.

2103 (A)Elementary Calculus. Prerequisite: 1513. An introduction to differential and integral calculus. For students of business and social sciences.

2123 (A)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.

2133 (A)Calculus for Technology Programs II. Prerequisite: 2123. 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.

2145 (A)Calculus I. Prerequisites: 1715, or 1513 and 1613. An introduction to derivatives, integrals and their applications, incorporating introductory analytic geometry. Satisfies the six hour general education Analytical and Quantitative Thought area requirement.

2155 (A)Calculus II. Prerequisite: 2145. A continuation of 2145 including multivariate calculus, series and applications. Satisfies the six hour general education Analytical and Quantitative Thought area requirement.


2413 Arithmetic for Teachers. Foundations of arithmetic for the elementary teacher.

2513 Structural Concepts for Teachers. Prerequisite: 2413 or equivalent. Structures of the number system and informal geometry. For the elementary teacher.

2603 Finite Mathematics. Prerequisite: 203. Discrete probability, vectors and matrices and linear programming. For students of business and social sciences.
Ordinary Differential Equations II. Prerequisite: 5243. Stability and asymptotic behavior of systems of nonlinear differential equations, Liapunov Theory, perturbation and the Poincare-Bendixon theory for planar autonomous systems, bifurcation, basins and attractors, chaotic behavior, and invariant tori.

Complex Analysis I. Prerequisite: 4143. Basic topology of the plane, functions of a complex variable, analytic functions, transformations, infinite series, integration and conformal mapping.

Complex Analysis II. Prerequisite: 5283. Riemann Mapping Theorem, meromorphic functions, analytic continuation, Dirichlet problem, and entire functions.

General Topology. Prerequisite: 4143 or consent of instructor. Basic properties of topological spaces and continuous functions, including connectedness, compactness, and separation and countability axioms. Metric, product, and quotient spaces, Urysohn lemma, and Tietze extension theorem.

Differential Geometry. Prerequisite: 4013 or 4143. Differential manifolds, vector fields, differential forms, connections, Riemannian metrics, geodesics, completeness, curvature, and related topics.

The Calculus of Variations and Optimal Control. Prerequisite: 4023 or 4143. Extrema of integrals depending on unknown functions. Euler conditions, Hamilton-Jacobi equations, Weierstrass E-function, Pontryagin maximum principle, bang-bang controls, feedback, stochastic problems and Kalman-Bucy filter.

Numerical Analysis for Differential Equations. Prerequisites: 4513 or COMSC 4513, and 4233. Advanced machine computing, algorithms, analysis of truncation and rounding errors, convergence and stability applied to discrete variables, finite elements, and spectral methods in ordinary and partial differential equations. Same course as COMSC 5543.

Numerical Analysis for Linear Algebra. Prerequisites: 3013, and 4513 or COMSC 4513. Advanced machine computing, algorithms, analysis of rounding errors, condition, convergence, and stability applied to direct and iterative solutions of linear systems of equations, linear least squares problems, and algebraic eigenvalue problems, including LU and QR factorization, conjugate gradients, QR algorithm, and Lanczos method. Same course as COMSC 5553.


Methods of Applied Mathematics. Prerequisites: 2233, 4013, and knowledge of computer programming. Continuous and discrete techniques in modern applied mathematics. Positive definite matrices, eigenvalues and dynamical systems, discrete and continuous equilibrium equations, least squares estimation and the Kalman filter, potential flow, calculus of variations, network flows, and combinatorics.

Algebra I. Prerequisites: 4613. A rigorous treatment of classical results in group theory and ring theory.

Algebra II. Prerequisite: 5613. A rigorous treatment of classical results in module theory and field theory.

Automata and Finite State Machines. Prerequisites: 3613 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, and recursive function. Same course as COMSC 5653.

Computability and Decidability. Effectiveness, primitive recursivity, general recursivity, recursive functions, equivalence of computability, definitions, decidability, recursive algorithms. Same course as COMSC 5663.


Advanced Seminar in Mathematics. 1-3 credits, maximum 12. Prerequisite: consent of instructor and student’s advisory committee. Directed reading on advanced topics in mathematics.


Functional Analysis I. Prerequisites: 4613 or 5023, 5153, 5303. Theory of topological vector spaces including metrizability, consequences of completeness, Banach spaces, weak topologies, and convexity.

Functional Analysis II. Prerequisite: 6143 or consent of instructor. Introduction to and basic results in several subfields of analysis which employ functional analytic methods. Topics from bounded and unbounded operator theory, Banach algebras, distributions, Fourier analysis, and representation theory.

Harmonic Analysis. Prerequisites: 5153, 5283. Classical results giving connections among the size of a harmonic or analytic function on a complex domain, the existence and smoothness of its boundary values, and behavior of the Fourier series; selected extensions, related topics and applications.


Several Complex Variables. Prerequisite: 5293. Elements of function theory of several complex variables, including extension phenomena, domains of holomorphy, notions of convexity, holomorphic maps, and complex analytic varieties.

Topics in Analysis. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in analysis.

Algebraic Topology I. Prerequisite: 5313. Chain complexes, homology and cohomology groups, the Poincare-Steenrod axioms, Mayer-Vietoris sequences, universal coefficient theorems, the Eilenberg-Zilber theorem and Künneth formulas, cup and cap products, and duality in manifolds.

Algebraic Topology II. Prerequisite: 6323. Homotopy groups, the Hurewicz and Whitehead theorems, Eilenberg-MacLane spaces, obstruction theory, fibrations, spectral sequences, and related topics.

Topics in Topology. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in topology.

Algebraic Geometry. Prerequisite: 5623. Affine and projective varieties, dimension, algebraic curves, divisors, and Riemann-Roch theorem for curves.

Complex Geometry. Prerequisite: 5283. Complex manifolds, analytic sheaves, differential forms, Dolbeault cohomology, Hodge theory, line bundles, divisors, Kodaira embedding, and vanishing theorems.

Topics in Geometry. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in geometry.

Theoretical Numerical Analysis. Prerequisites: 5153, 5543 or COMSC 5553, and 5553 or COMSC 5554. An advanced theoretical treatment based on function spaces and operator theory of algorithms for machine computing and analysis of errors.

Topics in Applied Mathematics. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in applied mathematics.

Commutative Algebra. Prerequisite: 5623. Commutative rings, exactness properties of modules, tensor products, integral dependence, chain conditions, completions, filtrations, local rings, dimension theory, and flatness.

Homological Algebra. Prerequisite: 5623. Closed and projective classes, resolution and derived functors, adjoint theorem, construction of projective classes in the categories of groups, rings and modules; categories, Abelian categories.

Topics in Algebra. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in algebra.

Analytic Number Theory. Prerequisites: 4283 or 5283. Arithmetic functions, Zeta and L functions, distribution of primes and introduction to modular forms.

Algebraic Number Theory. Prerequisite: 5013 or 5623. Number fields, ideal theory, units, decomposition of primes, quadratic and cyclotomic fields, introduction to local fields.

Topics in Number Theory. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in number theory.
6813 Lie Groups and Representations. Prerequisites: 4153, 4613, 5303. Differentiable manifolds, vector fields, Lie groups, exponential map, homogeneous spaces, representations of compact Lie groups, and maximal tori.


6890 Topics in Representation Theory. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Advanced topics in representation theory.

Mechanical and Aerospace Engineering (MAE)

3033 Engineering Design. Prerequisites: 3403, INDEN 3503. Design methodology and practice. Design process, with emphasis on the broad range of technical, economic, and societal factors considered in design decision making. Designing and building a machine to participate in a design competition.

3043 Mechanics of Machinery. Prerequisites: ENGS 2122, MATH 2233; co-requisite 3403. The kinematics and kinetics of rigid bodies subjected to planar and spatial motion; vector and matrix methods. Euler's equations to examine gyroscopic motion. The design of gears and gear trains; Analytical design of cam profiles. Multi-degree of freedom machine systems through the application of the Lagrange equation.

3113 Measurements and Instrumentation. Lab 3. Prerequisites: 3403, co-requisite 3723. Application of basic electronic laboratory measurement equipment. Selection and testing of transducers for measurement of displacement, time frequency, velocity, pressure, force, temperature, flow-rate, and vibration, for machine design applications. Considerations of accuracy, uncertainty and repeatability. Design projects involving the use of analog and digital integrated circuits and construction of prototype sensors. Practice in the use of signal processing including digital filtering and applications of Fast Fourier Transform theory. Practice in the use of computer-based data acquisition systems. Preparation of formal reports, including the presentation of plots, figures and tables.

3123 Manufacturing Processes. Prerequisites: ENGS 2142 and ENGS 3313 or equivalent. An introduction to manufacturing processes including the fundamental processes of casting, forging, rolling, extrusion, drawing and metal cutting. Quantitative relationships to identify important parameters which influence a given process.

3223 Thermodynamics II. Prerequisite: ENGS 2213. A continuation of ENGS 2213. Irreversibility and availability; power cycles, refrigeration cycles, mixtures and solutions, chemical reactions, phase and chemical equilibrium, and introduction to compressible flow.


3293 Compressible Fluid Flow. Prerequisites: ENGS 3233 and MATH 2233. Gas flows in one and two dimensions. Basic thermodynamic and dynamic equations. Nozzle and duct flows, choking, plane and oblique shock waves, Prandtl-Meyer expansions, rocket propulsion, frictional high-velocity flows and heat addition effects. Two-dimensional ideal fluid flow, stream function, velocity potential, linearized flows and method of characteristics.


3723 Dynamic Systems I. Prerequisites: ENGS 2122, 2613 and MATH 2233. Physical and mathematical modeling of electrical and mechanical dynamic systems. Transient response of first- and second-order systems, linearization, fast Fourier transform techniques for solving differential equations; transfer functions, frequency response and resonance.

4010 Mechanical Engineering Projects. 1-6 credits, maximum 6. Lab variable. Prerequisite: consent of instructor. Special projects and independent study in mechanical engineering.

4053 Automatic Control Systems. Prerequisite: 3113. Properties of feedback control systems, mathematical models of basic components, state-variable models of feedback systems, design specifications of control systems, time-domain analysis, stability, stability robustness, transform analysis, frequency domain techniques, root-locus, design of single-input-single-output systems and compensation techniques for engineering systems.

4053 Mechanical Vibrations. Prerequisites: 3043 and 3723. Lumped parameter analysis of multi-mode vibrating systems. Analysis techniques including classical analytical methods, matrix methods and numerical methods. Selection and design of vibration isolation systems. Selection of vibration instrumentation. Machine dynamics, including balancing, whir, nonlinear effects, and self-excited vibrations.

4133 Mechanical Engineering Applications. Lab 6. Prerequisites: 3112 and consent of instructor. Application of mechanical engineering laboratory techniques to the solution of experimental or design problems. Provides outstanding senior students with the opportunity to do research under close faculty supervision. Projects selected in consultation with the instructor.

4143 Advanced Materials and Processes. Innovation of advanced materials and processing, building U.S. strengths for maintaining a competitive edge in the market place. Utilizing the U.S. Patent Depository in the OSU Library to research selected areas of advanced materials and/or processing. Student inventions or invention possibilities. Highly interactive, with extensive group discussions.

4223 Experimental Aerodynamics. Lab 3. Prerequisites: 3113, 3253, 4233. Experimental study of fundamental aerodynamic principles for internal and external flow-fields. Aerodynamic characteristics of airfoils and the finite wing as well as internal and ducted flow. Application of low-speed wind tunnel testing techniques along with state-of-the-art instrumentation, diagnostics, and computerized data acquisition/analysis. Flight test evaluation of performance, stability, control, and handling qualities of a propeller-driven airplane.

4243 Gas Power Systems. Prerequisites: 3223 and ENGS 3233. Power and propulsion engines utilizing a gas as the working fluid. Thermodynamic and dynamic equations of one-dimensional compressible flow, including shock waves. Design and analysis of overall aircraft engine systems and individual components of the aircraft engine, as well as engine component matching, using design software packages. Centrifugal and axial flow turbines and compressors.

4263 Vapor Power Systems. Prerequisites: 3223, 3233. Vapor power cycles, combustion processes applied to power production, power plants, and auxiliary systems associated with power plants. Overall design of power plants as well as component design. Power system economics and loan analysis. Extensive use of software design and analysis packages.

4273 Experimental Fluid Dynamics. Lab 3. Prerequisite: 3223 and ENGS 3233. Experimental study of basic and applied fluid dynamics systems with comparisons to analytical predictions. Fluid dynamics instrumentation, digital data acquisition and processing, design of facilities and experiments, technical report writing and design project with experimental verification.


4323 Design for Manufacturing. Lab 3. Prerequisites: 3123, 3233, ENGS 3313. Integration of concepts of product design with manufacturing principles, including process analysis and properties of material, stress analysis, heat transfer and lubrication. Processing techniques and economics. Emphasis on analysis requirements and applications of processing parameters and design variables, in CAD/CAM.

Design Projects. Lab 4. Prerequisites: 3033, 3113, 3323, 4533 or 4703 or 4733. Design and testing of projects and senior-level design project sponsored by a company, agency, or individual. Teams work with mentors and faculty members in fields related to their topics. Presentations on safety, patent law, product liability, report writing, oral presentations, scheduling and ideation. Oral presentations, progress reports, and a professional log documenting personal activity and contributions.

Mechanical Design II. Prerequisites: 3033, 3123 or 4333, 3323. Design of power transmission systems, including belts, chains, and gears. Selection and application of hydraulic and pneumatic components in machine design applications. Selection of electric motors, actuators, encoders, and related electromechanical components. Design practice in the form of short projects integrating segments of the course.

Experimental Methods in Design. Lab 6. Prerequisites: 3112 and 3323. Laboratory techniques for the experimental analysis of vibration, stress, force and motion. Projects involving the use of strain gages, brittle lacquer techniques, reflection and transmission polarisocopes, load cells and accelerometers.

Aerospace Systems Design. Lab 4. Prerequisites: 3033, 3113, 4243, 4283, 4513, 4533 or 4703 or 4733. Multidisciplinary conceptual and technical problems encountered in aerospace systems. Focus on the design of systems in actual or simulated industrial environments. Activities include application of design and testing procedures, economic evaluation and optimization, and written and oral reporting on one or more assigned projects. Activities must be approved in advance by the advisor.

Advanced Dynamics. Prerequisites: 3043, MATH 3013. Advanced treatment of analytical methods for rigid body motion with emphasis on multidimensional motion. 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.

Advanced Mechanical Vibrations. Prerequisite: 4063 or consent of instructor. Analysis of nonlinear vibrations, classical analysis of continuous systems and numerical methods.

Engineering Acoustics. Acoustical analysis and measurement techniques, with emphasis on design applications for noise and vibration control in machinery and buildings.

Numerical Engineering Analysis. Prerequisite: basic FORTRAN programming. Practical digital methods for obtaining steady-state and transient solutions to lumped and distributed mechanical, fluid and thermal problems.

Metal Cutting. Prerequisite: ENGSC 3313. Understanding the fundamental principles and practice (mechanics and material aspects) of machining and grinding of materials. Historical aspects; physics of metal cutting, mechanics of machining (orthogonal and oblique); shear stress and shear strain in material undergoing deformation, dynamometer tool materials, tool wear, tool life, and machinability; vibrations in machining; thermal aspects of machining, cutting fluids; economics; surface finish accuracy and surface integrity, and grinding.

Mechanical Behavior of Materials. Prerequisite: ENGSC 3313 or equivalent. A unified approach to the behavior and response of engineering materials to applied loads. Mechanical and metallurgical fundamentals of deformation processes. Spatial scales of atomic physics, micromechanics and continuum mechanics.
Lubrication, Friction and Wear. Prerequisite: ENGSC 3233. Theories of lubrication, friction and wear; fundamentals of viscous fluid flow; the Navier-Stokes equations; Reynolds equations; hydrodynamic theory and applications to fixed, pivoted and thrust plane-slider bearings, journal bearings, disks, gears; optimization of bearing performance; hydrodynamic squeeze theory and applications; analysis of hydrostatic bearings; gas lubrication; solid friction and theories of adhesion and abrasion.

Fluid Power Control I. Prerequisite: 4053 or concurrent enrollment. Static and dynamic modeling of hydraulic and pneumatic control systems and components. Energy and power transfer and impedance matching concepts. Dynamic performance and stability of open- and closed-loop servodrives. Introduction to system design.

Automatic Control I. Prerequisite: 4053 or ECEN 4413. Input output and state space representations of linear continuous and discrete time dynamic systems. Controllability, observability, and stability. Design and analysis of single- and multi-variable feedback control systems. Introduction to identification, adaptive, and optimal control.

Digital Data Acquisition and Control. Lab 2. Prerequisite: undergraduate course in programming. Use of microcomputers and software to interface with digital, analog, and real-time systems. Common lectures with COMSC 4683.

Software Design for Real-time Distributed Systems. Prerequisite: 5483 or consent of instructor. Fundamental concepts associated with the design of software for implementation on distributed computer systems using real-time operating systems. Parallel computing in a real-time environment and control algorithm design. State-of-the-art boards including analog-to-digital and digital-to-analog equipment and newest computer-aided software engineering tools.


Analysis of Structural Systems. Prerequisite: 4513. Computer-oriented matrix methods in the analysis of linear structural systems; energy principles; matrix equations for static and dynamic analyses of elastic systems; stability.


Fatigue and Fracture Mechanics. Prerequisite: 4353 or consent of instructor. Fracture processes in engineering materials including design considerations, failure avoidance and predictability. Fatigue processes and high-strength, toughness-imitated materials. Same course as CIVEN 5553.


Corrosion Engineering. Lab 2. Prerequisite: ENGSC 3313. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service.

Applied Thermodynamics. First and Second Law analysis. Prediction of properties of non-ideal fluids, including mixtures. Engineering applications to power system design, solar systems, HVAC systems, waste heat recovery and underground petroleum reservoirs.

Nonlinear Systems Analysis I. Prerequisite: 4053 or ECEN 4413. Failure of superposition; phase plane and phase space techniques; method of perturbations; Sbiribol; subharmonic generation; generalized approaches to nonlinear systems analysis.


Fuzzy Systems Theory and Application. Prerequisite: 5723 or ECEN 5723. Fuzzy set theory: basic definitions, operations with fuzzy sets and fuzzy relations; extension principle; fuzzy functions; possibility theory; fuzzy systems; fuzzy models; fuzzy identification; approximate reasoning; fuzzy control and stability of fuzzy systems; fuzzy neural networks. Same course as ECEN 5773.

Artificial Intelligence and Expert Systems. Prerequisite: 5723 or ECEN 5723. Fuzzy set theory: basic definitions, operations with fuzzy sets and fuzzy relations; extension principle; fuzzy functions; possibility theory; fuzzy systems; fuzzy models; fuzzy identification; approximate reasoning; fuzzy control and stability of fuzzy systems; fuzzy neural networks. Same course as ECEN 5773.

Advanced Thermodynamics I. Prerequisite: 3223. A rigorous examination of the fundamental principles of engineering thermodynamics; the First Law, the pure substance, flow processes, Second Law availability, properties of substances, thermochemistry, mixtures and equilibrium.

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.

Conduction Heat Transfer. Prerequisite: ENGSC 3233. Advanced heat transfer analysis and design with primary emphasis on conduction.

Advanced Indoor Environmental System. Prerequisite: 4703. Heating, cooling, and ventilating systems. System and component design, building thermal simulation and energy calculation procedures.

Ideal-fluid Aerodynamics. Prerequisites: 3253 and knowledge of FORTRAN, or consent of instructor. Principles of inviscid, incompressible flow. Small disturbance theory for flow about airfoils and wings, and three dimensional panel methods. Introduction to unsteady and compressibility effects.
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 engineering drawings. Geometric construction in two dimensions and three dimensions, automated dimensioning, and section practices using ANSI standards.

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, flow charting, C Programming Language, spreadsheets and graphs. Emphasis on solving problems common to engineering technology.

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.

3003 Dynamics. Prerequisites: GENT 2323 and MATH 2123. Plane motion of particles and rigid bodies. Force-acceleration, work-energy, and impulse-momentum principles. Graphical analysis, mechanisms and vibrations.


3123 Product Design. Lab 5. Prerequisites: 1843 and GENT 1222. Industrial design functions and techniques, the creative process in product design innovations and improvements, human factors (person/machine interface) and techniques in graphic and model presentations of design concepts.

3152 Structural Fabrication Design. Lab 3. Prerequisite: 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 2123. 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.

4003 Machine Design I. Prerequisites: 3323 COMSC 2113, and MATH 2123. Applications of statics and strength to the design of machine components. Problems of choosing materials, impact and fatigue loading.


4505 Advanced Mechanical Design Problems. 1-4 credits, maximum 4. Prerequisite: junior standing and consent of instructor. Special problems in mechanical design.

4123 Senior Design Projects. Lab 6. Prerequisites: 3123, 4003 and ENGL 3323. Selected problems in design integrating principles of drafting, analysis, materials and manufacturing. Design projects are typically supplied by industry.

4203 Machine Design II. Lab 6. Prerequisites: 3323, COMSC 2113, and MATH 2123. 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.

4313 Applied Fluid Mechanics. Prerequisites: 2313, MATH 2123, 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 measurement, flow forces, lift and drag.


3433 Basic Thermodynamics. Prerequisite: concurrent enrollment in MATH 2123. Basic scientific principles of energy and the behavior of substances as related to engines and systems. Gas laws, vapors and engine cycles.
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.

2313 Surveying. Lab 3. Prerequisite: MATH 1613. A study of the equipment and practices used in surveying for small areas. Common practices of plane surveying; differential, profile, and topographic leveling; field notes, accuracy and precision, error and error control, and land measurement.


4050 Advanced Technology Problems. 1-4 credits. maximum 6. Prerequisites: junior standing and consent of department head. Special technical problems in a mechanical power area.

4223 Indoor Heating and Cooling Technology. Prerequisite: 3433. Indoor heating and cooling systems, psychometrics, load calculations, equipment selection, operation, and sizing.


4443 Power Station Technology and Design. Prerequisite: 3433. Steam, hydro and internal combustion power plants; technical design, energy balance and economic evaluation.

4453 Advanced Internal Combustion Engines. Prerequisites: 3114 and 3433. Advanced internal combustion engine theory; real cycles, mixtures, combustion, balancing and associated engine systems.

4462 Thermodynamics Laboratory. Lab 6. Prerequisite: 3433. Application of thermodynamic principles to vapor power cycles and gas power cycles.

4473 Senior Design Project. Prerequisite: senior standing. Lab 6. Selected problems in design, combining principles of drafting, analysis, materials and fabrication methods. Design projects typically supplied by industry.

2313 Surveying. Lab 3. Prerequisite: MATH 1613. A study of the equipment and practices used in surveying for small areas. Common practices of plane surveying; differential, profile, and topographic leveling; field notes, accuracy and precision, error and error control, and land measurement.


4050 Advanced Technology Problems. 1-4 credits. maximum 6. Prerequisites: junior standing and consent of department head. Special technical problems in a mechanical power area.

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4473 Senior Design Project. Prerequisite: senior standing. Lab 6. Selected problems in design, combining principles of drafting, analysis, materials and fabrication methods. Design projects typically supplied by industry.

Medical Technology (MTCL)

4117 Clinical Microbiology. Lab 12. Prerequisites: concurrent internship in affiliated hospital, and all degree requirements for B.S. in medical technology with a concentration in 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. Prerequisites: concurrent internship in affiliated hospital, and all degree requirements for B.S. in clinical technology with a concentration in 30 hours MTCL. The theory and laboratory study of analytical biochemistry, clinical microscopy, 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 with a concentration in 30 hours MTCL. Systematized study of diseases, cell maturation and function, principles of hemostasis; methodology used in routine and special hematology studies; and correlation of hematological findings with physiological conditions.

4203 Irrigation Principles. Prerequisite: MATH 1513. Selection, measurement and efficient use of irrigation vessels. Selection of pumping plants and power units. Layout and management of surface and sprinkler systems.

4211 Machinery Calibration. Lab 4. Prerequisites: 1413, MATH 1513. Analysis of the metering function, calibration, and management of agricultural planting, fertilizing, and pesticide application equipment.

4212 Safety and Health in Agribusiness. Lab 2. Prerequisite: junior standing or above. Study of the causes and prevention of accidents in agribusinesses. Investigations including the acute and chronic risks of machinery, animals, gases, confined spaces, outdoor and hazardous materials.
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 Topics in Medical Technology. Prerequisites: concurrent internship in affiliated hospital, and all degree requirements for B.S. in medical technology except 30 hours MTCL. Principles and practices of the medical laboratory including basic management, quality assurance, education methodology, computer applications, laboratory safety, and special projects in selected areas.

Microbiology (MICRO)

2124 Introduction to Microbiology. Lab 4. Prerequisites: one year of chemistry, and BIOL 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 Molecular and Microbial Genetics. Prerequisites: 2124, BIOL 3024 and one semester of organic chemistry. The properties of macromolecules, from the structure of proteins and nucleic acids to molecular mechanisms of DNA replication and recombination, transcription, protein synthesis, and gene regulation. Gene transfer mechanisms in bacteria and their viruses. Fundamentals of recombinant DNA technology.

3134 Pathogenic Microbiology. Lab 3. Prerequisite: 2124. Examination of pathogenic bacteria as they relate to humans, other animals, plants and insects. Same course as PLP 3134.

3143 Medical Mycology. Lab 4. Prerequisite: 2124. Examination of fungi as animal pathogens; laboratory techniques used in the identification of human and animal pathogens, and differentiation from common contaminants.

3153 Medical Parasitology. Lab 2. Prerequisite: introductory biology. Human and parasitological problems including endemic, exotic and zoonotic organisms. Life cycles, diagnosis and control procedures. Principles applicable to all areas of zoology, medicine, veterinary medicine and medical technology.

3154 Food Microbiology. Lab 4. Prerequisites: 2124 and organic chemistry. Relationship of microbiology to food manufacture and preservation, to food spoilage and microbial food poisoning and to various aspects of human food production. Same course as ANSI 3154.

3254 Immunology. Lab 3. Prerequisite: 2124.Vertebrate host's ability to defend itself against foreign intrusion. Chemistry and biology of the acquired immune response. Same course as CLMOL 3254.

4000 Honors in Microbiology. 1-4 credits, maximum 10. Prerequisite: permission of departmental honors committee. Supervised study and research in microbiology.

4113 Microbiology of Soil. Lab 6. Prerequisite: 2124. Microorganisms of the soil and their relationship to soil fertility.

4123 Virology. Lab 4. Prerequisites: BIOL 3014 or one course in biochemistry and one upper-division MICRO course. Virus-host interactions including structure-function of animal, plant and bacterial viruses. Discussion of the molecular biology of virus infection and development. Same course as CLMOL 4123.

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.


4264 Biotechnology. Lab 2. Prerequisites: 4224 or BIOCH 3653 or BIOL 3014; and MICRO 3133 and 4142 or consent of instructor. An indepth exposure to the practical application of biological principles. Classical and modern (genetic engineering) biotechnology, within a framework involving the identification of a problem or need, determination of a solution or product, strain development, scale-up technology, and product recovery or process enhancement. Same course as CLMOL 4264.

4320 Bioenergetics. Prerequisites: BIOCH 3653, BIOL 3014 or BOT 3463. Bioenergetic reactions and mechanisms involved in energy production in plants, animals, and microbial systems. Same course as CLMOL 4320.

4737 Modern Microbiology. Prerequisite: senior standing. A capstone course describing recent advances in microbiology, integrating various subfields of microbiology, and discussing the impact of the field on problems of our society (social, political, economic and environmental).

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. 2-6 credits, maximum 6. Prerequisite: consent of major professor. A student studying for the M.S. degree enrolls in this course for six hours credit.

5113 Advanced Immunology. Prerequisite: 3254. Advanced studies with emphasis on the regulation of vertebrate immune responses.

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 Molecular Genetics. Prerequisites: 3133 and 4142 or concurrent enrollment and BIOCH 3653 or BIOL 3014. Structure, function and recent scientific of nucleic acids. Gene transfer mechanisms, genetic recombination and plasmid biology. Emphasis on recent developments in recombinant DNA technology.

5160 Seminar. 1-5 credits, maximum 2. Required of all graduate students majoring in microbiology.

5960 Special Problems. 1-4 credits, maximum 10. Prerequisite: permission of instructor. Investigations in the field of microbiology.

6000 Dissertation. 1-15 credits, maximum 45. Prerequisite: consent of major advisor. Research in microbiology for the Ph.D. degree.


6120 Recent Advances in Microbiology. 1-3 credits, maximum 6. Prerequisite: one graduate course in biochemistry. Discussion and evaluation of recent scientific contributions in terms of the living organism.

6143 Current Topics in Microbial Physiology. Lab 3. Prerequisite: 4224 or consent of instructor. Discussion of current literature in microbial physiology with emphasis on critical analysis of research papers.

6253 Microbial Evolution. Prerequisites: 2124, BIOCH 3653, BIOL 3024. The mechanisms and results of microbial evolution in nature and in the laboratory with emphasis on microbes as model evolutionary systems, molecular evolution, classification and phylogeny, and discussion of probobiology and the probable fate of engineered microbes.

Military Science (MILSC)

1000 Introduction to Military Skills. 1 credit, maximum 2. Lab 2. Prerequisites: enrollment in 1112 and 1212. Introduction of military skills, such as rappelling, drill and ceremony, land navigation, individual first aid, individual training in small unit tactics. Practical exercises in patrolling, immediate action drills, raid and ambush techniques. Some laboratories will be on selected weekends.

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 responsibilities of the military officer. Reserve Officers Training Program and methods of commissioning. Exposure to military skills such as rappelling and first aid.
212 Leadership. Leadership theories, leader and follower roles, principles and traits of leadership, communications, problem solving, motivation, and self-development. Taught through group discussion and practical exercises in leadership skills.

2122 Basic Camp. Lab 2. Military training and performance in leadership and training environment for six weeks.

2130 Military Physical Conditioning. 1 credit, maximum 2. Lab 2. Prerequisite: must be enrolled in MILSC theory classes. Theory and practice of physical conditioning instruction, based on the U.S. Army physical training program, designed to develop cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition.

2233 Leadership and Military Skills I. Lab 2. Leadership and individual military skill development: instruction in land navigation, marksmanship; first aid; individual skill training in rappelling, communications, physical fitness, and leadership. Taught through a combination of classroom instruction and outdoor practical application exercises. Some laboratories will be on selected weekends, by arrangement.

2313 Leadership and Military Skills II. Lab 2. Prerequisite: 2233. Leadership, management and military skill development. Includes theory and tactics for military operations; individual skill training in rappelling and patrolling through a combination of classroom instruction and outdoor practical application weeks by arrangement.

2333 Fundamentals of Military Operations. Lab 2. Prerequisite: placement by department head. Course geared for leadership and individual military skills development. Taken in lieu of 2233 and 2313 with department head approval. Theory and tactics for military operations taught through classroom lecture and outdoor practical application exercises. Some laboratories will be on selected weekends, by arrangement.

3113 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 candidates for advanced camp and eventual commissioning as an officer in the U.S. Army. Some laboratories will be on Saturdays, by arrangement.

3223 The Platoon Leader II. Lab 2. Prerequisites: completion of lower-division ROTC program or basic ROTC summer camp or equivalent, qualification by physical and aptitude standards set by Department of the Army and approval of PMS. Platoon defensive operations, controlling communications, land navigation and map reading, branches of the Army and the officer personnel management system. Some laboratories will be on Saturdays, by arrangement.

4014 Advanced Summer Camp. Lab. Prerequisites: 3112 and 3223. Military training and performance as leaders for six weeks.

4223 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.

1090 Secondary Harpsichord. 1-2 credits, maximum 8.


1100 Elective Harpsichord. 1-2 credits, maximum 8.

1110 Elective Organ. 1-4 credits, maximum 8.

1120 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.
2021 Piano Class Lessons. Prerequisite: 2011 and music major status. Successful completion of the course fulfills piano proficiency examination requirement for music majors (non-keyboard concentration).

2041 Vocal Techniques. Prerequisite: 1031. Assists non-vocal majors in understanding the physical and psychological processes required for correct singing tone production.


2061 Low String 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: 1320.

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.

2450 Major Harpsichord. 1-4 credits, maximum 8. Prerequisite: 1450.

2551 Sightseeing and Eartraining III. Prerequisites: 1541 and 1543. Further development of skills in sightseeing 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 sightseeing, melodic and harmonic dictation and keyboard skills. Taken concurrently with 2551.

2561 Sightseeing and Eartraining IV. Prerequisites: 2551 and 2553. A continuation of 2551. Taken concurrently with 2563.

2573 (H)Introduction to Music. Instruments, musical forms and styles, and major composers from the 16th century to the present. For non-majors; no prior musical experience required.

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 8.

2672 Fundamentals of Music. Accepted for certification in elementary education. Fundamentals of music, sightseeing, and piano keyboard. No credit for students with prior credit in 1592.

2682 Music Education. Prerequisite: 2672. For certification in elementary education. Methods of teaching music in grades K-6.

3100 Elective Harpsichord. 1-2 credits, maximum 8.

3110 Elective Organ. 1-4 credits, maximum 8. Prerequisite: 1110.

3120 Elective Piano. 1-4 credits, maximum 8. Prerequisite: 1120.

3130 Elective Voice. 1-4 credits, maximum 8. Prerequisite: 1130.

3140 Elective Brass. 1-4 credits, maximum 8. Prerequisite: 1140.

3150 Elective String. 1-4 credits, maximum 8. Prerequisite: 1150.

3160 Elective Woodwind. 1-4 credits, maximum 8. Prerequisite: 1160.

3170 Elective Percussion. 1-4 credits, maximum 8. Prerequisite: 1170.

3180 Secondary Organ. 1-2 credits, maximum 8. Prerequisite: 1180.

3190 Secondary Piano. 1-2 credits, maximum 8. Prerequisite: 1190.

3200 Secondary Voice. 1-2 credits, maximum 8. Prerequisite: 1200.

3210 Secondary Brass. 1-2 credits, maximum 8. Prerequisite: 1210.

3220 Secondary String. 1-2 credits, maximum 8. Prerequisite: 1220.

3230 Secondary Woodwind. 1-2 credits, maximum 8. Prerequisite: 1230.

3240 Secondary Percussion. 1-2 credits, maximum 8. Prerequisite: 1240.

3250 Major Organ. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2250.

3260 Major Piano. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2260.

3270 Major Voice. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2270.

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 Harp. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2320.

3330 Major Saxophone. 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.
### Music 277

- **Prerequisites:** Upper-division examination, 2410.

- **Description:** Studies in diagnostic, laboratory experiences in music. Prerequisite: declared intent to pursue T

- **Secondary Harpsichord:** 1-4 credits, maximum 8.

### Music 3763

- **Prerequisites:** 1513, 1533 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.

### Music 3772

- **Prerequisites:** 2563 and satisfactory upper-division examination. Analysis and application of contrapun

### Music 3773

- **Survey of Jazz Styles:** Elements and stylistic features of jazz, its evolution and its impact on society.

### Music 3783

- **Form and Analysis:** Prerequisites: 2563 and satisfactory upper-division examination. Analysis of standard repertory with emphasis on form and structural harmonic analysis.

### Music 3832

- **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.

### Music 3842

- **Marching Band Methods:** Prerequisite: 3731. Organizational responsibilities and charting for public school marching bands.

### Music 3901

- **Junior Recital:** Prerequisites: junior standing and consent of major applied music teacher.

### Music 4021

- **Piano Class Lessons:** Prerequisite: senior music major status.

### Music 4031

- **Solo Literature for the Adolescent Singer:** Examination of solo literature and pedagogical approaches suitable for use at the high school level.

### Music 4100

- **Music Industry Internship:** Prerequisites: 90 credit hours and minimum 2.5 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.

### Music 4250

- **Major Organ:** 1-6 credits, maximum 12. Prerequisites: 3250 and successful completion of recital attendance requirements.

### Music 4260

- **Major Piano:** 1-6 credits, maximum 12. Prerequisite: 3260 and successful completion of recital attendance requirements.

### Music 4270

- **Major Voice:** 1-6 credits, maximum 12. Prerequisite: 3270 and successful completion of recital attendance requirements.

### Music 4280

- **Major Violin:** 1-6 credits, maximum 12. Prerequisite: 3280 and successful completion of recital attendance requirements.

### Music 4290

- **Major Viola:** 1-6 credits, maximum 12. Prerequisite: 3290 and successful completion of recital attendance requirements.

### Music 4300

- **Major Cello:** 1-6 credits, maximum 12. Prerequisite: 3300 and successful completion of recital attendance requirements.

### Music 4310

- **Major Double Bass:** 1-6 credits, maximum 12. Prerequisite: 3310 and successful completion of recital attendance requirements.

2123 (N)Principles of 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.

3113 Science of Food Preparation. Lab 3. Prerequisites: HRAD 1113, organic chemistry. Application of scientific principles to food preparation. Same course as HRAD 3113.

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.

3223 Nutrition in the Life Cycle. Prerequisite: 2123. Nutritional needs and dietary concerns of individuals from conception through old age.

3440 Nutritional Sciences Preprofessional Experience. 1-3 hours, maximum 3. Supervised work experience in one or more of the following: college and university food service, health care facilities, and food processing plants.

3543 (LS)Food and the Human Environment. Impact of the various factors which affect food availability, production, processing, distribution and consumption of food in the world. Challenges and solutions to the world food crisis.

3553 Purchasing in Hospitality and Food Service Systems. Prerequisite: 3133 or concurrent enrollment. Procurement of food and nonfood materials in hospitality and related industries. Same as HRAD 3553.

3652 Food Conservation and Preservation. Lab 3. Prerequisites: 3133, organic chemistry, microbiology. Modern methods and principles of food conservation and preservation including freezing techniques; laboratory experience with different methods.

4013 Experimental Foods. Lab 6. Prerequisite: 3133 or consent of instructor. Investigations in physical, chemical and sensory qualities of foods under experimental conditions. Development of an individual research project.

4323 Human Nutrition and Metabolism. Prerequisite: 2123 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: ACCTG 2203, junior standing. Menu analysis and food/beverage/labor cost controls associated with hospitality industry operations. Same course as HRAD 4333.

4365 Quantity Food Production Management. Lab 5. Prerequisites: HRAD 2124, HRAD or NSCI 3133, 3553 and a course in accounting or mathematics or consent of instructor. Organizing, purchasing, costing, preparation and service of food in a quantity food production setting. Same course as HRAD 4365.

4373 Creative Teaching of Nutrition. Prerequisite: 2123 or equivalent. Analyses of various methods, techniques, resources and evaluation for nutrition education. Experiential component required.

4573 Institution Organization and Management. Lab 3. Prerequisites: NSCI or HRAD 3553, 4365. 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.

4643 Critical Issues in Nutrition and Dietetics. Prerequisite: senior standing. The capstone course in nutritional sciences that integrates the body of knowledge of nutrition and dietetics with general education through the examination of critical issues in nutrition and the practice of dietetics.

4733 Community Nutrition. Prerequisites: 2123 and an educational methods course. Application of nutrition, education and communication principles to community nutrition programs and services. Field work required.

4850* Special Unit Studies in Nutritional Sciences. 1-3 credits, maximum 6. Special units of study in nutritional sciences.

4853 Medical Nutrition I. Lab 2. Prerequisites: 4323 or concurrent enrollment, one course in biochemistry. Physiological and metabolic bases for dietary modifications in disease states. Interpretation of laboratory data as it applies to nutritional care.

4863 Medical Nutrition II. Lab 2. Prerequisite: 4853. A continuation of 4853.

5000 Research in Nutritional Sciences. 1-6 credits, maximum 6. Prerequisite: consent of adviser. Individual research and thesis that will fulfill the requirements for the master's degree.

5012 Public Policy Development in Food, Nutrition and Related Programs. Rationale underlying selected governmental programs in food and nutrition and other home economics areas and assessment of the effectiveness of the programs.

5113 Investigational Cookery. Prerequisite: 4013. Food science, food quality and physical characteristics of food.

5123 Research Developments in Nutritional Sciences. Basic components of the research process and application of research methods to nutritional sciences.

5220 Contemporary Issues in Diabetics. 1-2 credits, maximum 2. Prerequisite: acceptance as a dietetic intern. Contemporary issues in the practice of dietetics; formulation of innovative solutions and processes to enhance effectiveness in the workplace. Graded on a pass-fail basis.

5233 New Findings in Nutrition. 1-3 credits, maximum 6. Prerequisite: 1113. Current emphases in nutrition, with implications for nutrition research, education, and public service.

5233 Quantity Food Development. Lab 5. Prerequisite: 4365 or equivalent. Experimental approach to methods in quantity food production as related to time factor, institution equipment and proportions of ingredients.

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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.

Nutritional Sciences (NSCI)

2111 Professional Careers in Dietetics. Career opportunities in dietetics. Roles, responsibilities and professional expectations of dietetics professionals. Routes to professional memberships and current issues in professionalism.
5343 Organization and Management of Food Service Systems. Prerequisite: 4573 or equivalent. Contemporary theories of organizational structures as applied in the management of food service systems.

5342 Maternal and Infant Nutrition. Prerequisite: 2123 or equivalent. Nutritional needs and dietary concerns during pregnancy, lactation and the first year of life. Implications for nutrition intervention and education.

5353 Childhood Nutrition. Prerequisite: 2123 or equivalent. Nutritional needs of children, preschool through elementary school years. Dietary implications of child care, school food service and parent education.

5383 Nutrition for the Adolescent and Young Adult. Prerequisite: 2123 or equivalent. Nutritional needs and dietary concerns during adolescence and young adulthood. Implications for nutrition education and research.

5393 Nutrition for the Elderly. Prerequisite: 2123 or equivalent. Nutritional needs, and dietary concerns of the elderly. Implications for food and nutrition programs, policies, research and education.

5440 Dietetic Internship Practicum. 1-6 credits, maximum 9. Prerequisites: acceptance as a dietetic intern and American Dietetic Association verification. Supervised learning experiences in approved facilities for the achievement of performance requirements for entry level dietitians. Graded on a pass-fail basis.

5462 Food Service Layout and Equipment. Prerequisite: HRAD 4472. Food service layouts and specifications for institutional equipment.

5463 Advanced Human Nutrition. Prerequisites: a biochemistry course and an upper-level nutrition course. Application to the human being of metabolic processes which involve essential dietary components.

5531 International Nutrition and World Hunger. Prerequisite: consent of instructor. Advanced study of the magnitude, causes, and nature of hunger and undernutrition in low income countries; emphasis on programs, policies and planning directed toward alleviating hunger.

5563 Nutritional Assessment. Prerequisites: 3223, 4323, or equivalent. Dietary, physical, and biochemical assessment techniques and their application to patient or client nutritional status assessment in health care systems.

5593 Quality of Work Life in Food Service Organizations. Prerequisite: one course in personnel management. Analysis of administrative problems in food service organizations. Focus on quality of work life assessment.

5643 Advanced Clinical Nutrition. Prerequisite: admission to AP4 or consent of instructor. Physiological and metabolic bases for nutritional support in critical care.

5650 Advanced Food Conservation and Processing. 2 credits, maximum 2. Lab 3. Prerequisite: 4013. Recent advances in food processing in relation to quality of product and conservation of food nutrients.

5673 Food Service Systems Manpower Management. Lab 3. Principles and practices of management in the procurement, development, maintenance and utilization of an effective and satisfied working force in food service systems.

5713 Community Dietetics. Prerequisites: 4373, 4753 or equivalent. Analysis of factors that have an impact on community nutrition programs and development of skills in planning, promoting and delivering quality community nutrition services.

5743 Experimental Methods in Nutritional Sciences. Prerequisites: a course in biochemistry, a course in statistics, a graduate course in food or nutrition. Experimental design for research in food and nutrition based on analytical laboratory techniques and other research methodology.

5753 Administrative Dietetics. Prerequisite: completion of DPD-ADA requirements or consent of instructor. Evaluation of food service systems in health care institutions, schools, cafeterias and restaurants. Personnel and financial management, marketing and public relations in food and nutrition related industries.

5850 Special Topics in Nutritional Sciences. 1-3 credits. Prerequisite: graduate standing. Specialized workshops in nutrition, food science or food service administration.

5870 Problems in Nutritional Sciences. 1-4 credits, maximum 6. Analysis of emerging problems and trends in nutritional sciences.

5960 Seminar in Nutritional Sciences. 1 credit, maximum 2. Prerequisite: for M.S. students. Individual and group seminars on current issues and research in nutritional sciences.

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 Macronutrients in Human Nutrition. Prerequisite: 5463 or consent of instruction. In depth study of vitamins and minerals and their interrelationships in metabolism.

6233 Critical Analysis of Current Issues in Food Service Administration. Prerequisites: 5593, 5673. Current issues in food service administration with emphasis on total quality management, robotics, solid waste management and research needs.

6870 Independent Study in Nutritional Sciences. 1-3 credits, maximum 6. In-depth analysis of research issues in nutritional sciences.

6960 Advanced Studies in Nutritional Sciences. 1 credit, maximum 3. Critical evaluation of research in nutritional sciences. Individual and group seminars on selected topics.

OCCUPATIONAL AND ADULT EDUCATION (OAED)

3012 Analysis and Assessment of Training Needs. Prerequisites: TECED 3103, TIED 3203, and full admission to Teacher Education. Techniques and procedures used in determining needs for, and content of, instructional 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.

3143 Career Education: An Introduction. Introduces current and prospective teachers to the fundamental concepts and operational practices of learning principles. Instructional planning, 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. Documentation and completion of 45 clock hours of observations in various school settings. Graded on a pass-fail basis.

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: full admission to Teacher Education. Applications of teaching and learning principles. Instructional planning, needs assessment, goals, implementation strategies, evaluation, developmental concepts, curriculum planning and articulation.


4213 Computers and Multimedia for Workplace Education. Lab 2. Prerequisite: basic knowledge of MS-DOS or consent of instructor. Overview of MS-DOS microcomputer applications in workplace education, including selection of hardware and software, databases, spreadsheets, authoring systems, Internet and other on-line databases, and multimedia applications. Same course as BUSPR 123.

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, facilities, teaching-learning theories, materials development, program resources and program and instructional evaluation.
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 and test ideas, theories and concepts learned in graduate study.

Petroleum Technology (PET)

1113 Introduction to Petroleum Industry. Lab 2. Prerequisite: MATH 1113 or one unit of high school algebra. Exploration, drilling, production, transportation and marketing.

1234 Petroleum Technology. 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; COMSC 2113; MATH 2133 (pre- 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: 1234; GENT 2323 (pre- or corequisite). Original completion of oil and gas wells. Design, sizing and selection of production equipment. Performance and interpretation of basic testing connected with oil and gas production. Solutions to routine production problems.


3223 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 transportation and storage.

3454 Petroleum and Natural Gas Unit Operations. Lab 2. Prerequisites: 3234; MATH 2133. Petroleum and natural gas operations are studied qualitatively and quantitatively. 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 2133; or consent of instructor. Reservoir mechanics, reservoir fluids, flow through porous media. Petroleum and gas reservoir measurements, analyses, evaluations and predictions.


4334 Advanced Petroleum Production. Lab 3. Prerequisites: 2333, 4224, and MECDT 3323. Remeasurement and workover operations on producing oil and gas wells. Analysis and design of artificial lift techniques. Well testing and problem well evaluation.

Philosophy (PHILO)

1013 (H)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)Logic and Critical Thinking. Formal and informal reasoning, common fallacies, definitions and language functions, patterns of explanation. Practical criticism and development of everyday arguments.

2113 Introduction to Philosophy. Selected philosophical problems: the nature of reality, knowledge, value, social ideals and religion.

3113 (H)SpD)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)Modern Philosophy. Major philosophers and problems in Western thought from the 16th through the 19th century. Emphasis on Descartes, Hume and Kant.

3300 (H)Philosophy and the Quality of Life. 1-3 credits, maximum 3. Series of self-paced, one-credit modules dealing with the arguments and values in controversial issues affecting the quality of life and persons and societies.

3313 (H)19th and 20th Century Philosophy. Major philosophers and problems in Western thought from Hegel to the present.

3413 (H)SpD)Ethics. Contemporary and classical views on the nature of moral judgements, moral value, relativity and objectivity, freedom and responsibility.


3533 (H)Philosophical Study of Marxism. The work of Marx and Engels and of selected later writers such as Kautsky, Lenin, and Gramsci.


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 uses, preferential treatment practices. Analytic grounding in basic theories of ethics.

3813 (H)Recent American Philosophy. Dominant trends in American philosophy during the last 100 years, with emphasis on pragmatism.

3823 (H)Engineering Ethics. Philosophical analysis of moral issues in engineering practice, such as whistleblowing, conflicts of interest and product liability. Professional codes of ethics.

3833 (H)Ethical Issues in Biology and Medicine. Moral problems brought about by recent developments in scientific research and medical technology. Abortion, euthanasia, genetic engineering, and human experimentation.

3913 (H)Existentialism. Selected writings and themes in the development of existentialism and related intellectual movements. Subjectivity, phenomenological 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)Philosophy of Education. 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 mortality.

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. Symbolic analysis and calculus of propositions. Applications in various fields.

4313 (H)Philosophy of Mind. Problems in philosophical psychology. Mind and body, freedom and determinism, personal identity and survival, self-knowledge, analysis of mental concepts.
Philo- 
The analysis of contemporary educational philosophy is a prerequisite for graduation with departmental honors. The writing of a major philosopher and related material. Theoretical and practical analysis related to the role of coach- ing, including practical aspects of performance, management and relationships, and management concerns such as drug abuse, stress, academic requirements and legal issues. The role of physics in other disciplines. Newtonian mechanics, fluids, heat, thermodynamics, waves, sound. No credit for students with credit in 1014. The role of physics in other disciplines. Newtonian mechanics, fluids, heat, thermodynamics, waves, sound. No credit for students with credit in 1014.  

Physical Education (PE)  
1753 Introduction to Physical Education. The nature, scope and significance of physical education. Historical and philosophical foundations, major sub-disciplines and their interrelationships, and career opportunities.  

1812 Pedagogy of Motor Skills I. Prerequisite: HPEL majors and minors only. Theory and practice of soccer, golf, volleyball and physical fitness; analysis and practice of skills in each area; basic rules and strategies.  

1822 Pedagogy of Motor Skills II. Prerequisite: HPEL majors and minors only. Theory and practice of basketball, weight training, softball, and archery; analysis and practice of skills in each area; basic rules and strategies.  

1832 Pedagogy of Motor Skills III. Prerequisite: HPEL majors and minors only. Theory and practice of track and field; gymnastics apparatus; gymnastics (floor), and social dance; analysis and practice of skills in each area; basic rules and strategies.  

1842 Pedagogy of Motor Skills IV. Prerequisite: HPEL majors and minors only. Theory and practice of badminton, folk and square dance, tennis, and rhythmic aerobics; analysis and practice of skills in each area; basic rules and strategies.  

2052 Sports Officiating. Current rules and techniques. Students who perform satisfactorily may apply for official ratings.  

2712 Psychomotor Development. Prerequisites: 1753 or concurrent enrollment; HPEL majors and minors only. Fundamental aspects of motor development for infants, children, youth and adults.  

3114 Physiology of Exercise. Lab 2. A study of the various bodily systems, including major organs and tissues, and how they respond to acute and chronic exercise of varying intensity, duration and frequency.  


3430 Early Laboratory and Clinical Experiences in Physical Education. 1-2 credits, maximum 4. Prerequisites: 1753 and declaration of intention to pursue a program in Teacher Education. The initial preprofessional clinical experience for schools, kindergarten through grade twelve with primary duties including instruction in physical education. Required for full admission to Teacher Education. Graded on a pass-fail basis.  

3663 Kinesiology and Biomechanics. Prerequisites: HLTH 2653; MATH 1513 or consent of instructor. A systematic approach to analysis of human movement through anatomical, mechanical, and kinesiological concepts. Quantitative and qualitative analysis related to kinematic and kinetic principles.  

3753 Methods in Teaching Elementary Physical Education. Prerequisites: 1753, 2712. Theory and practical experience of physical education in the elementary school. Teaching styles and activities needed to meet the needs of children from kindergarten through grade five.  

3773 Methods in Teaching Secondary Physical Education. Lab 2. Prerequisites: 1812, 1822, 1832, 1842, 3663, and 3753; or consent of department head. Instructional styles, implementation of behavioral goals and objectives through unit and lesson preparation, teaching methods, and classroom management.  

4480 Internship in Physical Education. 6-16 credits, maximum 16. Prerequisite: last-semester-senior year with cumulative GPA of 2.50. Supervised practical experience in physical education setting. Graded on a pass-fail basis.  

4723 Measurement and Evaluation in Health and Physical Education. Evaluation techniques commonly used by physical educators and health professionals to measure knowledge, attitudes, sport skill proficiency, and physical fitness.  

4732 Administration and Program Design in Physical Education and Athletics. Prerequisites: 3753, 3773 or concurrent enrollment; full admission to teacher education. Design and management of physical education (K-12) and athletic programs.  

4793 Adapted Physical Education. Lab 2. Prerequisites: 3663, 3753; or consent of department head. Characteristics of various handicapping conditions; adapting the physical education program to meet the needs of atypical students.  

4863 Theory of Coaching. Prerequisite: junior standing or 45 hours with 3.25 GPA. The role of coaching, including practical aspects of performance, management and relationships, and management concerns such as drug abuse, stress, academic requirements and legal issues.  

4972 Adapted Aquatics. Prerequisite: LEIS 3212 or consent of instructor. Mechanical principles, skill analysis, evaluation techniques, lesson and unit planning, and practical experience in teaching swimming to persons with mental and/or physical disabilities.  

Physics (PHYS)  
1014 (N)Descriptive Physics. A survey course presenting the basic concepts and principles of physics with a minimum of mathematics. Motion, waves, temperature, electricity, magnetism, optics, atomic structure, and nuclear energy. No credit for students with credit in 1114.  

1114 (L,N) 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.  

1214 (L,N) General Physics. Lab 2. Prerequisite: 1114. Continuation of 1114; electricity, magnetism, optics, quantum physics, atomic and nuclear structure.  


2413 Electronics. Prerequisite: 2114 or consent of instructor. AC circuits, vacuum tube and transistor amplifiers, oscillators and power supplies. Pulse and digital circuits.  

2520 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 2233 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 (N)Optics. Prerequisites: 2114 and 3513, or consent of the instructor. Geometrical optics; interference, diffraction, dispersion, absorption and polarization of light.
3313 (N)Modern Physics for Engineers. Prerequisite: 2114 or equivalent. Emphasis on nuclear, molecular and solid state physics with engineering applications.
3321 Laboratory I. Lab 3. Use of lasers, lens systems, spectroscopy, interferometry, interaction of light with matter, thermal physics, and wave propagation.
3513 (A)Mathematical Physics. Prerequisites: 1214 or 2114, and MATH 2155. Physical applications of vectors, vector calculus and differential equations. Fourier analysis. Orbit geometry, coordinate systems and transformation of coordinates. Matrices and determinants.
3522 Radioactivity and Nuclear Physics Laboratory. Lab 6. Prerequisite: 4683 or 4213 or concurrent enrollment. Basic measurement techniques in nuclear physics.
3621 Laboratory II. Lab 3. Laboratory experiments on atomic physics, electron interference, gamma ray spectroscopy, the photodetector effect, and nuclear resonance.
3713 Modern Physics I. Prerequisite: 2114. Atomic physics, special theory of relativity, and introduction to solid state and nuclear physics.
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 2233, 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 nonmajors majors. Fundamentals of nuclear physics with applications to chemistry, engineering and biology.
4263 (N)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; BIOL 1403 or 1603; CHEM 3015. Application of physical concepts to biological structures and processes. Interaction of light with biological materials, effects and radiation 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, stationary states, 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 processes; absorption, detection and measurement of radiations; nuclear transformations.
4712 Laboratory III. Lab 3. Laboratory experiments on electrical measurements and microcomputer applications to analysis and control of measurements. Advanced individual research projects.
4812 Laboratory IV. Lab 3. Continuation of advanced projects from 4712.
4813 Electromagnetic Radiation. Prerequisites: 3213, 3513, 4113. Electromagnetic wave theory, reflection and refraction of electromagnetic waves; resonant cavities, wave guides, fiber propagation of electromagnetic waves; radiation sources; relativistic description of electromagnetic fields.
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, with second faculty reader and oral examination. Required for graduation with departmental honors in physics.
5000 Master’s Thesis Research. 1-9 credits, maximum 9. Prerequisite: consent of major professor.
5110 Seminar. 1-5 credits, maximum 20. Prerequisite: graduate standing in physics. Special topics in physics.
5133 Theory of Spectra. Line spectra, hyperfine structure, Lamb shift, band spectra, NMR spectra and ESR spectra.
5213 Statistical Mechanics. Prerequisites: 5113 and 5613 or consent of instructor. Classical and quantum mechanical distribution functions for independent particles; interacting classical and quantum systems, superfluidity, phase transitions and critical phenomena, approximation methods.
5263 Nuclear Physics. Prerequisites: 5453 and 5613. Nuclear forces, structure of nuclei and nuclear models.
5313 Electromagnetic Theory. Prerequisite: 5453. Electric field and magnetic field in free space and in matter. Boundary value problems, Green’s functions, stress tensors, multipole expansions, thermodynamics; electromagnetic waves.
5350 Special Problems. 1-3 credits, maximum 3. Prerequisite: graduate standing in physics. Special problems of experimental or theoretical nature. Largely individual work with written report required.
5353 Membrane Biophysics and Bioenergetics. Prerequisites: 1214 and BIOL 3014 or BIOCH 4113 or CHEM 3354 or PHYS 3313. Applications 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 jotted with current research problems. Same course as ZOOL 5223.
5413 Classical Mechanics. Prerequisites: 3013 and 3413 or equivalent. Generalized coordinates and advanced dynamics; coupled systems, wave motion; theory of elasticity.
5453 Methods of Theoretical Physics. Prerequisite: 3513. Introduction to the various methods and techniques used in theoretical physics.
5513 Selected Topics in Acoustics. Prerequisites: 4423, 5453. Radiation, transmission and absorption of acoustic waves, acoustic impedance; high intensity effects; ultrasonics.
5613 Quantum Mechanics I. Prerequisite: 5453. Postulates of quantum mechanics. Operators, commutators, representations, Schroedinger, Heisenberg and interaction formalisms, angular momentum and central field problems; nondegenerate perturbation theory.
5653 Solid State Physics I. Prerequisite: 4823. Crystal structure, cohesive energy of ionic crystals and metals, specific heats, free electron theory of metals, band theory, Brillouin zones, insulators and alloys; magnetic properties, optical properties and thermal and electrical conductivity of solids.
5713 Solid State Physics II. Prerequisite: 5663 or equivalent. Symmetry, dielectric properties, ferroelectrics, magnetic properties, mechanical properties and defects of solids.
5913 Selected Topics in Astrophysics. Prerequisites: ASTR 2023 and 3023 desired but not mandatory. Derivation of fundamental equations and application to problems in astronomical spectroscopy, stellar atmospheres, stellar interiors, interstellar matter and radio astronomy.
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.
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.

5120 Veterinary Histology and Cytology. Lab 5. Prerequisite: first-year standing in College of Veterinary Medicine. 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.

5224 Integrative Vertebrate Cell Structure and Function. Prerequisites: BIOCH 3653; ZOOL 3204 or ZOOL 4215; consent of instructor. The relationship between structure and function underlying essential processes occurring within individual cells and in interactions among cells. Emphasis on integration of knowledge of morphology, metabolism, and physiology to illustrate a comprehensive understanding of the function of vertebrate organisms at the cellular level.

5225 Veterinary Gross and Developmental Anatomy II. Lab 8. Comparative and functional gross anatomy and development of domestic mammals. 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.

5234 Veterinary Physiology II. Lab 2. Prerequisite: 5134 or consent of instructor. Veterinary medical physiology of the renal, digestive, and neuro-endocrine physiology. Each part of this sequential course may be taken for two hours credit. Student should ascertain the topics before registering for this course a second time. Same course as ZOOL 6110.

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.

5336 Veterinary Pharmacology I. Prerequisite: second-year standing in the College of Veterinary Medicine or consent of instructor. Introduction of the principles of pharmacodynamics, drug disposition, pharmacokinetics, mechanisms of action, pharmacological effects, dosage considerations, and possible adverse effects of chemotherapeutic and anti-inflammatory agents. Appropriate selection of pharmacological agents used in the therapy of animal diseases and compliance with statutory and regulatory guidelines using a combination of didactic, cooperative, and problem-based learning.

5434 Veterinary Pharmacology II. Lab. 8 hours per semester. Prerequisite: 5335 or consent of instructor. A continuation of PHSI 5353 that includes the mode of action, toxicities and contraindications of corticosteroids, antacids, antispasmodics, sedatives, tranquilizers, anticonvulsants, analgesics, antiinflammatory drugs, diuretics, cardiaciotonics, autocoids, bronchodilators, local anesthetics and anesthetizing agents. In-depth focus on the pharmacology of the anti-infective drugs. Emphasis on the principles of pharmacology as they relate to the veterinary health care team.

6000 Research and Thesis. 1-15 credits, maximum 50. Prerequisite: consent of instructor. Independent research for the doctoral dissertation under the supervision of a graduate faculty member.

6110 Advanced Physiology of Selected Systems. 2-10 credits, maximum 10. Prerequisite: 5125 or ZOOL 4215. Advanced studies in gastrointestinal, cardiovascular, respiratory, excretory and neuroendocrine physiology. Each part of this sequential course may be taken for two hours credit. Student should ascertain the topics before registering for this course a second time. Same course as ZOOL 6110.

6343 Semiconductors II. Prerequisite: 6243. The second part of the semiconductors sequence. Transport phenomena, junctions, devices, heterostructures and optical properties.

6413 Quantum Mechanics II. Prerequisite: 5613. Scattering theory, many-particle quantum mechanics and application to atomic and molecular systems; degenerate and time-dependent perturbation theory.

6613 Advanced Nuclear and Particle Physics. Prerequisites: S263, 6313. Nuclear and elementary particle interactions, resonances, and models; relativistic quantum mechanics and quantum field theory.

6713 Statistical Theory of Fields. Prerequisite: 5313. Radiation theory, waveguides, scattering and dispersion relations; relativity.
Applied Veterinary Agronomics. 1-3 credits. Lab 2-6. Applications of soil-plant-animal interrelationships to the practice of veterinary medicine.

Problems in Functional Morphology. 1-3 credits, maximum 12. Lab 3-9. Prerequisite: consent of instructor. Investigations in comparative, gross, developmental or histologic morphology for graduate students.

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.

Seminar. 1-6 credits, maximum 6. Consideration of literature and research problems pertaining to physiological sciences.

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.

Plant Pathology (PLP)

Pathogen Microbiology. Lab 3. Prerequisite: MICRO 2124. Pathogenic bacteria as they relate to humans, other animals, plants and insects. Same course as MICRO 3134.


Plant Disease Control. Lab 3. Prerequisite: 3344 or concurrent enrollment. Disease-control theory and practices. Control practices and economics are considered in relation to principles and research results in the areas of quarantines, eradication, cultural practices, biological control, physical factors and chemicals.

Virology. Lab 4. Prerequisites: BIOL 3014 or one course in biochemistry; and one upper-division MICRO course. Theory and practice of virus host interactions including structure-function of animal, plant and bacterial viruses. Same as MICRO 4124.

Undergraduate Research. 1-3 credits, maximum 3. Prerequisite: consent of instructor. Undergraduate research projects in plant pathology.

Research. 1-6 credits, maximum 6. Research for the M.S. degree.

Plant Nematology. 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.

Plant Virology Laboratory. Lab 4. Prerequisite: previous or concurrent enrollment in 5013. Methods of investigating plant viruses.
3100 Political Science Internship. 1-6 credits, maximum 6. Prerequisite: consent of department. Internship education experience in a specific subfield in the discipline of political science.

3123 (I) Government and Politics of the Former Soviet Bloc. Political processes, governmental institutions and public policies of the successor states of the former USSR and selected Eastern European countries in the post-communism era.

3133 (I) Politics of Anglo-American Democracies. Political processes and governmental institutions of the United Kingdom, Ireland, Canada, Australia, and New Zealand with comparisons to the United States.

3143 (I) Politics of Western Europe. Political processes and governmental institutions of continental Western European states, with emphasis on France, Germany and Italy.

3173 (I) Politics and Administration in Mexico, Central America and the 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 America. Governmental institutions, administrative processes and contemporary trends in the politics of selected South American states, with special emphasis given to Argentina, Brazil and Chile.

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.

3243 Foreign Policies in the Former Soviet Bloc. The comparative foreign policies of the territories of the former "Eastern bloc" in the period following the revolutions of 1989-91. The resurgence of nationalism and the effects of defining and pursuing national self-interest on the foreign policies of Eastern European and former Soviet territories.

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 (S)Voting and Elections. Electoral systems and their relationship to political development, political socialization, issue emergence, voting patterns, and electoral cycles.

3453 (S,SpD) The Legislative Process. The power and organization of legislatures, as well as the selection and behavior of legislators. Special attention given to the U.S. Congress.

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 the executive branch; proposed reforms and the vice-presidency.

3493 Public Policy. Prerequisite: any one of 1013, 2033, 2113, ECON 1113, 2123, SOC 1113, PHILO 2113. Identification of policy options open to policy makers and examination of measurements and rationale underlying governmental programs.

3613 State and Local Government. Political processes, government and administration of American states, cities and counties; special emphasis on Oklahoma.

3683 (H) Political Thought. The teachings of the three lasting traditions of Western political thought: classical, Christian and modern.

3983 (S) The Judicial Process: Courts, Judges and Politics. The American judiciary and legal processes from a political perspective with particular emphasis on judicial organization and powers, recruitment, fact-finding, decision-making, impact of decisions, the legal profession and relations among courts. Oklahoma judicial organization.

4003 Political Analysis. Prerequisites: 60 credit hours, or 45 hours with GPA of 3.25, including 2113. Logic and techniques of modern political analysis, including the logic of political analysis, the collection and analysis of political information, and data processing and computer applications to the study of politics.

4013 American Foreign Policy. Major problems and politics of American foreign relations since World War II and description of foreign formulation and aid administration.

4053 (I) World Politics. Foreign policies of major powers, areas of tension and sources of international conflict.

4100 Problems of Government, Politics and Public Policy. 1-6 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 International Institutions. The organization, procedures, functions and role of international institutions, with emphasis on the United Nations and related agencies.

4133 International Organizations. The organization, procedures, functions and role of international institutions, with emphasis on the United Nations and related agencies.

4213 (S) 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 (S) Jurisprudence and Criminal Justice. An introduction to theoretical issues of public law and law enforcement, with emphasis upon criminal justice.

4353 (S) Administrative Law. Legal powers, limits, and procedures of administrative agencies with emphasis on federal and state administrative procedure acts.

4363 (S) Environmental Law and Administrative Law. Statutory law, case law, and administrative practices relating to regulation of the environment including environmental impact statements, pollution, public lands, and preservation law.

4403 (S) Urban Politics. Problems of governing American metropolitan areas.

4413 Government Budgeting. The politics, planning and administration of government budgets.

4453 (I) Public Personnel Administration. Problems, processes and procedures of public personnel administration.

4473 Comparative Public Administration. The nature and context of comparative administration. Theories concerning the political, social and cultural settings of administration and the study of specific administrative systems.

4513 (S,SpD) American Politics. Significant developments and issues in American politics, including American political behavior and political leadership.

4563 (H,SpD) American Political Thought. A survey of the major developments in American political thought from the Colonial period to the present, followed by a topical analysis of important recent theoretical developments in political science.

4583 (S) 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.

4653 (H,SpD) Contemporary Political Thought. An analysis of 19th and 20th century political ideas, with emphasis on the rise and fall of ideologies along side controversies over relativism, positivism, pragmatism, and resurgent religious faiths.

4663 Politics and Human Reason. An overview of past and present accounts of politics as a rational activity, with attention given to Aristotle, the Federalist, and modern social choice theory.


4 American Constitutional Law: Equal Protection of the Laws. Prerequisite: 2023 or 3983 recommended. Development of principles of constitutional law by the Supreme Court concerning individual and group rights, with particular emphasis on equal protection of the laws concepts in matters of race, gender, wealth, citizenship, legislative reapportionment and voting rights, government employment and affirmative action programs. Legal research techniques.

4783 American Constitutional Law: The Division of Governmental Powers. Prerequisite: 2023 or 3983 recommended. Development of principles of constitutional law by the Supreme Court concerning federalism and separation of powers with particular emphasis on political and doctrinal developments surrounding judicial review, regulation of commerce, taxing and spending and presidential power. Introduction to legal research methods.
5010 Quantitative Methods of Political Analysis. 1-6 credits, maximum 6. Required of all graduate students. Fundamental methodological issues in the scientific study of politics. Logic of science, principles of research design and computer data manipulation and analysis.
5020 Research in Public Administration, Public Policy and Politics. 1-6 credits, maximum 6. Individually supervised research.
5030 Internship in Public Administration and Government. 1-6 credits, maximum 6. Individually supervised internships in administrative and governmental career areas. Paper required.
5040 Readings in Politics, Public Policy or Public Administration. 1-6 credits, maximum 6. Prerequisite: consent of supervising professor. Readings in the student’s major area of study.
5100 Advanced Problems in Government, Politics, and Public Policy. 3 credits, maximum 6. Special seminar, topics vary from semester to semester.
5110 Seminar in Public Policy. 3-6 credits, maximum 6. Public policy process including policy design, implementation and change. Approaches to public policy including design science, rational choice, policy sciences, normative models, and institutionalism.
5113 Seminar in Public Program Evaluation. Methodology of evaluation research in public programs. Emphasis will be placed on designing and interpreting evaluative studies rather than the mastery of particular mathematical, statistical or computer skills.
5210 Seminar in International Relations. 3 credits, maximum 6. Research on the dynamics and institutions of international politics.
5213 Seminar in the International Political Economy. Prerequisite: graduate standing. Research on the economics and theories of interaction between economic and political phenomena.
5310 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.

Psychology (PSYC)

1113 (S)Introductory Psychology. Principles, theories, vocabulary, and applications of the science of psychology.
2313 Psychology and Human Problems. Prerequisite: 1113. Personality dynamics and their application to personal, cultural and vocational experience.
2593 Psychology of Human Sexuality. Prerequisite: 1113. Survey of behavioral, personality and psychophysiological components of human sexuality, with special emphasis on the delineation of facts from sexual myths.
3013 Psychology of Motivation. Prerequisite: 1113. Review of research and theory in such areas of motivation as hunger, sex, frustration, aggression, achievement, affiliation, and altruism.
3073 (N)Neurobiological Psychology. Prerequisites: 1113, 3212. Contemporary theoretical and methodological issues in social psychology with special emphasis on the social psychology of the experiment and experimentation with the social aspects of human behavior.
3443 (S)Abnormal Psychology. Prerequisites: 1113, and 60 credit hours or 45 hours with GPA of 3.25. The nature of pertinent studies, causes, and theories of human developmental phenomena across the life span.
3453 (S)Developmental Psychology. Prerequisites: 1113, and 60 credit hours or 45 hours with GPA of 3.25. A study of the development, theory and research of modern psychological perspectives on the religious experience.
3743 (S)Social Psychology. Prerequisites: 60 credit hours or 45 hours with GPA of 3.25. Theories and applications of social cognition, the self, prosocial and aggressive behavior, groups, attitudes and the environment.
3771 Careers and Professionalism in Psychology. Lab 1. Prerequisite: psychology major or 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 (S)Cognitive Psychology. Prerequisites: 1113, 3213 or equivalent. Cognitive processes. Thinking, problem solving, visual imagery, attention and memory search. Both theory and application emphasized.
3914 Experimental Psychology. Lab 4. Prerequisites: 1113, 3213 or equivalent and five additional hours in psychology. Problems, methods and applications of experimental psychology.
3990 Undergraduate Seminar. 1-6 credits, 6 maximum. Prerequisite: consent of instructor. For honors students and other outstanding students. Special topics in psychology.
4123 (S)Psychology of Women. Lab 1. Prerequisite: 1113. Sex differences and the development of sex role behavior. Encompasses the psychological dynamics of developmental and social issues for women.
5313 Quantitative Methods in Psychology II. Prerequisite: 5303. A continuation of 5303. Higher-order analysis of variance designs, correlation and regression techniques, and analysis of covariance, with emphasis on applications to psychological experimentation.

5333 Systems of Psychotherapy. Prerequisites: 5113; graduate standing in the clinical program of the Department of Psychology or consent of instructor. The major approaches to psychotherapy. Methods for creating multiple impact for behavioral change, including interpersonal, social, community and preventative interventions.

5380 Research. 1-12 credits, 12 maximum. Prerequisite: consent of instructor. Research project on some psychological problem.

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.

5660 Teaching Practicum. 1-2 credits, 2 maximum. Prerequisite: consent of instructor. Primarily for graduate students with well-defined new teaching responsibilities.

5823 Cognitive Processes. Theory and experimental research findings dealing with human thought processes from a developmental and functional standpoint.

6000 Dissertation. 1-16 credits, maximum 60. Research and report thereon by graduate students in partial fulfillment of requirements for the Doctor of Philosophy degree.

6083 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.

6133 Minority Issues. Prerequisite: six credit hours of psychology and consent of instructor. Social issues related to pluralism with emphasis on community and social psychology.

6143 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.

6173 Child Psychopathology and Treatment. Prerequisites: 3443, 3583 or equivalent; graduate standing in the clinical program of the Department of Psychology, the doctorate school psychology program or the psychometry program, or consent of instructor. Theoretical positions and issues in child psychopathology. Procedures used in the treatment of psychological disorders of children.

6223 Research Design. Prerequisites: 3914 and doctoral level standing. Experimental techniques in psychophysics, sensory processes, attention and perception, motivation and emotion, and learning and memory.
6523* Seminar in Human Development. Prerequisite: consent of instructor. Behavioral aspects of development from the prenatal period to senescence. Normal development contrasted to exceptional development.

6263 Personality Theories. Prerequisites: nine credit hours of psychology and consent of instructor. Various theories of personality.

6283 Factor Analysis. Factor analysis and implications for measurement of mental abilities, personality traits and learning.

6353 Psychology of Motivation. Prerequisite: 3914. Outline of theory and research in human and animal motivation.

6383 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.

6393 Psychology of Language. Review of data and theories of speech and language behavior. Laboratory techniques and experimental designs will also be reviewed to emphasize understanding of psycholinguistic research.

6413 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.

6433 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.

6443 Behavioral Medicine. Prerequisites: 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.

6483 Neurobiological Psychology. Prerequisite: 3073 and 3914 or consent of instructor. Physiological, neuroanatomical, and neurochemical underpinnings of human behavior. Emphasis on effects of central nervous system dysfunctions on behavioral processes ranging from sensation to concept formation.

6513 Group Treatment Methods. Prerequisite: graduate standing in the clinical program of the Department of Psychology or the doctoral 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. Skill development, professionalism, ethics and case management. Dynamics of co-therapy and joint treatment. Case consultation format. Same course as ABSED 6553.

6563* Advanced Social Psychology. Prerequisite: 3743. History, theory and experimentation of dynamic interaction of group membership and individual behavior.

6583 Developmental Psychobiology. Prerequisites: 3703 or equivalent; consent of instructor. An exploration of the biological aspects of human development, with particular emphasis on the physiological, ethological, and genetic perspectives.

6613 Experimental Learning Theories. Prerequisite: nine credit hours of psychology. Basic concepts and empirical findings in animal and human learning.

6640 Clinical Practicum. 1-12 credits, 17 maximum. Prerequisite: graduate standing in the clinical program of the Department of Psychophysiology. Practicum experience for graduate students in the clinical psychology program.

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.

6650 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.

6673* Neuropsychological Assessment. Prerequisites: 5054 or 6483, and 5064 and 5153, 6753; graduate standing in the clinical program in the Department of Psychology or consent of instructor. Psychological assessments of the effects of cerebral damage or disease.

6713* 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.

6723 Child Diagnostic Methods. Prerequisites: 5153, 5173; graduate standing in the clinical program in the Department of Psychology or the doctorate school psychology program, or consent of instructor. Administration and interpretation of diagnostic instruments used specifically with children.

6753 Objective Psychodiagnostic Methods. Prerequisites: 3443, 4813; graduate standing in the clinical program of the Department of Psychology or the doctorate counseling psychology program, or consent of instructor. Restricted to graduate students in programs designed to prepare students for the professional practice of psychology. Complex objective personality and interest tests and their diagnostic and clinical uses.

6883 Seminar in Psychological Testing. Prerequisites: 5153, 6713, 6753, and graduate standing in the clinical program of the Department of Psychology, or consent of the instructor. The administration, interpretation, and integration of projective and objective personality test data and intelligence test data with adult psychiatric patients.

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-psychological factors that influence persuasive attempts.

Religious 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.

3013 (H)The Old Testament and Its Study. A study of the Hebrew Scriptures with emphasis upon content, historical background, the history of its study and the critical analysis and theological interpretation of selected passages.


3243 (H)Paul and the Early Church. Recommended: 3023. The letters of Paul in their historical context with special emphasis on his theology and ethics.

3293 (H)History of Christianity. An intellectual and cultural history of Christianity from the second century to the present day.
2225 (l)Intermediate Russian II. Prerequisite: 2115 or equivalent. Continuation of 2115.

2325 Intermediate Russian III. Prerequisite: 2115. A continuation of grammar review and the development of skills in reading, writing, and speaking Russian.

3003 (L,S)The Soviet Union: History, Society and Culture. A comprehensive view of the Soviet Union, including the development of the country's economic, technological, geophysical and cultural situation. Accessible to beginning undergraduates. Same course as HIST 3003 and POLSC 3003.

3113 Russian Conversation. Prerequisite: 2225. Development of conversational skills in formal and informal Russian language; study of oral communication and idioms; vocabulary enhancement.

3123 (H)Russian Culture and Civilization. Art, literature, music, architecture, and contemporary life of Russia. Course taught in English.

3223 Russian Composition. Prerequisite: 2225. The development of all forms of written communication in Russian through practice in writing compositions, letters, reports and other documents in Russian.

4113 (H)Russian Literature in Translation I. Russian literature from its beginning to mid-19th century: Pushkin, Lermontov, Goncharov, Gogol, Turgeniev and Dostoevsky. Readings in English. Classes conducted in English.

4123 (H)Russian Literature in Translation II. Russian and Soviet literature from mid-19th century to present: Tolstoy, Chekhov, Gorky, Zamyatin, Sholokhov, Pasternak, Bunin, Solzhenitsyn, Arzhan (Daniel), Tertz (Sinyavsky), Voznesensky and Evtushenko. Readings in English. Classes conducted in English.

4253 Russian Language and Literature for an Educated Life. Prerequisite: 3113 or 3223. A survey of original literary texts by major Russian authors of the 19th and 20th centuries. Conducted in Russian. Capstone course.

Sociology (SOC)

1113 (S)Introductory Sociology. Coming to terms with the requirements for living in a complex world. Sociological concepts used to assist students in understanding the social influences in day-to-day life.

1123 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.

2113 Principles of Sociology. Prerequisites: 15 semester credit hours. The science of human society. Emphasis on basic concepts and research studies. Required of all sociology majors and minors.

2123 Social Problems. Exploration in selected social issues in contemporary American society, such as deviance, poverty, sexism, racism and ageism.


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 thought and the relevance of theory to sociological research.

3223 (S,SpD)Social Psychology. Social basis of personality development and behavior, including symbolic environment, self and group, motivation, attitudes and opinions, and social roles.

3373 (S)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 various national and international agencies and the effects on the culture, social relations, and social structures of Third World countries.

3413 Rural Sociology. Life in rural America and non-western societies examined with special emphasis on social relations, population movement, social change and problems of rural society.


3713 (H)Religion, Culture and Society. Recommended: 1113, 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 REL 3713.

3793 Russian Conversation. Prerequisite: 2115. Development of conversational skills in formal and informal Russian language; study of oral communication and idioms; vocabulary enhancement.

4050* Studies in Religion. 2-6 credits, maximum 6. Independent studies, seminars and courses on selected topics in religion.

4113 (H,I)The World of Islam: Cultural Perspectives. The cultural heritage of the world of Islam explored through its expression in the art, architecture and literature of the Muslim peoples.

4330 Seminar in Biblical Studies. 3 hours credit, maximum 9. Prerequisites: two courses in Biblical studies. Selected topics in the academic study of the Bible.

Russian (RUSS)

1115 Elementary Russian I. Lab 1 1/2. Understanding, speaking, reading and writing. Method of instruction is audio-lingual.

1225 Elementary Russian II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1225.

2115 Intermediate Russian I. Prerequisite: 1225 or equivalent. Continuation of 1225. Russian grammar, composition and conversation.


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 thought and the relevance of theory to sociological research.

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1225 Elementary Russian II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1225.

2115 Intermediate Russian I. Prerequisite: 1225 or equivalent. Continuation of 1225. Russian grammar, composition and conversation.
Sociology of Aging. (S) (SpD) Prerequisite: Sociology of Aging. Sociological problems of aging, including the analysis of the behavior of the aged within the framework of social institutions.

3993 Senior Thesis in Sociology. Prerequisites: 3113, 4013, 4133, STAT 4013, and consent of instructor. 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 sociology.

5000 Thesis in Sociology. 1-6 credits, maximum 6.

5113 Classical Sociological Theory. Prerequisite: 3113 or equivalent. Major trends in sociological thought. The emergence of sociological theory in Europe and America.

5123 Contemporary Sociological Theory. Prerequisite: 3113 or equivalent. Critical examination of significant theoretical formulations, 1920 to the present. Relation between theoretical development and current research emphasis.

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 qualitative and quantitative sociological research.

5253 Sociology of Small Groups. Prerequisite: 3223 or equivalent. Structural variation, ordering, communication, social bonding and task performance in small-group association.

5263 Methods of Social Research II. Prerequisite: 4133 and STAT 4853, or equivalents. Advanced techniques in sociological research and data analysis focusing on the formulation of substantive research questions and application of a variety of statistical techniques and computer programs to answer such questions.

5273 Qualitative Research Methods. Examination of ethnographic studies and implementation issues connected with qualitative research. Research project required.

5323 Social and Cultural Change. Classical and modern theories of social, cultural and societal change. Special emphasis on societal development in the modern world system and its impact on individuals and social relationships.

5353 Rural Social Systems. Prerequisite: graduate standing or consent of instructor. Rural social systems in contemporary societies examined historically, theoretically and empirically, focusing on social relations and institutions within rural societies and their relationship to urban social structures.

5533 Correctional Institutions and Residential Treatment. Prerequisite: 4923 or equivalent. Nature and effects of custodial institutions on the inmates. Prison community, its structure, social processes and dynamics. Resocialization of prison inmates in new vocational and social skills.

3952 Applied Sociology. Prerequisite: sociology majors or consent of instructor or adviser. Application of sociological theory and methods to various job situations.

3993 Senior Thesis in Sociology. Prerequisites: 3113, 4013, 4133, STAT 4013, and consent of instructor. Conduct a research project (review literature, prepare proposal, gather and analyze data and report results) on a sociologically significant topic or issue.

4013 Qualitative and Applied Social Research Methods. Prerequisites: 3113 and STAT 4013. Conducting, analyzing and reporting qualitative social research. Research design, data collection, analysis and write-up of evaluation research and social impact assessments. Individual research project included.

4023 (S) Juvenile Corrections and Treatment Strategies. Prerequisite: 3523 or 4333. The juvenile justice system, emphasizing the juvenile court, diversion and youth service bureaus as well as the more traditional training schools and foster homes. Experimental treatment strategies with institutionalized delinquents.

4133 (A) Social Research Methods. Prerequisites: 3113 and STAT 4013. Applying sociological theory to designing quantitative and qualitative research; methods of data collection, processing and analysis; basic skills in computer analysis of social data. Research project included.

4213 (S) Sociology of Human Sexuality. Prerequisite: junior standing or consent of instructor. Sociological and social psychological aspects of human sexual behavior, attitudes, and relationships. Theoretical concepts, empirical research, and descriptive rates of behavior are discussed.


4233 Sociology of Agriculture. Overview of U.S. agriculture focusing on changing markets and technologies and their impact on farm families and other social institutions and relationships. Emphasis on agricultural problems, policies and alternatives to traditional farming practices.


4343 (S, SpD) Medical Sociology. Health and illness as social and societal phenomena including the doctor-patient relationship, distribution and etiology of disease, the social meaning of health and illness, basic epidemiology, and the social processes involved in medical practice. Cross-cultural comparisons and the sociology of the health professions.

4383 (S) Social Stratification. Systems of class and caste, with special attention to the United States. Status, occupation, income and other elements in stratification.

4423 (S) Community Organization and Development. Structure, change and development of the local community in rapidly changing society. Emphasis on community organization and planned change.

4433 (S, SpD) Social Ecology and Life Processes. Human interdependencies and interrelationships with the social and physical environments, with special focus on the mutual impact of human values, human environment and life phase.

4443 (S) Sociology of Law and Legal Institutions. Prerequisite: 3523 or 4333. Criminal and civil law as mechanisms of social control; conflict and consensus models of legislation; legality doctrine and its application by police, prosecution and defense, courts and administrative agencies of control. Decision processes in the criminal justice system, personnel and case loads and related areas.

4513 (S) Demography of Minorities. Compares several minority groups along major demographic dimensions, i.e., a comparison across minority groups as well as within minority groups. Emphasizes social, political and economic factors as affected by population variables.

4533 (I, SpD) World Population Problems. Fertility, mortality and migration, and other factors related to population size, density, and composition; the population explosion, worldwide famine, birth control, and other serious social issues.

4623 (I) Sociology of Industry and Work. The inter-relationship of the social order and work plant as a social system, work role behavior and special groups in industry and work.

4643 (S) Women: A Cross-cultural Perspective. Compares the roles of women in different types of societies (hunting and gathering, horticultural, peasant and agricultural). Social, familial, economic and legal status of women in American society. Same course as ANTH 4843.

4773 Social Casework Methods. Prerequisite: 3883 or consent of instructor. Methods for social work intervention with individuals, groups and families. Concepts, techniques and assessment methods.

4850 Internship in Sociology. 1-4 credits, maximum 4. Prerequisites: 3952, completion of 12 hours of sociology, or consent of internship 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 social welfare policy through program management and macro-level social work skills.

4990 Exploration of Sociological Issues. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Examines sociologically significant topics and issues.
Spanish (SPAN)

1115 Elementary Spanish I, Lab 1 1/2. Pronunciation, conversation, grammar and reading.
1225 Elementary Spanish II, Lab 1 1/2. Prerequisite: 1115, or equivalent.
2112 Intermediate Reading and Conversation I, Lab 1. Prerequisite: 1225 or equivalent. (May have been gained in high school.) Reading and discussion of simple Spanish texts, mostly cultural. May be taken concurrently with other 2000-level Spanish courses.
2113 Intermediate Conversation and Composition I, Lab 1. Prerequisite: 1225 or equivalent. (May have been gained in high school.) Review and further presentation of grammar and pronunciation; consolidation of basic skills, with additional emphasis on writing. May be taken concurrently with other 2000-level Spanish courses.
2222 Intermediate Conversation and Composition II, Lab 1. Prerequisite: 2113 or equivalent. (May have been gained in high school.) Readings, vocabulary building, conversation, guided composition. May be taken concurrently with other 2000-level Spanish courses.
2223 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 concurrently with other 2000-level Spanish courses.
3003 (H)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.
3200 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 in writing. Spanish majors must take all three credits in one semester.
3210 Advanced Grammar, 1-3 credits, maximum 3. Prerequisites: 20 credit hours of Spanish or equivalent proficiency. Spanish majors must take all three credits in one semester.
3333 (H)Hispanic Civilization I. Prerequisite: 20 credit hours of Spanish or equivalent. Reading and discussion of selected texts outlining the development of contemporary Spanish civilization. Classes conducted in Spanish.
3463 Advanced Diction and Phonetics, Lab 1. Prerequisite: 20 credit hours of Spanish or consent of instructor. Required course for teacher certification. Spanish speech sounds and intonation patterns, with practice to improve the student's pronunciation.
4113 (H)Chicano Literature and Civilization. Prerequisites: 20 credit hours of Spanish or equivalent competence. Reading, analysis, and discussion of the most outstanding works in Chicano literature produced since 1848. Contemporary works are emphasized. Classes conducted in Spanish.
Chapter 1: Communication in Organizational Settings

1.1 The Nature of Communication in Organizations

1.2 Communication Processes and Systems

1.3 Communication Barriers and Solutions

1.4 Communication in Teams and Groups

1.5 Communication and Decision Making

Chapter 2: Nonverbal Communication

2.1 The Importance of Nonverbal Communication

2.2 Nonverbal Cues and Their Interpretation

2.3 Nonverbal Communication Across Cultures

Chapter 3: Communication Theory

3.1 Theories of Communication

3.2 Communication Models

3.3 Communication Process and Feedback

Chapter 4: Communication in Professional Settings

4.1 Communication in Healthcare Settings

4.2 Communication in Business Settings

4.3 Communication in Educational Settings

Chapter 5: Communication in Interpersonal Settings

5.1 Communication in Intimate Relationships

5.2 Communication in Family Settings

5.3 Communication in Group Settings

Chapter 6: Communication in Public Speaking

6.1 Public Speaking Theory and Practice

6.2 Public Speaking Techniques

6.3 Public Speaking for Specific Purposes

Chapter 7: Communication and Social Psychology

7.1 Communication and Social Influences

7.2 Communication and Social Change

7.3 Communication and Social Problems

Chapter 8: Communication and Technology

8.1 Communication Technologies

8.2 Communication in Digital Environments

8.3 Communication and Social Networking

Chapter 9: Communication and Law

9.1 Communication and Legal Issues

9.2 Communication and Legal Practice

9.3 Communication and Legal Education

Chapter 10: Communication and Healthcare

10.1 Communication in Healthcare Providers

10.2 Communication in Healthcare Administration

10.3 Communication in Healthcare Research

Chapter 11: Communication and Education

11.1 Communication in Education

11.2 Communication in Educational Research

11.3 Communication in Educational Practice

Chapter 12: Communication and Business

12.1 Communication in Business

12.2 Communication in Business Research

12.3 Communication in Business Practice

Chapter 13: Communication and Public Policy

13.1 Communication and Public Policy

13.2 Communication in Public Policy Research

13.3 Communication in Public Policy Practice

Chapter 14: Communication and the Law

14.1 Communication and Legal Issues

14.2 Communication in Legal Practice

14.3 Communication in Legal Education

Chapter 15: Communication and Ethics

15.1 Communication and Ethical Issues

15.2 Communication in Ethical Practice

15.3 Communication in Ethical Research

Chapter 16: Communication and Technology

16.1 Communication and Digital Technologies

16.2 Communication in Virtual Environments

16.3 Communication and Digital Ethics

Chapter 17: Communication and the Law

17.1 Communication and Legal Issues

17.2 Communication in Legal Practice

17.3 Communication in Legal Education

Chapter 18: Communication and Ethics

18.1 Communication and Ethical Issues

18.2 Communication in Ethical Practice

18.3 Communication in Ethical Research

Chapter 19: Communication and Technology

19.1 Communication and Digital Technologies

19.2 Communication in Virtual Environments

19.3 Communication and Digital Ethics
Communication Problems of Children with neurologically-based disorders. Prerequisites: 3013, 3224. Speech and language diagnostic testing and procedures, interpreting diagnostic information and deriving appropriate treatment goals.

4313 (N)Speech Science. Prerequisite: 4214. Scientific foundations of the acoustic parameters, the perceptual and productive processes of speech, and the interrelationships of those factors during speech communication. Laboratory experience required.

4323 Language Assessment and Intervention. Prerequisite: 3224. Nature and formal assessment of language; cognitive and social development; intervention techniques.


4443 Stuttering. Prerequisite: junior standing or consent of instructor. Recent research into the nature, causes and treatment of stuttering.

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 speech pathology.

5003 Research and Thesis. 1-3 credits, maximum 6. Prerequisite: approval of head of department. Research in speech and language pathology and audiology.

5013 Research Methods in Communication Disorders. Prerequisite: 3213. Research methods with emphasis on those used most frequently in speech and language pathology and audiology; experience devising and implementing research.

5113 Language Disorders of Children: Birth to Age Five. Prerequisite: 3224. Overview of preschool language disorders; history, symptoms, language assessment, theories and methods of language intervention, program evaluation, risks at school, research trends.

5123 Clinical Audiology. Prerequisites: 3123, 4133, 4313. Hearing disorders and their etiologies. Clinical application of pure tone and speech audiometric tests, including special diagnostic tests. Application to clinical management of the hearing impaired.


5173 Communication Problems of Children with Special Adaptive Needs. Prerequisites: 4113. 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 on or off campus.

5243 Language Disorders of School-Age Children and Adolescents. Prerequisite: 4323 or consent of instructor. Language, 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.

5262 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.

5333 Voice Disorders. Prerequisite: 4313. The physiology of the vocal mechanism and factors which cause voice deviations. Recent research on diagnostic and intervention procedures in a variety of disorders. Independent study, observations in medical settings, and special demonstrations.

5710 Special Topics in Communication Disorders. 1-4 credits, maximum 9. Prerequisite: approval of department head. Individual and group investigations of problems in speech and language pathology and audiology.

5720 Seminar in Communication Disorders. 1-3 credits, maximum 3. Prerequisite: consent of instructor. Topics relevant to the evaluation and treatment of communication disorders presented on a rotating basis.

5730 Professional Issues. 1-2 credits, maximum 2. Prerequisite: graduate standing in speech pathology. Discussion of professional standards, ethics, practice and issues in speech-language pathology.

5740 Multicultural Applications in Communication Disorders. 1-2 credits, maximum 2. Prerequisites: 3224, 4253, consent of instructor. The study of communication differences and disorders in ethnic and culturally diverse groups within the U.S. and clinical applications for assessment and intervention. Case study and program design.

Statistics (STAT)

2013 (A)Elementary Statistics. Prerequisite: MATH 1513. An introductory course in the theory and methods of statistics. Descriptive measures, elementary probability, samplings, 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.

3013 (A)Intermediate Statistical Analysis. Prerequisite: 2013 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,SpD)Statistical Methods I. Lab 2. Prerequisites: 60 credit hours including MATH 1513. Basic experimental statistics, basic probability distributions, methods of estimation, tests of significance, linear regression and correlation, analysis of variance for data that are in a one way, a two-way crossed, or in a two-fold nested classification.

4023 (A,SpD)Statistical 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.

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: 4033. Methods of experimental statistics for engineers. Analysis of variance, multiple comparison test, 2n factorial arrangement of treatments, fractional factorials, randomized block designs, simple and multiple linear regression. No credit for students with credit in 4013 or 5013.

4081 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 Probability Theory. Prerequisite: MATH 2155 and one other course in MATH which has either 2145 or 2155 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 2155. Introduction to probability theory for students who are not graduate 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 3013. Statistical inference for students who are not graduate majors in statistics or mathematics. Sampling distributions, maximum likelihood methods, point and interval estimation, hypothesis testing.

4223 Statistical Inference. Prerequisites: 4113 and MATH 3013. Sampling distributions, point estimation, maximum likelihood methods, Rao-Cramer inequalities, confidence intervals, hypothesis testing, sufficiency, completeness.

4910 Special Studies. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special subjects 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 graduate students. Descriptive statistics, basic probability, probability distributions, fundamentals of statistical inference, hypothesis testing, regression, one-way classification, analysis of variance, 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, completely randomized, randomized block and Latin square designs, multiple comparisons.

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, methods based on rank transforms, measures of association, goodness-of-fit tests, order statistics.

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. Questionnaire 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.

5073 Categorical Data Analysis. Prerequisites: 4223, 5023 or equivalent. Analysis of data involving variables of a categorical nature. Contingency tables, exact tests, binary response models, loglinear models, analyses involving ordinal variables, multinomial response models. Computer usage for analysis is discussed.

5113 Intermediate Probability Theory. Prerequisites: 4113 and MATH 4153. Measure theoretical presentation of probability, integration and expectation, product spaces and independence, conditioning. Different kinds of convergence in probability theory and statistical spaces. Same course as MATH 5113.

5133 Stochastic Processes. Prerequisites: 4113 and MATH 2233, MATH 3013. Definition of a stochastic process, probability structure, mean and covariance function, the set of sample functions, stationarity and their spectral analysis, renewal processes, counting processes, discrete and continuous Markov chains, birth and death processes, exponential model, queueing theory. Same course as INDEN 5133 and MATH 5133.

5203 Large Sample Inference. Prerequisites: 4223 and MATH 4153. Large sample estimators, decision theory, loss and risk, minimax risk decision, conjugate families of distributions, Bayesian decisions.

5303 Experimental Design. Prerequisite: 5023 or 4203 with consent of instructor or 4053 with consent of instructor. Review of basic concepts and principles of comparative experiments, the role of randomization in experimentation, interpretation of effects and interactions in multi-factor designs, error term selection principles, multiple comparisons, split-unit experiments, incomplete block designs, confounding of factorial effects in 2n and 3n series of factorials, single and fractional replication optimum seeking designs, pooling of experiments over time and space, crossover and switch back designs.

5323 Theory of Linear Models I. Prerequisites: 4223, 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.

5333 Theory of Linear Models II. Prerequisite: 5323. 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.

5403 Theory of Sample Design. 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.


5910 Seminar in Statistics. 1-6 credits, maximum 12. Special studies for master's students. Survey and discussion of research in mathematical statistics and statistical methods.

6000 Research and Thesis. 2-10 credits, maximum 24. Prerequisite: consent of advisory committee. Directed research culminating in the Ph.D. thesis.

6013 Genetic Statistics. Prerequisites: 4213 or 4223, and ANSI 6003; or consent of instructor. Linear models for quantitative traits, genetic relationship and linkage. Theory of selection and crossbreeding. Mathematical techniques in inbreeding, Path coefficient theory.

6123 Advanced Probability Theory. Prerequisites: 5113 or MATH 5113, and MATH 4283. 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. Point estimation, maximum likelihood, Cramer-Rao inequality, confidence intervals, Neyman-Pearson theory of testing hypothesis and power of test.

6323 Advanced Design of Experiments. Prerequisites: 5033 and 5323 or consent of instructor. Construction of various 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 factorials, confounding in mixed series of factorials, randomization tests, transformation of data, plot techniques and principles of split-plot techniques. Analysis of series of experiments and analysis of covariance.

6910 Special Problems. 1-6 credits, maximum 12. Investigation of special problems in the theory and application of statistics using current techniques. Special studies for Ph.D. level students.

Technical Education (TECED)

3103 Introduction to Technical Education. The role and function of technical education in the development of human resources. Historic and philosophic bases for technical education with emphasis on programs, purposes, and objectives and the variety of environments in which such programs exist.

5223 Curriculum Development in Technical Education. The interrelationship of mathematics, science, technical specialty and general education in technical curricula. Contemporary practices in constructing, revising and evaluating technical curricula.

5233 Occupational Analysis. Techniques for determining educational requirements of technical occupations. Analysis systems used by educational institutions, the military and the United States Department of Labor.

Technology Education (TE)

3002 Introduction to Industrial Technology Education. Industrial technology education in a modern educational system, including the historical and philosophic bases for such programs. Purposes, objectives, and functions of contemporary industrial arts and technology education programs in public schools. Participation in on-site observation experience in the public schools.

3012 Industrial Tools and Equipment. Lab 3. Proper identification, use and care of shop and laboratory tools and equipment. Laboratory experience in the purchase, maintenance and repair of tools and equipment commonly used in the industrial arts programs of local schools.

3022 Theory and Practice in Home Maintenance. Lab 2. Principles of home maintenance and practice in the use of tools, equipment and materials necessary to maintain properly functioning heating, cooling, plumbing and electrical systems.


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: 3023 or equivalent or consent of instructor. Comprehensive study of the activities involved in preparing to build, building, and completing residential, commercial, industrial, and civil structures.

3053 Teaching Technology in the Elementary School. Educational projects and activities for stimulating student interest in technology. Analysis of historical development, basic foundations, concepts, and systems of technology. Practical aspects of planning, designing, and integrating technology-based activities into elementary and special education curricula.

3103 Architectural Drawing. Lab 3. Prerequisites: GENT 1153 and MECDT 1223 or equivalent or consent of instructor. Architectural drafting skills and information based on current drafting standards and trends in the architectural industry. Preparation of a complete set of drawings in residential or light commercial drafting. Computer graphics as a drafting tool.

3223 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 impacts of electronic communication systems and the nature of the electronic communication industry.

3301* Metrics 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.

3312 Manufacturing Materials and Testing. Lab 3. Physical properties and testing of materials used in industry such as metals, woods, plastics, ceramics, cements, adhesives and fasteners; stresses the use of such materials in industrial arts and technology education programs.

3323 Manufacturing Processes. Lab 4. Prerequisite: 3033 or permission of instructor. Methods and procedures for processing 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 systems of technology education. Fundamental aspects of instructional 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, manufacture and market finished products. Additional 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, and transmitting energy; and the utilization of energy conversion systems. Practical experience in overhaul and tune-up of small two-and four-cycle engines.

3672 Fundamentals of Power Transmission. Lab 2. Basic mechanics of power transmissions including mechanical, hydraulic and pneumatic systems. Selection and use 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. Prerequisites: 3033 and 3553. The methodology and practices of technical research and development as conducted in an industrial and educational setting. Laboratory activities performing basic tasks associated with product and process research and development.


4322* Industrial Technology. Industrial materials and manufacturing and processing techniques including 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. Principles, practices and problems in construction of industrial arts and technology education curricula.

4440* Industrial Crafts. 1-2 credits, maximum 6. Development of knowledge and skills in working with materials, tools and equipment used in various industrial crafts. Special emphasis placed on specific crafts that are most applicable to the elementary and special education curriculum.

5020 Seminar in Industrial Technology Education. 1-3 credits, maximum 3. Oral and written discussion of selected current interest topics concerning industrial arts and technology education. Forum for review of research proposals, student programs, other projects and timely topics having an impact on the industrial arts and technology education profession.

5133 Teaching Technology Education. Prerequisite: 3423 or equivalent, or consent of instructor. Advanced techniques and activities associated with teaching technology education systems. Specific emphasis on scientific inquiry, decision making, problem-solving concepts and activities in the public school technology education programs.

5233 Special Problems in Machine Woodworking. Materials, processes, design and cost accounting in the unit woodworking shop. Selection and use of appropriate machine equipment.

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 of 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. Problems concerning the organization and management of classes and personnel organizations, as well as special teaching methods and class control.


5663 Special Problems in Industrial Drawing. Special problems, techniques and methods applied in 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.

Telecommunications Management (TCOM)

5012 Telecommunications Laboratory. Lab 2. Prerequisite: graduate standing and consent of program director. Familiarization with the hardware used to move voice, data and video traffic. Data network experiments include set up and operation of small PBXs, interconnection of LANs and networking of two campus phone systems, and interconnection of the lab PBXs with a crosspoint switches and fiber. Video experiments include interconnection and operation of a small two-camera studio, and digitizing and transferring the video over the laboratory telephone system. Practical operating aspects and standards of distance transmission devices, switching equipment media for transmitting data, voice and video signals. Handling information problems within selected environments.
5113 Telecommunications Industry Overview. Prerequisites: graduate standing and consent of program director. The development of telecommunications technology, industry and policy in the United States, interrelationships among industry, government bodies and policies, and users. A broad view of telecommunications (terrestrial, satellite, and optical transmission systems) and the direction of the industry. A review of the players in the industry (common carriers, vendors, users and regulatory agencies), trends and directions, and implications for management. All forms of transmission media, including private and public networks. Trends resulting from the deregulation of the industry and the divestiture of AT&T.

5123 Managing with Information and Telecommunication Technologies. Prerequisites: graduate standing and consent of program director. Applications of telecommunications and information technologies to competitive management in a global economy. Strategic as well as operational applications of technologies. Case studies of several national and international companies. Opportunities and challenges presented by multinational telecommunications.

5143 Telecommunications Analysis, Planning and Design. Prerequisites: ECEN 5553 and consent of program director. Introduction to the basic system analysis tools and the procedures for conducting a system analysis. System requirements, the initial analysis, the general feasibility study, structured analysis, detailed analysis, logical design, and the general system proposal. Current system documentation through use of classical and structured tools and techniques for describing flows, data flows, data structures, files designs, input and output designs, and program specifications.

5153 International Telecommunications Management. Prerequisites: graduate standing and consent of program director. Investigation of the institutions that affect the use of telecommunications. The various parts of the federal government involved, such as the Department of Commerce, the FCC and the Department of State. The role of international institutions, including the ITU, UNESCO, and the various satellite organizations such as INTELSAT.

5163 Telecommunications Practicum. Lab 3. Prerequisites: graduate standing and consent of program director. Application of knowledge and skills developed in core courses in an organizational environment to solve telecommunications management problems. Integration of concepts and adaptation of theory to fit organizational reality.

5213 Network Design and Management. Prerequisites: ECEN 5553 and consent of program director. Technical as well as managerial aspects of developing an integrated communications network. Systems analysis and design of the communications networks covering voice, data and video. Management of a network.

Theater (TH)

1500 Theater Practicum. Lab 2. 1 credit, maximum 6. Laboratory experience in theater production, acting and crew assignments. Graded on a pass/fail basis.

1533 Voice and Diction. Freeing the natural voice; development of proper breathing techniques, resonance, and range; use of International Phonetic Alphabet in developing articulation and pronunciation; exercises in phrasing and intonation; preliminary dialect work.

2413 (H) Introduction to the Theater. Character, plot, dramatic, historical and production analyses of various types of play scripts; understanding the work of various theater artists; developing appreciative audiences.

2533 Oral Interpretation. Reading aloud effectively; training in voice improvement, platform techniques, selection criteria and audience analysis.

2543 Acting I. Prerequisite: 2413 or consent of instructor. Ensemble techniques and creative improvisation; vocal and physical development for the actor; theories and techniques of acting; fundamental scene and character analysis; scene performance workshops.

2663 Technical Production I. Lab 4. Elementary techniques of stagecraft and costume for the stage. Basic stagecraft skills. Practical experience preparing departmental productions.

3023 (H) Theater History I. Aesthetic and social relations of theater and western civilization from primitive times to the mid-17th century.

3123 (H) Theater History II. Aesthetic and social relations of theater and western civilization from the mid-17th century through the 19th century.

3143 (H) Theater History III. Aesthetic and social relations of theater and western civilization from 1900 to the present.

3400 Upper-division Projects. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Individual or group study of techniques, history, or literature of the theater. Required written survey of the project and self-evaluation of its results, or a term paper.

3733 Stage Movement for Actors. Techniques and exercises to build the actor’s awareness and abilities for use of the bodily instrument on stage; preparation and readiness routines; rhythms, positions, and movement patterns appropriate to various styles of theater and to specific character roles.

3743 Acting II. Prerequisite: 2543. Continuation and refinement of 2543. Textual and character analysis, characterization and inner techniques. Audition techniques and realistic comedy through scene work with contemporary plays.

3963 Technical Production II. Lab 4. Elementary techniques of costume craft and stagecraft for the stage. Basic costuming skills. Practical experience preparing departmental productions.


4123 (H) Stage Costume History I. Comprehensive history of theatrical costume from ancient Egypt to 1700. Impact of fashion on the stage.

4143 Acting III. Prerequisite: 3743. Continuation and refinement of 3743. Performance techniques in classic to modern styles. Shakespeare to Miller.

4163 Scene Design for Theater and Television. Prerequisites: 2413, 2663 or 3963 and 4063. The designer's approach to the script; execution of sketches, models and working drawings.

4323 (H) Stage Costume History II. Comprehensive history of theatrical costume from 1700 to the present. Impact of fashion on the stage.

4403 Senior Honors Project. Prerequisites: departmental invitation, senior standing. Honors program participation. A guided reading and research program ending with an honors thesis or performance under the direction of a faculty member, with second faculty committee member. Required for graduation with departmental honors in theater.

4593 Lighting for Theater and Television. Lab 2. Stage lighting design, elementary electricity, design of lighting instruments. Practical experience in lighting in preparing and running departmental productions.

4953 Directing. Prerequisite: 2543. Play analysis for production, problems in staging, and the role of the director. Planning and direction of scenes in laboratory situations.

4963 Theater Graphic Techniques. Fundamental theater graphic techniques to communicate theatrical design ideas.

4973 Stage Costume Design. Lab 4. Prerequisites: 2413, 4963. Approaches to basic costume design including research, conceptual analysis, figure drawing, and executions of sketches and renderings.

4983 Scene Painting. Lab 3. Prerequisite: 2613. Elementary techniques of scene painting. Individual projects in large scale in representing marble, rock to landscape, interiors. Color theory, forced perspective, ability to paint different styles. Practical experience preparing for departmental productions.

5013 Theater Research Methods. Diverse methods of theater research appropriate to performance, design and technology, and history and theory. Developing familiarity with standard references and journals of the field, and introduction to professional organizations.

5243 Problems in Advanced Acting. Prerequisites: 4143 and graduate standing or consent of instructor. Experimentation in psychological realism. Concentration on analysis, technical skills, and contacting the emotions. Special preparations for professional interviews and auditions.

5400 Seminar in Theater. 1-3 credits, maximum 12. Prerequisite: consent of instructor. Individual or group studies of techniques, history or literature of the theater. A term paper or written report and self-evaluation of the study or project required.

Trade and Industrial Education (TIED)

2000 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. Graded on a pass-fail basis.

3000 Trade and Industrial Occupational Experience. 1-24 credits, maximum 24. Prerequisites: two years teaching experience, satisfactory completion of the required basic 16 credit hours of TIED courses and consent of instructor. Credit to be determined by a special skill competency examination.

3203 Foundations and Services of Trade and Industrial Education. Opportunities provided by vocational education, with special emphasis on trade and industrial education and its relationship to other elements of the educational system. Legislative aspects of vocational education, general education, student guidance, and programs for disadvantaged and handicapped students.

4103 Instructional Procedures in Trade and Industrial Education. Prerequisites: 4344 and full admission to Teacher Education. Methods and techniques for effective teaching and learning in classroom and shop instruction. Emphasis on the use of instructional aids and competency development. No credit for students with credit in OAED 4103.

4110 Trade Technical Information. 1-4 credits, maximum 6. Prerequisite: consent of instructor. New developments in scientific and technical information and knowledge that are relevant to current trade practices.

4123 Coordinating Vocational Student Organizations and Activities. Student organizations and activities in vocational education at local, state and national levels. Procedures for planning programs of work, incorporation of student organization activities into curriculum, adviser characteristics and responsibilities, fund-raising activities, and techniques for recognizing outstanding members and community supporters.

4214* Safety, Organization and Management of Learning Facilities. 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.

4344 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.

4773 Practices and Problems of School-to-Work Transition Programs. Problems of school-to-work transition and examination of practices designed to improve it. Planning, organizing, and developing strategies to implement and evaluate school related work-based learning.

4883 Practices and Problems in Integrating Academic and Vocational Education. Prerequisite: 4103 or consent of instructor. Experiences in learning, designing, and practicing strategies that technical and industrial teachers can use to integrate academic competencies into their particular curricula. Design and presentation of cognitive, psycho-motor and affective occupational lessons that integrate math, social studies, science and/or English-related competencies.

5113* School-to-Work Transition. Strategies and procedures for coordinating school-to-work transition programs (e.g., cooperative education, youth apprenticeship, career exploration). Planning, organizing, implementing, and evaluating school-related, work-based learning.

5153 Supervision of Vocational Education. Prerequisite: consent of instructor. Role and function of administrators responsible for supervising the planning, implementation and management of vocational education programs.

5223* Evaluation of Instruction. Prerequisite: 4103. Principles of evaluation and methods for applying these principles to improve the effectiveness of vocational education programs.

5223* Teaching Related Information. Selection of job-related topics common to most trades with procedures for incorporating those topics into the regular curriculum.

5223* Advanced Instructional Procedures in Trade and Industrial Education. Advanced methods and procedures for effective teaching and learning in the trade and industrial classroom and laboratory. Teaching basic educational and employment skills and the selection of job-related topics common to most occupations with procedures for incorporating those topics into the regular curriculum.

5313* Guidance, Placement and Follow-up in Vocational Education. Prerequisite: vocational teaching experience. Teacher-counselor cooperation in vocational student advisement, placement and follow-up.

443* Individualizing Competency-based Instruction Programs. Develops knowledge and skills utilizing the concept of open entry/open exit necessary for planning, developing and implementing a competency-based vocational education program.

5553 Vocational Education, Community and Industry Relations. Exploration of strategies for developing meaningful relationship among vocational education programs. Special emphasis on experienced teachers to incorporate the latest industrial technology into their course of study.

University (UNIV)

0111 Developmental Science Process Skills. Instruction on what scientists do as they study and investigate the natural world. Emphasis on critical thinking processes. Observation, classification, metric measurement, data table construction, graph construction and interpretation. May be used to fulfill the science remediation requirement as established by State Regents policy. Graded on a satisfactory-unsatisfactory basis.

1011 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.

1111 University Academic Services Freshman Orientation. Prerequisite: beginning freshman standing in University Academic Services. Designed to help students ease the transition from high school to college; 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.

2001 Academic Assessment and Evaluation. Prerequisite: acceptance into the University Academic Assessment Program or consent of instructor. Required for students in University Academic Assessment Program. Designed to help students identify reasons for experiencing academic difficulty; assess individual learning styles and 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.

2510 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. Graded on a pass-fail basis.

3110 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, field work or internship.

5940 Career Orientation and Guidance. 1-3 credits, maximum 6. Developing models for career orientation; implementing programs of guidance for occupational choice; Employment opportunities and career development.
Veterinary Medicine (VMED)

5111 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 a pass-fail basis.

5221 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 a pass-fail basis.

5610 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 a pass-fail basis.

6611 Veterinary Medical Specialty Conference. Prerequisite: third-year standing in the College of Veterinary Medicine. Specialty conferences for third-year veterinary medical students presented by visiting professionals. A limited number of field trips will be conducted in which special presentations will be made.

6620 Clinical Science Elective. 1-8 credits, maximum 8. Prerequisite: third-year standing in the College of Veterinary Medicine. Problems in the clinical sciences. Graded on a pass-fail basis.

6721 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 a pass-fail basis.

6721 Veterinary Medical Clinic Conference II. Prerequisite: 6721. Presentation and discussion of selected clinical cases by fourth-year students and interdepartmental faculty groups. Graded on a pass-fail basis.

Veterinary Medicine and Surgery (VMS)

5412 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 lecturers in specialty areas assist in this course.

5422 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.

5441 Clinical and Surgical Techniques I. Prerequisite: second-year standing in the College of Veterinary Medicine. Behavior 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.

6002 Elective I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

6012 Elective II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

6022 Elective III. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

6032 Elective IV. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

6042 Elective V. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

6052 Elective VI. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

6501 Avian Medicine and Surgery. Prerequisite: third-year standing in the College of Veterinary Medicine. Clinical aspects of diseases of pets, zoo, exotic, and wild birds.

6516 Systemic Medicine and Diseases of Domestic Animals I. Prerequisite: third-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of diseases of food and fiber animals.

6523 Veterinary Surgery I. Prerequisites: 5422 and third-year standing in the College of Veterinary Medicine. Lectures and discussions in operative techniques and practices in veterinary surgery.

6533 Diagnostic Imaging. Prerequisite: third-year standing in the College of Veterinary Medicine. Diagnostic imaging with emphasis on radiographic interpretation; also alternate imaging. Presented in a problem-based format.

6542 Clinical and Surgical Techniques II. Prerequisites: 5441 and third-year standing in the College of Veterinary Medicine. Continuation of 5441. 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. Diagnosis, prognosis, treatment and prevention of diseases of horses.

6615 Systemic Medicine and Diseases of Domestic Animals III. Prerequisite: third-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of diseases of companion animals.

6642 Veterinary Surgery III. Prerequisites: 6523 and third-year standing in the College of Veterinary Medicine. Lectures and discussions in anatomical topics, operative techniques and practice in veterinary surgery.

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. Diagnosis, prognosis, prevention and treatment of diseases of animals presented in the preceptorship program. 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. Approved clinical rotations off the OSU campus. Graded on a pass-fail basis.

6712* Introductory Care Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Receiving and managing of emergency and critical care cases in companion animals. Graded on a pass-fail basis.

6714* Radiology Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnostic radiography, ultrasound, 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, clinical pathology and parasitology; diagnostic laboratory, and special aspects of the basic sciences.

6722 Equine Medicine. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of equine medical diseases.

6724 Anesthesiology Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Management of clinical anesthesia in various domestic species.

6730 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 Emergency General Medicine and Surgery Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Receiving and managing emergency and general medical and surgical cases in companion animals.

6740 Special Clinic III. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of 6730. Graded on a pass-fail basis.

6742 Small Animal Medicine Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, 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, treatment and prevention of companion animal medical and surgical diseases.

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.
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.

Intensive Care Clinic II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Receiving and managing of emergency and critical care cases in companion animals. Continuation of 6712. Graded on a pass-fail basis.

Equine Surgery. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of equine surgical diseases.

Emergency General Medicine and Surgery Clinic II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Receiving and managing emergency and general medical and surgical cases in companion animals. Continuation of 6732.

Small Animal Medicine Clinic II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of companion animal medical diseases. Continuation of 6742.

Small Animal Surgery Clinic II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of companion animal surgical diseases. Continuation of 6752.

Food Animal Medicine Clinic II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of food animal medical and surgical diseases. Continuation of 6762.

Clinic Pool II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Semi-elective clinical assignment.

Clinical Problems and Investigation. 1-6 credits. maximum 6. Prerequisite: third-year standing in the College of Veterinary Medicine. Diseases of animals.

Advanced Clinics. 1-6 credits, maximum 6. Prerequisite: third-year standing in the College of Veterinary Medicine. Diseases of animals.

Seminar. 1-3 credits, maximum 3. Prerequisite: graduate standing in the College of Veterinary Medicine or biological sciences. Literature and research problems pertaining to veterinary medicine and surgery.

Comparative Anesthesiology. 1-3 credits, maximum 3. Prerequisite: graduate standing in the College of Veterinary Medicine or consent of the head of the department. Anesthesiology of animals.

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.

Clinic Pool III. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Semi-elective clinical assignment. Graded on a pass-fail basis.

Animal Hygiene. Prerequisite: junior standing in the College of Agriculture. Principles of sanitation and of prevention and control of common diseases of livestock.

Thesis. 1-6 credits, maximum 6. Prerequisite: standing from the field of veterinary medicine or consent of instructor. 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.

Special Problems. 1-6 credits, maximum 6. Prerequisite: graduate standing or consent of department head. Special research problems in veterinary microbiology and parasitology.

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.

Current Topics in Veterinary and Biomedical Science. 1 credit, maximum 4. Prerequisite: a minimum of one undergraduate introductory course in microbiology. Development of oral presentation skills, critical thinking and deductive reasoning through the use of discussion of current literature from the field of veterinary and biomedical science as it pertains to the study of infectious disease in humans and animals.

Diseases and Parasites of Wild Animals. Lab 1. Prerequisite: consent of instructor. A systematic approach to bacterial, viral and parasitic diseases of wild animals. Principles of disease transmission as it relates to individuals and populations of wild animals. Principles applicable to all areas of zoology, veterinary medicine and wildlife management. Same course as ZOOL 5593.

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.

Veterinary Biometry and Principles of Public Health. Prerequisite: first-year standing in the College of Veterinary Medicine. Statistics applied to biological observations applicable to veterinary medicine and principles of public health and epidemiology.

Veterinary Virology. Lab 3. Prerequisite: second-year standing in the College of Veterinary Medicine or consent of instructor. Viruses responsible for disease in domesticated animals.

Food Hygiene. Prerequisite: second-year standing in the College of Veterinary Medicine. Public health principles and standards applying to the maintenance of a wholesome food supply. Regulations and procedures for inspection of animals slaughtered for food and of food products of animal origin. Human nutrition, environmental and consumer aspects of food quality.

Veterinary Parasitology. Lab 3. 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.

Techniques in Parasitology. Prerequisites: graduate standing and general parasitology, helminthology or concurrent enrollment. Experimental application of basic research and teaching techniques in helminthology and protozoology. Individual participation and analysis of experimental situations and techniques applicable to all areas of zoology.

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.

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.

Veterinary Virology. Prerequisites: 5313, MICRO 4114 and consent of instructor. Discussion of theoretical and practical problems relating to the molecular biology of virus replication including virus structure and replication strategies, virus-host cell interactions, and anti-viral mechanisms.

Biology of Parasites. Prerequisites: 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.

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.

Veterinary Diagnostic Microbiology. Lab 6. Prerequisite: graduate veterinarian status or consent of instructor. Laboratory methods employed in the isolation of microorganisms and application of the isolation of microorganisms and application of techniques in the diagnosis of specific animal diseases.

Research Thesis. 1-11 credits, maximum 45. Prerequisite: candidacy for the Ph.D. degree. Research problems for graduate student to meet thesis requirement of the Ph.D. degree.

Seminar. 1-6 credits, maximum 6. Prerequisite: graduate standing. Subjects for study and discussion for graduate students.

Advanced Concepts in Veterinary Immunology. Prerequisite: 5113 or BIOCH 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.

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.
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 and laboratories covering cellular and tissue pathology, pigments, inflammation, immunopathology, disturbances of growth and circulation. Introduction of pathology of the various systems. The functional disturbances that accompany changes in structures, as well as the cause, pathogenesis, and clinical correlations of diseases. Correlation of altered structure and function with clinical signs.

5413 Clinical Pathology. Prerequisite: second-year standing in the College of Veterinary Medicine or graduate standing with consent of department head. Data interpretation and laboratory methods used in evaluation of pathologic 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. Lectures and laboratories covering the pathology of those systems not covered in preceeding course.

5500 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: 5255. Pathology of infectious diseases of food and companion animals and methods employed in diagnosis.

6550 Advanced Pathology Techniques and Special Problems. 1-6 credits, maximum 20. Prerequisites: graduate standing in biological sciences with written consent of department head. Seminars on contemporary techniques and methods used in diagnosis, technical work and research in pathology.

6612 Poultry and Laboratory Animal Diseases. Prerequisite: 5425 or written consent of department head. Biological characteristics, husbandry, diagnosis, prevention, and treatment of diseases of domestic poultry and selected species of animals used in teaching and biomedical research.

6732 Diagnostic Pathology and Parasitology I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Participation in animal necropsy, clinical pathology and clinical parasitology laboratories to study diagnosis, prognosis, prevention and treatment of diseases. Graded on a pass-fail basis.

6811 Differential Diagnosis. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Exercises in the differential diagnosis of diseases of domestic animals.

6832 Diagnostic Pathology and Parasitology II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Participation in animal necropsy, clinical pathology and clinical parasitology laboratories to study diagnosis, prognosis, prevention and treatment of diseases. Graded on a pass-fail basis.

6910 Seminar. 1-2 credits, maximum 6. Prerequisite: second degree or graduate standing in biological sciences. For students with medical degrees: interpretation of histologic materials. For students with graduate standing in biological sciences: review of literature and discussion of research problems.

6920 Diagnostic Pathology. 1-4 credits, maximum 20. Prerequisite: graduate standing in the College of Veterinary Medicine or written consent of department head. Weekly review of current cases submitted to the department and the methods employed in diagnosis. Examination of necropsy reports, specimens, and preparations. Students required to formulate diagnoses.

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.

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 or four different groups of organs and systems of the animal body. A consideration of the pathogenesis and the morphological, biochemical, and comparative aspects of lesions found in organs and tissues of the domesticated animals.

6963 Advanced Clinical Pathology. Prerequisites: 5425 or equivalent, graduate standing, and written consent of department head and instructor. Advanced clinical biochemistry, organ function tests and related cytologic examination.

6973 Advanced Hematology. Prerequisites: 5425 or equivalent, graduate standing, written consent of department head and instructor. The etiology and pathogenesis of the diseases of the blood and bone marrow.

Zoology (ZOOL)

4164 Ornithology. Lab 4. Prerequisite: BIOL 1603. Classification, evolution, distribution, identification, life histories, and morphological, ecological and behavioral adaptations of birds. One weekend field trip required.

4174 Mammalogy. Lab 3. Prerequisite: 3115 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 BIOL 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.

4222 Mammalian Physiology Laboratory. Lab 6. Prerequisite: 4215. Laboratory experiments that illustrate function of organs, organ systems or mechanisms of whole body physiological control. 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 drug classes based on their predominant use or principal activity in the body: basis for drug 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: BIOL 3014 or BIOCH 3653. Cellular activities and fundamental physiological processes.

4404 Ichthyology. Lab 6. Prerequisite: 3115 or consent of instructor. Systematics, evolution, distribution and morphological, ecological and behavioral adaptations of fishes. Emphasis on Oklahoma forms. Two weekend field trips required.

4414* Fisheries Management. Lab 4. Prerequisite: BIOL 3034. Techniques and principles involved in management of fishes. Field trip fee required.

4434 Limnology. Lab 3. Prerequisite: BIOL 3034. Physical, chemical and biological factors in lakes and streams.

4513 Wildlife Management. Prerequisite: 3513. Biological basis for the management of wildlife populations and habitats, with emphasis on current management problems.

4523 Wildlife Management Techniques. Prerequisite: 4513, ENG 3323 strongly recommended. The semistructured 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, behavior, exhibit planning and architecture, zoo administration and research potential. Students undertake a research project in exhibit design. Lecturers include professional staff members of the Oklahoma City Zoo and guest speakers.

4700 Undergraduate Research Problems. 1-4 credits maximum 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. Prerequisite: 90 credit hours, GPA of 3.30 in 16 or more hours in zoological courses, consent 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 Master's Thesis. 1-6 credits, maximum 6. Prerequisite: approval of major adviser. Independent research for the M.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. Prerequisites: graduate 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 seminars on problems involved in teaching zoology in college.

5103 Developmental Biology. Prerequisite: BIOL 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. 1-5 credits, maximum 20. Prerequisite: consent of instructor. Investigations in physiology for graduate and advanced undergraduate students. Same course as PHSI 5110.

5123 Behavioral Ecology. Prerequisite: BIOL 3034 or equivalent. Analysis and description of the behavior of 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: BIOL 3034. Ecological concepts dealing with contemporary evolutionary processes, not phylogeny. Life history traits, R and K selection, sociability, kin and group selection, specialization, 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: BIOL 3034; BIOL 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.

5223 Membrane Biophysics and Bioenergetics. Prerequisites: PHYS 1214, and BIOL 3014 or BIOCH 4113 or CHEM 3354 or PHYS 3313. Application of biophysical, biochemical and biological techniques to the study of the structure and function of membranes and membrane components; kinetic measurements, spectroscopic techniques and diffractive techniques. Application of these illustrated with current research problems. Same course as PHYS 5353.

5314* Wildlife Toxicology. Lab 6. Prerequisites: BIOL 3653, BIOL 3024, 3034. Examination of methods used for evaluation of toxic responses of wildlife to pollutants; demographic surveys, biomarkers, toxicity tests. Emphasis on terrestrial ecosystems.

5323 Principles of Toxicology. Prerequisites: BIOL 3653, BIOL 3014 or consent of instructor. Basic toxicological principles, mechanism of toxicity, and toxicological testing procedures. Toxic effects of environmental exposure to xenobiotics.

5413 Principles of Ecotoxicology. Prerequisites: BIOL 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, infra-red and ultraviolet spectrometry.

5433 Advanced Fishery Science. Lab 4. Prerequisite: consent of instructor. Application of ecological and evolutionary theory to problem solving in fishery research and management.

5463 Stream Ecology. Lab 1. Prerequisite: BIOL 3034 or equivalent. Ecology of streams and rivers with emphasis on physical and chemical processes, adaptations of aquatic biota to riverine environments, and human impacts on riverine ecosystems.

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 BIOL 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: BIOL 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.