An Oklahoma State University education is about providing choices and value. It's about people gathering together to investigate and discover, uncover opportunities and take on challenges. With more than 300 undergraduate and graduate degree programs and options, OSU is a premier land-grant institution with a world-wide reach. Our faculty includes leaders in their fields and an array of nationally published authors and scientists. Oklahoma State University provides world-class education to all students-- full-time, part-time, adult and non-traditional.

Our investment in teaching and research creates an educational experience that is intellectually challenging and has practical value far beyond the classroom. OSU students learn hands-on while working with world-class experts, scientists, artists and intellectuals on cutting-edge research that is changing the way we live.

OSU has been recognized for its educational value by *U.S. News & World Report, Forbes, Princeton Review*, and *Kiplinger*. The *Wall Street Journal* listed OSU among the nation's top schools for best preparing graduates for success, as determined by corporate recruiters.

OSU also is home to nearly 1,400 valedictorians, and a long list of Rhodes, Truman, Marshall, Udall, Goldwater, Gates, Phi Kappa Phi and other national scholars. OSU allows students to stretch their learning with its nationally recognized Honors College, offers unique opportunities for undergraduate research and provides advising and academic support services through its University College.

With more choices, top faculty and cutting-edge resources all at a great value, Oklahoma State University is the place for a world-class education.

Oklahoma State University is accredited by the Higher Learning Commission (HLC) A Commission of the North Central Association of Colleges and Schools and programs within the colleges are also accredited.

Higher Learning Commission (HLC)
30 N. LaSalle Street, Suite 2400
Chicago, IL 60602
800.621.7440
www.ncahigherlearningcommission.org
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 the entire 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 registrar@okstate.edu. Publications concerning a number of topics are also available upon request.

OSU information is available via the Internet:
  Main Page: go.okstate.edu
  Admissions: admissions.okstate.edu
  Catalog and undergraduate degree programs: registrar.okstate.edu

The OSU Catalog may be obtained by new students during their new student orientation session prior to their first semester at OSU. Other persons may purchase the Catalog through the Student Union Bookstore by mail. The current catalog is made available at the website address above prior to the beginning of the fall term.

To purchase a copy of the OSU Catalog contact the Student Union Bookstore at 1.800.831.4678. The domestic rate for the Catalog is $5.75 plus postage. The international rate is USD ($5.75 for the Catalog plus actual postage costs).

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, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-9154; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies. Any person (student, faculty or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU’s Title IX Coordinator, (405) 744-9154.

Cover artwork courtesy of University Marketing.

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# University Academic Calendar

Add, drop, withdrawal and refund dates listed below are for courses that extend through the entire term. Proportionate dates apply to block and short courses. See the 'Course/Schedule Information' page of the Registrar website at registrar.okstate.edu for more information.

<table>
<thead>
<tr>
<th>2016-2017 and 2017-2018**</th>
<th>FALL 2016</th>
<th>SPRING 2017</th>
<th>SUMMER 2017 (8 wk session #2)</th>
<th>FALL 2017</th>
<th>SPRING 2018</th>
<th>SUMMER 2018 (8 wk session #2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late enrollment fee assessed after this date</td>
<td>Aug. 12</td>
<td>Jan. 13</td>
<td>June 9</td>
<td>Aug. 18</td>
<td>Jan. 12</td>
<td>June 8</td>
</tr>
<tr>
<td>University Holiday (spring)</td>
<td>Jan. 16</td>
<td>Jan. 15</td>
<td></td>
<td>Jan. 16</td>
<td>Jan. 16</td>
<td>June 11</td>
</tr>
<tr>
<td>Class work begins</td>
<td>Aug. 15</td>
<td>Jan. 17</td>
<td>June 12</td>
<td>Aug. 21</td>
<td>Jan. 16</td>
<td>June 11</td>
</tr>
<tr>
<td>100% Refund, Nonrestrictive Drop/Add Deadline*</td>
<td>Aug. 22</td>
<td>Jan. 24</td>
<td>June 14</td>
<td>Aug. 28</td>
<td>Jan. 23</td>
<td>June 13</td>
</tr>
<tr>
<td>Partial Refund, Restrictive Drop/Add Deadline*</td>
<td>Aug. 26</td>
<td>Jan. 27</td>
<td>June 16</td>
<td>Sept. 1</td>
<td>Jan. 26</td>
<td>June 15</td>
</tr>
<tr>
<td>University Holiday (fall)</td>
<td>Sept. 5</td>
<td>Sept. 4</td>
<td></td>
<td>Oct. 3</td>
<td>Feb. 27</td>
<td></td>
</tr>
<tr>
<td>Six week grades due from faculty</td>
<td>Sept. 27</td>
<td>Feb. 28</td>
<td></td>
<td>Mar. 13-17</td>
<td>Mar. 19-23</td>
<td>Mar. 19-23</td>
</tr>
<tr>
<td>Students’ Fall Break</td>
<td>Oct. 14</td>
<td>to be determined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ Spring Break</td>
<td>Mar. 13-17</td>
<td>Mar. 19-23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deadline to file diploma application (for name to appear in fall commencement program)</td>
<td>Nov. 1</td>
<td>Nov. 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Holiday (summer)</td>
<td>July 4</td>
<td>July 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W Drop/Withdraw Deadline*</td>
<td>Nov. 4</td>
<td>April 14</td>
<td>July 21</td>
<td>Nov. 10</td>
<td>April 13</td>
<td>July 20</td>
</tr>
<tr>
<td>W/F Withdraw Deadline*</td>
<td>Nov. 18</td>
<td>April 28</td>
<td>July 28</td>
<td>Dec. 1</td>
<td>April 27</td>
<td>July 27</td>
</tr>
<tr>
<td>Students’ Thanksgiving break</td>
<td>Nov. 23-25</td>
<td>Nov. 22-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Holiday (fall)</td>
<td>Nov. 24-25</td>
<td>Nov. 23-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Finals Week</td>
<td>Nov. 28-Dec. 2</td>
<td>May 1-5</td>
<td>Dec. 4-8</td>
<td>Apr. 30-May 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class work ends</td>
<td>Dec. 2</td>
<td>May 5</td>
<td>Aug. 4</td>
<td>Dec. 8</td>
<td>May 4</td>
<td>Aug. 3</td>
</tr>
<tr>
<td>Final examinations</td>
<td>Dec. 5-9</td>
<td>May 8-12</td>
<td>Dec. 11-15</td>
<td>May 7-11</td>
<td>May 11-12</td>
<td></td>
</tr>
<tr>
<td>Commencement weekend</td>
<td>Dec. 9-10</td>
<td>May 12-13</td>
<td>Dec. 15-16</td>
<td>May 11-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grades due electronically from faculty</td>
<td>Dec. 13</td>
<td>May 16</td>
<td>Aug. 8</td>
<td>Dec. 19</td>
<td>May 15</td>
<td>Aug. 7</td>
</tr>
<tr>
<td>University Holiday (fall)</td>
<td>Dec. 23-Jan. 2</td>
<td>Dec. 22-Jan. 1</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Intersessions and Pre-Sessions**

| Fall Pre-Session | Aug. 1-12 | Aug. 7-18 |
| Summer Pre-Session (summer session #1) | May 22-June 9 | May 21-June 8 |

**Summer 4-Week Sessions**

| 4-week session (summer session #3) | June 12-July 7 | June 11-July 6 |
| 4-week session (summer session #4) | July 10-Aug 4 | July 9-Aug. 3 |

**DROP/ADD AND WITHDRAW DEADLINE DETAILS:**

100% Refund, Nonrestrictive Drop/Add Deadline:
- add a course (nonrestrictive)
- drop a course with 100% refund and no grade

Partial Refund, Restrictive Drop/Add Deadline:
- add a course (requires instructor and adviser signatures)
- drop a course with partial refund and grade of “W”

W Drop/Withdraw Deadline:
- drop a course with automatic grade of “W” (requires adviser signature)
- withdraw from all courses with automatic grades of “W” (requires completed Withdrawal Form)

W/F Withdraw Deadline:
- withdraw from all courses with assigned grades of “W” or “F” (requires completed Withdrawal form)
The Administration

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Dr. Ronald H. White—Vice Chair, Oklahoma City
Jay Helm—Secretary, Tulsa
Joseph L. Parker, Jr.—Assistant Secretary, Tulsa
James D. "Jimmy" Harrel—Member, Leedey
Ann Holloway—Member, Ardmore
Andy W. Lester—Member, Edmond
Gen. Toney Stricklin—Member, Lawton
Michael C. Turpen—Member, Oklahoma City
Dr. Glen D. Johnson—Chancellor

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Douglas E. Burns—Vice-Chair, Norman
Calvin J. Anthony—Member, Stillwater
Jarold Callahan—Member, Yukon
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Joe D. Hall—Member, Elk City
Tucker Link—Member, Finley
Dr. Trudy Milner—Member, Tulsa
Jim Reese—Member, Nardin
Jason Ramsey—Chief Executive Officer, Edmond

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Chris Batchelder, BS—President, OSU Alumni Association
Lee E. Bird, PhD—Vice President for Student Affairs
Gary C. Clark, JD—Senior Vice President and General Counsel
Thomas Coon, Ph.D—Vice President for Agricultural Programs and Dean of the Division of Agricultural Sciences and Natural Resources
Mike Holder, MBA—Vice President for Athletic Programs and Director, Intercollegiate Athletics
Kirk Jewell, BS—President and Chief Executive Officer, OSU Foundation
Jason Kirksey, PhD—Vice President of Institutional Diversity
Kenneth Sewell, PhD—Vice President for Research
Gary Shutt, BS—Director, Communication Services
Joseph Weaver, MS—Senior Vice President for Administration and Finance
Kyle Wray, MA—Vice President for Enrollment Management and Marketing

Academic Deans
Thomas Coon, Ph.D—Dean of the Division of Agricultural Sciences and Natural Resources and Vice President of Agricultural Programs
Bret S. Danilowicz, PhD—Dean of the College of Arts and Sciences
John Romans, PhD—Dean of the College of Education
Kenneth Eastman, PhD—Dean of the Spears School of Business
Keith Garbutt, PhD—Dean of the Honors College
Sheila G. Johnson, MLS—Dean of Libraries
Chris Ross, DVM, PhD—Interim Dean of the Center for Veterinary Health Sciences
Paul J. Tikalsky, Ph.D—Dean of the College of Engineering, Architecture and Technology
Sheryl Tucker, PhD—Dean of the Graduate College
Stephan M. Wilson, PhD—Dean of the College of Human Sciences

Selected administrators directly responsible for academic and service programs for students:
Laurie Beets, MS—Bursar
Chad Blew, BS—Director of Scholarships and Financial Aid
Christine Crenshaw, MBA—Director of Undergraduate Admissions
Pamela Fry, EdD—Associate Provost, Undergraduate Education
Jessica Roark, MA—Director of Scholar Development and Undergraduate Research
K. Celeste Taber, PhD—University Registrar
Missy Wilde, MA—Director of First Year Experience

2016-2017 University Catalog
Welcome to Oklahoma State University!

We are delighted you are pursuing your all-important higher education degree at OSU.

This catalog shows the incredible breadth of academic offerings available to you at OSU. With more than 300 undergraduate and graduate degree programs and options, as well as professional degree programs in medicine and veterinary medicine, OSU provides outstanding choice and value at a comprehensive research university.

Oklahoma State University is proud of its heritage as one of our nation’s leading land-grant universities and remains fully committed to the land-grant mission of teaching, research and outreach. We provide a creative, innovative, collaborative learning environment that prepares students to use their knowledge to become active citizens and positive leaders who will make the world a better place.

We are glad you are here at Oklahoma State University and wish you all the best as you prepare for a world of possibilities.

V.Burns Hargis
The University

The History
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, no buildings, books or curriculum existed. Since its beginning as a land-grant institution, OSU has held true to the land-grant mission of instruction, extension and research.

In 1894, two and one-half years after classes began in local churches, 144 students moved into the first academic building, later named Old Central, which is still located on the southeast corner of campus and today houses the OSU Honors College. In 1896, Oklahoma A&M held its first commencement with six male graduates.

On July 1, 1957, Oklahoma A&M College became Oklahoma State University. Technical branches were established in Okmulgee in 1946 and in Oklahoma City in 1961. In 1990 these two technical branches were renamed OSU-Okmulgee and OSU-Oklahoma City; and in 2008 OSU-Okmulgee was renamed OSU Institute of Technology. OSU-Tulsa was formed in 1999 from a consortium of universities that were originally established in 1982. In July of 1988, the Oklahoma College of Osteopathic Medicine and Surgery (in Tulsa) became the College of Osteopathic Medicine of OSU. In 2001, it became part of the OSU Center for Health Sciences, which also has an affiliation with its primary teaching hospital, the OSU Medical Center.

OSU is located in Stillwater, a north-central Oklahoma community with a population of around 50,000. 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 daily air service from Stillwater, as well as Tulsa and Oklahoma City. This coeducational University has an enrollment of more than 35,000 students on five campuses. It offers bachelor’s, master’s and doctor’s degrees in a large number of fields, as well as the professional Doctor of Osteopathic Medicine 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 the Oklahome 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.

As a comprehensive land-grant institution, OSU offers students many distinct advantages. It has nearly four million volumes in the library’s collection; modern research laboratories and equipment; excellent physical education; recreation and student union facilities; nearly 500 student organizations; nationally-recognized residence hall programs; outstanding cultural and Big 12 Conference athletic events; and nearly 40 nationally-affiliated fraternities and sororities that provide a stimulating educational and social environment.

The Mission
Proud of its land-grant heritage, Oklahoma State University advances knowledge, enriches lives, and stimulates economic development through instruction, research, outreach and creative activities.

Student Profile
Oklahoma State University has a diverse student body. Students come not only from Oklahoma, but from across the nation and world. Of OSU’s more than 35,000 students, approximately 70 percent are on the Stillwater campus, including students at the Center for Veterinary Health Sciences. The remaining student population is spread over the OSU System’s four other campuses: OSU-Oklahoma City, OSU Institute of Technology in Okmulgee, OSU-Tulsa and the OSU Center for Health Sciences in Tulsa. Seventy percent of the undergraduates enrolled are Oklahoma residents; 26 percent are out of state residents; and four percent from 119 foreign countries. Of the undergraduate population, 51 percent are men and 49 percent are women. Domestic minorities make up approximately 27 percent of the undergraduate student body. The six-year graduation rate of first-time full-time, degree-seeking undergraduate students is 62 percent.

There are more than 5,700 graduate students throughout the OSU System. Over 4,300 of those students are on the Stillwater campus. Of those, 47 percent are Oklahoma residents; 28 percent are out of state residents; and 25 percent from foreign countries. Fifty-four percent of graduate students are men and 46 percent are women. Domestic minorities make up 16 percent of the graduate student body.

An annual report regarding gender equity in OSU’s athletic programs is available upon request from the Athletic Department.

Research
Research has been one of the three essential components of the OSU mission since the University’s inception. It adds richness, depth, and broader impact to the other mission components of teaching and outreach. In the sciences and engineering, basic research advances the frontiers of disciplinary knowledge, whereas applied research improves quality of life and economic prosperity by bringing new products, processes and medicines to the marketplace. Research and creative innovations, the arts and humanities enhance how human beings view and understand the world we live in.

OSU’s faculty and student researchers are engaged in research across the full spectrum of human endeavor and inquiry, including areas of state and national priority. In addition to disciplinary research in virtually all academic units on campus, OSU is strong in several areas of interdisciplinary research. Researchers in the food-energy-water nexus span agricultural innovation, nutrition, engineering, toxicology, geosciences, economics, and the social behavioral sciences. OneHealth, an interdisciplinary framework that recognizes the interconnections between human health, animal health, and a healthy planet, likewise includes research as diverse as veterinary medicine, ecology, psychology, exercise science, and bioengineering... as well as basic research in the bench sciences. Unmanned systems research (including unmanned aircraft) brings researchers from several engineering disciplines together with experts in production agriculture, computer science, information systems, and aviation to develop technology to create management tools, and new applications for this burgeoning field. Such interdisciplinary research strengths are enhanced by big data solutions, including OSU’s high performance computing facilities and advanced analytical expertise

The Division of the Vice President for Research administers research across the OSU System. The division is comprised of the following units:

- Research Administration (research.okstate.edu) is responsible for research governance, operations and special programs including OSU Research Week, the Regents Distinguished Research Awards, and the Niblack Research Scholars program. Other areas of administration by the office include conflict of interest, complaints of scientific misconduct, core facilities and facilities renovation/development programs, and the University cost-share and University start-up programs.
- The University Center for Proposal Development (ucpd.okstate.edu) works closely with faculty, staff and administration across colleges and campuses at OSU to develop strong and competitive external funding proposals. An experienced grant writer is available to provide a wide range of pre-award services, advice and information to strengthen and enhance proposal quality.

The Office of University Research Compliance (compliance.okstate.edu) ensures OSU follows federal, state and University regulations that set forth requirements for certain kinds of research. Working through faculty committees, it oversees research involving human subjects, animal models, radiological materials, certain hazardous agents and recombinant DNA.

The Office of University Research Services (urs.okstate.edu) is the document control center for the routing of all proposals and awards throughout the University. It provides support to faculty and staff (through information about funding opportunities, and training seminars); posts online research expenditures and abstracts; and provides guidance for compliance with federal export control regulations that govern the conduct of research and export of specific technologies that may have an impact on national security and trade. The High Performance Computing Center (hpc.it.okstate.edu) provides supercomputing services and computational science expertise that enables faculty, staff, and students to conduct a wide range of focused research, development, and test activities. Its main objective is to facilitate research and aid in educational advancement by integrating state-of-the-art high performance computing technology for multidisciplinary units across the OSU campus and throughout Oklahoma.

The National Energy Solutions Institute (nesi.okstate.edu) fuses the needs of private industry in energy production, distribution and conservation with practical and impactful academic research. Working through faculty committees, it oversees research involving human subjects, animal models, radiological materials, certain hazardous agents and recombinant DNA.

The Oklahoma State University Research Foundation (OSURF) (osurf.org) has supported technology development and commercialization on behalf of OSU. OSURF also manages the OSU Research Park and other strategic resources that can connect OSU researchers to industry and other partners. OSURF is comprised of the following units:
- The Technology Development Center (tdc.okstate.edu) manages OSU’s innovative technologies and other intellectual property for the benefit of the University and the public. In carrying out this mission, personnel work with faculty, staff, administrators and students to protect OSU’s intellectual property and license it to commercial firms.

Cowboy Technologies (cowboystech.com) is a for-profit, limited-liability company with a mission to be a catalyst for commercializing university

2016-2017 University Catalog
inventions. The company goals run parallel with that of OSU’s land-grant mission of taking University research from “Campus to Community”.

The University Multispectral Laboratories (UML) is a “trusted agent” Research, Development, Test, and Evaluation (RDT&E) entity certifying for over 20 years a wide variety of military government research, and academia. The UML fuses academic, technical, and tactical perspectives for RDT&E systems integration to better advance technology from bench top to the end user.

Research Centers and Facilities. OSU has multiple research centers and facilities throughout the university. The Advanced Technology Research Center houses programs from the College of Engineering, Architecture and Technology. The Robert M. Kerr Food & Agricultural Products Center provides large and small businesses, producers and entrepreneurs access to faculty and staff with expertise in business and technical disciplines. The FAPC seeks to develop successful value-added enterprises in Oklahoma. The Noble Research Institute houses programs from OSU’s geology, entomology & plant pathology and biochemical & molecular biology departments. The OSU Microscopy Laboratory is a multi-disciplinary facility for materials science research spanning from nanotechnology to biology and medicine. The lab offers microscopy support for research projects by OSU students, faculty and staff as well outside entities on a fee basis. The Helmerich Advanced Technology Research Center is a state-of-the-art research, development, testing and education center located on the OSU-Tulsa campus. Faculty from mechanical engineering, electrical engineering and materials science and engineering work collaboratively there on research and graduate education.

The Henry Bellmon Research Center houses six of OSU’s internationally recognized interdisciplinary research programs: synthetic chemistry, biodiversity, biophysics, photonics, bioforensics, and biogeophysics. Completed in 2010, the HBRC is the first Stillwater campus building dedicated exclusively to research. The OSU Research Park is a 160-acre site uniquely designed for collaboration among tenants while promoting custom facilities for technology-based or industry-driven companies in all stages of development. The Venture I building consists of OSU and private-sector labs while the Michael S. Morgan Business Accelerator Building is designed to support and serve as an engaged-based start-up. More detailed information about OSU’s research centers, institutes or core facilities, visit research.okstate.edu/core-facilities.

Outreach

International Studies & Outreach (IS&O) – iso.okstate.edu – Oklahoma State University’s long and proud tradition of excellence in International Studies and Outreach has its roots in the post-World War II era when US President Harry S. Truman appointed OSU President Henry G. Bennett as the first chief executive officer of the Point Four Program. This program is known today as the United States Agency for International Development (USAID). Over the past half-century, hundreds of faculty members have served abroad on numerous projects sponsored by the United States Government and private foundations. Faculty members are increasingly engaged in research and outreach dealing with the university’s tradition of international development and scholarship on global issues. Dr. Henry G. Bennett’s international legacy and OSU’s long-standing dedication to international relations and outreach is evident in the university’s continued international endeavors and significant international service and leadership. OSU also offers significant on-campus scholarship programs: International Relations, International Experience, and International Business and Economic Relations; International Human Development, Society and Education; Preservation of Environmental and Ecological Resources; and Culture, Heritage, and Tourism Development and two to three elective courses. Students are also required to participate in an international experience. Students complete this degree with either a thesis or a creative component. The SIS graduate program also offers a dual degree option with two universities in Mexico: Universidad Popular Autónoma del Estado de Puebla (UAPAP) and Universidad de las Americas (UDLA).

Master’s International Program (MIP) — This program provides the opportunity to incorporate Peace Corps (PC) International Field Work into the MS in International Studies degree plan. Candidates complete 24 credit hours before entering the Peace Corps. After completion of their service, students return and enroll in an additional nine hours to finish their degree. These final hours involve preparing reports related to their activities in the Peace Corps.

Graduate Certificate of Global Issues — After completion of a bachelor’s degree, students can receive a Certificate in Global Issues by taking 15 credit hours in International Studies. Certificate students complete three of the core courses and two courses selected from a focus area.

Graduate Certificate in International Disaster and Emergency Management – Offered in collaboration with OSU’s Fire and Emergency Management graduate program, this interdisciplinary graduate certificate combines 18 hours of coursework in International Studies and Fire and Emergency Management Administration. It is suitable for those seeking expertise in dealing with natural and man-made disasters and subsequent relief efforts.

Undergraduate Minor in International Studies — All undergraduate students at Oklahoma State University (OSU) may obtain an international studies minor, regardless of their primary academic major. Courses within the minor encourage students to understand social, political, economic and cultural contrasts throughout the world. The minor internationalizes students by encouraging students to develop their foreign language skills by participating in study abroad or service learning experiences abroad prior to graduating. Furthermore, this will provide formal evidence of international study on one’s transcript and resume that may otherwise not be evident. The minor in international studies will also increase demand for OSU’s international-related courses with a resulting increase in course development and offerings. Students will structure their minor from three clusters of courses and learning experiences encompassing International Decision Making (6 credit hours), International Environmental (9 credit hours) and International Experience (3 credit hours). In addition, each student must complete 10 credit hours of a foreign language or demonstrate proficiency through examination. International students will be exempt from the International Experience.

The Study Abroad Office coordinates reciprocal exchange agreements with over 80 institutions in 35 countries, as well as affiliated programs and the National Student Exchange. The office provides personalized advising on long-term study, research, internships, teaching and service programs abroad. Academic support and pre-approval of courses to be taken abroad, along with support both during and after the international sojourn, are provided for all interested students. Study abroad programs offer students the opportunity to experience different peoples, languages and customs and to gain essential work experience to provide an undergraduate student with a meaningful international experience prior to graduation, which study abroad can fulfill. Two one-credit courses are offered by the study abroad staff to help students maximize their experience abroad. The office also administers three International Studies & Outreach fellowships that support graduate study abroad participation - the Provost’s Study Abroad Scholarship, the Don and Cathey Humphreys Scholarship, and the Gerry Auel First Passport Grant.

The English Language Institute (ELI) was established in 1970. ELI’s mission is to equip its students with the English proficiency, academic skills, and cultural knowledge necessary to gain entrance to and achieve success at Oklahoma State University, or any American institution of higher education. In addition, English language and culture programs can be tailored to meet the needs of educational institutions, businesses and government sponsoring agencies. Regularly enrolled OSU international students who feel a need for additional language study may enroll part-time in ELI as well.

Institute students, who may represent as many as 25 or 30 different countries in any given semester, range from recent high school graduates to career professionals returning to school for master’s or doctoral degrees. Assigned to one of six levels of instruction by means of a placement exam, all students spend a minimum of 20 hours per week in class. The ELI has three terms: spring, summer and fall and offers mid-semester arrival in spring and fall. Classes offered include listening/speaking, reading, composition, grammar, and optional electives.

For more information, contact the English Language Institute, 307 Wes Watkins Center, 405.744.7519, e-mail to eus-eli@okstate.edu or visit eus.eli.okstate.edu.

The International Outreach Unit (IO) promotes international research, education and development on behalf of the Oklahoma State University and the state of Oklahoma through building worldwide linkages; pursuing and coordinating collaborative projects; and reaching out to state, national and international audiences. During Spring, Summer and Winter, the IO Unit serves and provides high quality short-term academic programs for foreign individuals in order to achieve and maintain a global mindset in the participants. The three (3) programs are: Experience Oklahoma, Faculty Led and High School Summer Academic.
IO houses the following components:

The OSU-Mexico Liaison Offices are housed in the Wes Watkins Center and supported by the Division of International Studies & Outreach. The OSU-Mexico Liaison Offices provide international programs and services to OSU students, faculty, and staff. The OSU-Mexico Liaison Offices are also a major resource for Mexican students studying in the United States.

The Fulbright Resource Center assists students, recent graduates, faculty, and members of the international community with the application process for Fulbright Grants for international opportunities in research, study, teaching, or creative activities abroad. The Fulbright Grant is a highly competitive national award established in 1946 by J. William Fulbright to increase international understanding through educational exchange. Awards are offered annually for international travel, short- and long-term assignments in over 140 countries around the world.

Peace Corps Support is provided by IS&O as needed for a regional Peace Corps recruiter who visits OSU to recruit students and provide Peace Corps information at various learning and career fairs. Oklahoma State University has produced over 450 Peace Corps volunteers.

Phi Beta Delta is an international honor society dedicated to recognizing scholarly achievement in international education. The Phi Beta Delta Epsilon Upsilon chapter was founded in 2003 at OSU and currently has over 288 members. Students, faculty and staff with international experience and service are encouraged to apply for this prestigious honor society for international scholars.

OSU Correspondence Education – In order to provide higher education opportunities to underserved or restricted populations, OSU provides a variety of courses via correspondence education (CE) to individuals across the state, nation and world using various media and partnerships with academic units at OSU. Individuals enrolled in correspondence education courses would often otherwise be unable to access higher education due to work, family responsibilities, physical isolation or medical conditions that may preclude participation in regularly scheduled class meetings. OSU offers approximately 100 CE courses for college credit and continuing education units (CEUs). For most CE courses, students may enroll at any time without being admitted to OSU and credits are awarded once each year or semester. CE courses are offered in different formats such as web or DVD/online courses. For more information on correspondence education go to http://ocs.okstate.edu or email to ocampus@okstate.edu. For other distance learning programs at OSU, contact the O-Campus help line at 405.744.6786.

Wes Watkins Center Conference and Meeting Services – meetings@okstate.edu – Provides meeting spaces and services for the needs of Oklahoma State University, the Stillwater Community, the State of Oklahoma, and off-campus constituents. The department acts as administrator of the facilities which are housed in the Wes Watkins Center for International Trade and Development, International Studies & Outreach, the English Language Institute, and Correspondence Education and Testing Center.

Wes Watkins Meeting & Conference Services offers over 42,000 square feet of meeting space, including the largest meeting venue on campus. The department works with event planners to coordinate complete meeting services, including event logistics consultation, in-house catering and several off-site caterers to choose from for catered events, and parking details.

The Wes Watkins Center, in conjunction with the Student Union, serves as a central location for international events, business meetings, social functions, and conferences at OSU.

Wes Watkins Center for International Trade and Development - citd.okstate.edu - The Wes Watkins Center for International Trade and Development (CITD) is a part of the Oklahoma Small Business Development Center (OSBDC) network and provides Oklahoma’s small and medium sized businesses with hands-on high quality and confidential one-on-one counseling to help begin exporting or to expand the export of goods and services. The area of international trade, the CITD is part of the Oklahoma Small Business Development (OKSBD) network and provides Oklahoma’s small and medium sized businesses with hands-on high quality and confidential one-on-one counseling to help begin exporting or to expand the export of goods and services.

OSU Outreach Administration – Outreach programs and courses aim to support the land-grant mission of OSU by making education more accessible and by responding to industry, government, educator, individual, and community educational needs. The academic college-based Outreach Offices provide support services for credit Distance Learning programs and may include undergraduate online courses/degrees, online master degrees, undergraduate print correspondence courses, and global learning experiences. Non-credit educational opportunities may include: alternative credentials, professional development through seminars and conferences, applied research and assistance/technology transfer, publications, community development, and high-impact educational learning activities. The courses/programs are offered by college faculty, adjunct faculty/speakers, and staff. The Office of International Studies & Outreach (IS&O) provides support of these outreach programs at the university level through committee work, credit course coordination, data system support, and report coordination.

For more information about IS&O, contact: International Studies & Outreach, 405.744.6606, iso.okstate.edu

General Education

Oklahoma State University is committed to producing graduates who have a depth of knowledge in their major fields of study and a breadth of general knowledge to address issues in a complex society. OSU graduates have a breadth of education in specific subject areas.

With a commitment to breadth in general education, the following philosophy was adopted in 2001.

General Education at Oklahoma State University provides students general knowledge, skills and attitudes conducive to lifelong learning in a complex society. Specifically, general education at Oklahoma State University was intended to construct a broad foundation for the student’s specialized course of study; develop the student’s ability to read, observe and listen with comprehension; enhance the student’s skills in communicating effectively; expand the student’s capacity for critical analysis and problem solving; assist the student in understanding and respecting diversity in people, beliefs and societies; and develop the student’s ability to appreciate and function in the human and natural environment.

General education courses are aligned with one of four content areas: analytical and quantitative thought (A), humanities (H), natural sciences (N), and social and behavioral sciences (S). In addition, OSU students must participate in an international dimension course (I) and in natural sciences courses that include a lab component and have a scientific investigation (L) designation. As of Fall 2017, these courses are referred to as core courses. A course is qualified to be part of the general education curriculum if it meets the needs of students in all disciplines without requiring extensive specialized skills and satisfies all the criteria for a specific general education area. The criteria for each general education area follow:

Analytical and quantitative thought (A) courses incorporate the study of systems of logic and the mathematical sciences and place primary emphasis on the development of the intellect through inductive and/or deductive processes. Their aim is broader than proficiency in techniques and includes appreciation of how these techniques can supplement and provide ways to analyze concrete problems. Goals of “A” courses are to prepare students to critically analyze and solve problems using quantitative, geometric or logical models; form inferences using logical systems and mathematical information and communicate them in writing; give appropriate multiple representations (e.g., graphical, numerical or verbal) of logical or mathematical information; and estimate, analyze, or check solutions to problems to determine reasonableness, alternative solutions, or to determine optimal methods or results.

Diversity (D) courses emphasize one or more socially constructed groups (e.g., racial, ethnic, religious, gender, age, disability, sexual orientation) in the United States. Goals of “D” courses are to prepare students to critically analyze historical and contemporary examples of socially constructed groups in American society or culture and the distribution of political, economic, and cultural benefits and opportunities afforded to these groups; to understand how these groups relate to the student’s academic discipline and American culture; and demonstrate their understanding through written work that provides them the opportunity to enhance their writing skills.

Humanities (H) courses concentrate on the expression, analysis and interpretation of ideas and the aesthetics of values that have formed and informed individuals and societies; and emphasize diversity in the expression of human ideas and aesthetic or cultural values. Goals of “H” courses are to prepare students to critically analyze the relationships of aesthetics, ideas, or cultural values to historic and contemporary cultural contexts; to demonstrate understanding of how ideas, events, arts or texts shape diverse individual identities; and demonstrate their understanding through written work that provides them the opportunity to enhance their writing skills.

Contemporary international culture (I) courses emphasize contemporary cultures outside the United States. Goals of “I” courses are to prepare students to critically analyze one or more contemporary cultures external to the United States; understand how contemporary international cultures relate to complex, modern world systems; and demonstrate their understanding through written work that provides them the opportunity to enhance their writing skills.

Scientific investigation (L) courses include the equivalent of at least one semester credit hour of laboratory experience aimed at interpreting scientific
hypotheses and emphasize scientific inquiry and experimental methodology. Goals of "L" courses are to prepare students to critically analyze scientific problems, formulate hypotheses, conduct appropriate experiments, and interpret results; solve problems using scientific inquiry and experimental methodology; communicate procedures, results and conclusions to others; and demonstrate their understanding of written work within the discipline that provides them the opportunity to enhance their writing skills.

Natural science (N) courses feature the systematic study of natural processes, and the mechanisms and consequences of human intervention in those processes; and provide primary emphasis on the subject matter of one or more basic physical or biological sciences in a broadly integrative fashion. Goals of "N" courses are to prepare students to understand the scientific inquiry process; critically analyze the physical world using the language and concepts of science; use the methodologies and models of science to select, define, solve, and evaluate scientific problems; develop experimental and practical skills; and interpret, analyze, evaluate evidence, results, and solutions related to the physical and biological sciences; understand the consequences of human intervention in natural processes; and demonstrate their understanding through written work that provides them the opportunity to enhance their writing skills.

Social and behavioral sciences (S) courses propose theoretical constructs to explain human behavior and society in social and/or physical environments; and are based on empirical observation of human behavior rather than the study of aesthetics, ideas or cultural values. Goals of "S" courses are to prepare students to critically analyze generalizations about society and explore theoretical structures; understand the role of empirical observation in the social and behavioral sciences; and demonstrate their understanding through written work that provides them the opportunity to enhance their writing skills.

Accreditation

Oklahoma State University is accredited by the Higher Learning Commission (HLC) and programs within the colleges are also accredited. (The HLC may be reached at 230 South LaSalle Street, Suite 7-500, Chicago, IL 60604-1411, Phone: 800.621.7440/312.263.0456 | Fax: 312.263.7462 | info@hlcommission.org.)

In the College of Agricultural Sciences and Natural Resources, the undergraduate program in biochemistry and molecular biology is accredited by the American Society for Biochemistry and Molecular Biology. The forestry curriculum is accredited by the Society of American Foresters. The landscape architecture program (Bachelors of Landscape Architecture) is accredited by the American Society of Landscape Architects (ASLA). The landscape management program is accredited by the National Association of Landscape Professionals (NALP). The professional education program in agricultural education is accredited by the Council for the Accreditation of Educator Preparation (CAEP) formerly known as the National Council for Accreditation of Teacher Education (NCATE). In addition, the undergraduate biosystems engineering program is accredited by Engineering Accreditation Commission (EAC) of ABET as a component of associated engineering programs in the College of Engineering, Architecture and Technology.

In the College of Arts and Sciences, the chemistry program is certified by the American Chemical Society; the program in communication sciences and disorders is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology; the School of Media and Strategic Communications, which offers programs in multimedia journalism, sports media, and strategic communication, is accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC); the Clinical Laboratory Sciences program is accredited by the Commission on Accreditation for Clinical Laboratory Sciences; the Department of Music is accredited by the National Association of Schools of Music; the program in clinical psychology is accredited by the American Psychological Association; and the Department of Theatre is accredited by the National Association of Schools of Theatre (NAST). In the College of Education, the Aviation Management and Professional Pilot options are accredited by the Aviation Accreditation Board International (AABI). The counseling psychology and school psychology programs are both accredited by the American Psychological Association. The school counseling and counselor counseling programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The school psychology program is also accredited by the National Association of School Psychologists. The Recreational Therapy Program is accredited by the Commission on Accreditation of Recreational Therapy Education (CARET) through the Commission on Accreditation of Allied Health Education Programs (CAHEP) which is accredited by the Council on Higher Education Accreditation (CHEA). The Recreation Management program is accredited by the Council on Accreditation for Recreation, Park and Tourism Administration (COAPT); COAPT which is accredited by the Council on Higher Education Accreditation (CHEA). All Professional Education programs are accredited through the Council for the Accreditation of Educator Preparation (CAEP) formerly named the National Council for Accreditation of Teacher Education (NCATE).

In the College of Engineering, Architecture and Technology, bachelor's degree programs are accredited by nationally recognized accreditation organizations. Programs in aerospace engineering, architectural engineering, biosystems engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering and management, and mechanical engineering are accredited by the Engineering Accreditation Commission (EAC) of ABET. Programs in construction management technology, electrical engineering technology, fire protection and safety technology, and mechanical engineering technology programs are accredited by Technology Accreditation Commission (TAC) of ABET, Inc., http://www.abet.org. The program in architecture is accredited by the National Architectural Accrediting Board (NAAB).

Programs culminating in a baccalaureate degree in the College of Human Sciences are accredited by the Student Affairs Accreditation Commission (SAAC). The Council for Interior Design Accreditation (CIDA) has accredited the undergraduate interior design program. The pre-production and the production management apparel curricula is endorsed by the American Apparel and Footwear Association (AAFA) Education Foundation, making it one of only 13 approved programs in North America. The Department of Communication Sciences and Disorders, which offers programs in Speech-Language Pathology, is accredited by the Oklahoma Department of Human Services (DHS) and has received a Three Star Differential Quality Certification from the Department of Human Services. The Child Development Lab/Rise School is also accredited by the National Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995, ph. 312.899.0040 ext 5400.

The Spears School of Business is accreditied by AACSB International - The Association to Advance Collegiate Schools of Business, which is the premier accrediting agency for bachelor's, master's and doctoral degree programs in business administration and accounting. AACSB International accreditation represents the highest standard of achievement for business schools, worldwide. Institutions that earn accreditation confirm a commitment to quality and continuous improvement through a rigorous and comprehensive peer review process. All Spears programs are AACSB accredited with the exception of the M.S. in Economics and the PhD in Economics which do not come under the AACSB's scope of review. The School of Accountancy is separately accredited, and is fully accredited by AACSB. There are only 182 schools worldwide that have attained this status for both business and accounting programs.

The Center for Veterinary Health Sciences is fully accredited by the American Veterinary Medical Association’s Council on Education. The Oklahoma Animal Disease Diagnostic Laboratory is accredited by the American Association of Veterinary Laboratory Diagnosticians, and the Boren Veterinary Medical Teaching Hospital is accredited by the American Animal Hospital Association.

The animal care programs of the Center for Veterinary Health Sciences, the College of Human Sciences, and the College of Engineering, Architecture and the Built Environment are accredited by the Association of Accreditation Laboratory Animal Care, International (AALAC). AALAC International is a private, nonprofit organization that promotes the humane treatment of animals in science through voluntary accreditation and assessment programs. AALAC International accreditation shows that an institution is serious about setting, achieving and maintaining high standards for animal care and use and is committed to animal welfare in science. AALAC International offers the only international accreditation for animal care and use programs, and it has become recognized around the world as a sign of quality science.

Programs at OSU’s branch campuses have also received accreditation from national agencies.

The College of Osteopathic Medicine at the Center for Health Sciences is accredited by the Commission on Osteopathic College Accreditation (COCA) of the American Osteopathic Association.

OSU-Oklahoma City is accredited by the Higher Learning Commission. In addition, other programs are accredited or certified by the following institutions: National Association for the Education of Young Children, State Health Department for Emergency Medical Technicians, Council on Law Enforcement Education and Training, Council for Accreditation of Emergency Medical Personnel (CoAEMSP). Accreditation Commission for Education in Nursing (ACEN), 3343 Peachtree Road NE, Suite 850, Atlanta, GA 30326, 404.975.5000, Oklahoma Board of Nursing (OBN), American Veterinary Medical Association Committee on Veterinary Technician Education and Activities, Accreditation Council for Education in Nutrition & Dietetics (ACEND), Joint Review Committee on Education in Diagnostic Medical Sonography (JRCDSM), through the Commission on Accreditation of Allied Health Education Programs (CAAEHP), 1361 Park Street, Clearwater, FL 33756, 727.210.2350. The International Fire Service Accreditation Congress (IFSCA), 1812 Tyler Avenue, Stillwater, OK 74078, 405.744.8308

OSU Institute of Technology, Okmulgee is accredited by the Higher Learning Commission. Programs in Automotive Service Technologies and Automotive

Programs at OSU-Tulsa are fully accredited by the Higher Learning Commission, carrying the same accreditation as programs on the Stillwater campus. Refer to individual colleges for the specific agencies.

Refer to the appropriate college sections in this Catalog for further information on accreditation of specific programs.

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, and the tradition of excellence established by the student-athletes. Opportunities for student-athletes are provided without discrimination. OSU is a member of the highly competitive Big 12 Conference.

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 more than 200 permanent buildings. These facilities include the Edmon Low Library, ranked first in the state of Oklahoma and one of the largest libraries in the entire Southwest. Other facilities include the nation's largest and newly renovated Student Union, Old Central (the University's original, first permanent structure on campus), the Henry Bellmon Research Center, Noble Research Center, Donald W. Reynolds School of Architecture, the Bartlett Center for the Visual Arts, and the Center for Performing Arts.

In 2006, OSU launched its campus Master Plan 2025, calling for more than $850 million in projects to improve facilities in four areas: academics, student life, infrastructure, and athletics. The historic and far-reaching plan is transforming the OSU campus.

The North Classroom building, a joint project between OSU and Northern Oklahoma College, opened in part by the state's Higher Education Capital Bond Program, opened on the north side of the Stillwater campus in April 2006. The facility offers the latest in teaching technology and features an all-organic café.

The Multimodal Transportation Terminal and 1,100-space Monroe Street Garage opened in fall 2008. The parking facility is a central point of connection for various modes of transportation serving OSU-Stillwater and the OSU branch campuses, as well as the community and surrounding area. Two-thirds of the funding for the facilities came from a Federal Transit Administration grant. A second parking garage on the southwest corner of campus opened in the spring of 2013, and yet another multi-level parking garage is now under construction on the south side of University Avenue.

The impressive Henry Bellmon Research Center opened in 2010. The $70 million building, which is the largest project in the state’s Capitol Bond Program, provides state-of-the-art laboratory space for a wide-range of disciplines and encourages collaborative research.

OSU opened several renovated buildings in 2009. Thanks to a gift from the Donald W. Reynolds Foundation, OSU doubled the size of the building housing its School of Architecture. Historic Old Central, built in 1894, was renovated and remodeled to house the Honors College. The renovations to Old Central have won numerous architectural awards. Murray Hall, built as a women’s dormitory in 1933, was renovated to house seven departments from the College of Arts and Sciences.

A $36 million facelift to OSU’s prestigious Student Union has greatly enhanced facilities and services to students. Campus Life is now prominently located on the first floor providing a focal point for the student union and offering expanded facilities. The Center for Services to Students area continues to house the Bursar, Registrar, Scholarship and Financial Aid, Undergraduate Admissions and the Learning and Student Success Opportunity Center in one convenient location to better serve students.

OSU has completed a renovation of the downtown Stillwater Postal Plaza into a gallery to showcase OSU art. On the northwest side of campus, OSU completed a new information technology building in late 2014 to centralize IT employees and in early 2015 OSU opened a new library auxiliary building to house printed volumes and free space in the Edmon Low Library to better meet the study and online research needs of today’s students. A new Veterinary Medicine Academic Center opened in 2012.

In 1997, the Spears School of Business and, a major expansion of the Human Sciences building is nearly complete. OSU is moving forward with plans for a new performing arts center south of campus, and the construction of a new central plant north of campus is underway.

The renovation of the west end of Boone Pickens Stadium expanded spectator seating to 60,000 and created one of the premier collegiate football facilities in the country. The University recently completed several athletic projects north of Boone Pickens Stadium. OSU opened the Sherman E. Smith Training Facility (the football training center) and a new softball field in 2013. The Michael and Anne Greenwood Tennis Center opened in early 2014. The new tennis center features six indoor and 12 outdoor courts and is one of the leading collegiate tennis facilities in the country. Athletics also is pursuing funds for a new baseball facility and moving forward with plans for a new soccer field.

Prior to the launch of Master Plan 2025, construction and renovation brought a number of enhancements to the campus. In 1995, Willard Hall was completely renovated and became home to the College of Education. Willard was a 1893 vintage women’s dormitory. For its efforts in the Willard project, OSU received an architectural award for the historic preservation of the building and the individual. Donald W. Reynolds Foundation, OSU doubled the size of the building housing the Robert M. Kerr Food and Agricultural Products Center, dedicated in 1996, supports the essential mission of the College of Agricultural Sciences and Natural Resources by allowing faculty and students the opportunity to investigate the ways and means of adding value to Oklahoma’s raw foodstuffs.

The College of Engineering, Architecture and Technology opened its $31 million Advanced Technology Research Center in 1997. This multidisciplinary building enhances the University's role as a front-runner in basic engineering and related research in a variety of fields that are relevant to Oklahoma, the United States and the world.

A renovation of the Classroom building was completed in 1998. This building is the principal undergraduate classroom facility for the University. The Classroom building remodeling effort gives students an updated facility with state-of-the-art teaching systems.

The first of four phases of apartments and suite-style accommodations for new student housing was completed in 2000. Phase II, completed in the fall of 2001, included family housing, apartments and suites. Phase III student housing opened in fall 2003, and the fourth phase of on-campus student housing was completed and opened in 2006. OSU has expanded campus bus service for both the Stillwater community and the OSU-Stillwater campus to aid students, faculty and staff in their educationally related transportation. Additionally to reduce energy costs and emissions, OSU converted its entire fleet of campus buses to compressed natural gas in 2010.

In 2001, OSU constructed the new Athletic Center. The Athletic Center was built on the site of Gallagher-Iba Arena. The top of the original building was removed, and the new Athletic Center was built over and around the arena. The arena seating was expanded to 16,000, and the arena was renamed Gallagher-Iba Arena resulting in the expansion of its seating to approximately 13,000 for athletic, academic and entertainment activities. Historic Gallagher-Iba now continues to exist as the arena within the Athletic Center. OSU’s basketball locker rooms within the Athletic Center were upgraded in 2010 for both men and women. In 2004, a state-of-the-art academic center also was built within the building.

Fall 2004 saw the reopening of the Colvin Recreation Center after a major renovation and expansion. The facility was originally constructed in the late 1960’s and was in need of modernization and more space. The project included a new outdoor pool, climbing wall, expanded workout and locker space, and indoor jogging track.

Improvements continue in the University's outdoors spaces as well, and a landscape architectural master plan developed in 2010 guiding those efforts. Major east-west streets, Hall of Fame Avenue and University Avenue have been greatly updated, and the university completed the design and reconstruction of Monroe Street, which runs north-south through the heart of the campus. A series of landscape projects near student residential facilities have occurred in recent years. In the fall of 2015, the Student Union Plaza was restored by installing a new surface on the main upper plaza and the lower area. Completed in 2013, Legacy Walk provides a scenic east-west pedestrian thoroughfare in front of the library, connecting to Hester and Monroe streets.

OSU is emerging as a leader in network computing resources. The University has applied the student technology fee in concert with other University resources to create and develop one networking system on campus that includes new computer laboratories, high speed inter-laboratory connectivity, and a virtually seamless interface to the Internet.

Lake Carl Blackwell, located eight miles west of Stillwater, is also owned by OSU along with land surrounding the lake. The area includes approximately 3,350 acres, including the 3,000-acre lake that 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 1,900 acres of farm land and facilities in Payne County, as well as 2,900 acres and various structures devoted to research stations around the state.
Institutional Diversity

Division of Institutional Diversity

Jason F. Kirksey, PhD—Vice President for Institutional Diversity
Precious Elmore-Sanders, PhD—Assistant Vice President for Institutional Diversity and Director for the Office of Multicultural Affairs
Jovette Dew, PhD—Director, Diversity Academic Support and TRIO Department
Rosalyn V. Green, PhD—Director, Office of Equal Opportunity
Tanya Lowery, PhD—Title IX Officer, Office of Equal Opportunity

Campus Address and Phone: 408 Whitehurst, Stillwater, OK 74078-1035 - 405.744.9154
Website: diversity.okstate.edu E-mail: diversity@okstate.edu

OSU Diversity Statement

Oklahoma State University is a land-grant institution committed to excellence in diversity and inclusion. We strive to maintain a welcoming and inclusive environment that appreciates and values all members of the University community. We define diversity as engagement in meaningful actions, behaviors, and conversations that reflect a commitment to recognizing, understanding, and respecting the differences among students, faculty, staff, and visitors throughout the OSU system. We do not condone acts, behavior, language, or symbols that represent or reflect intolerance or discrimination. OSU is dedicated to cultivating and enriching the competitive advantages that diversity and inclusion provide to all members of the University Community. We identify diversity as a quality of life issue, as well as an important economic driver for the prosperity and well-being of the state, nation, and world.

The Division of Institutional Diversity focuses on the development of a more inclusive community of learners and leaders while striving to address all of the complexities that emerge. We value all voices in our community. We will serve every member of the OSU family. Our goal is to maintain campus communities throughout the University system that are socially, culturally, and globally competent.

Our Mission

To develop and support efforts that help the Oklahoma State University system achieve and maintain environments where all members are actively broadening their perspectives about differences; actively seeking to know individuals; actively including all members of the community in every aspect of the organization; and where students achieve academic excellence.

Key Action Steps

• Provide seminars, workshops, courses, and other activities that afford individuals (students, staff, faculty, and community members) with opportunities to broaden their perspectives regarding differences and notions of inclusion.
• Recruit, retain, and graduate undergraduate and graduate students who actively promote the importance of an inclusively diverse community of learners and the world.
• Provide internships and service learning opportunities for students to gain knowledge and understanding of an inclusive community.
• Recruit and retain staff and faculty who actively promote the importance of an inclusive community of learners.
• Promote and reward student academic excellence.
• Serve the surrounding communities in ways that actively promote the importance of an inclusive community and world.

At Oklahoma State University, we place great value on the differences of our people. Diversity in action should empower individuals to think and act in ways that will embrace and promote a more inclusive world.

The Division of Institutional Diversity was established in 2005, and began its eleventh year with an expanded team dedicated to working as a resource across the University system. Each department or unit promotes and facilitates a more inclusive community at Oklahoma State University.

Please visit our website at diversity.okstate.edu for updates as our work continues to support the mission of this great University.

Office of Equal Opportunity

Oklahoma State University is committed to creating an environment for all students and employees that is fair and responsible - an environment where all members of the OSU community are treated with dignity and respect and distinctions are made on the basis of ability and performance. This commitment is based on our dedication to educational justice and the promise of each individual, as well as adherence to federal and state civil rights laws and University policies and procedures. It is the policy of OSU to be an equal opportunity University in all phases of operations, toward the attainment of the University’s basic mission and goals.

OSU is committed to providing equal employment and educational opportunity on the basis of merit and in a manner which does not discriminate because of an individual’s age, race, color, religion, sex, sexual orientation, genetic information, gender identity or expression, national origin, disability, protected veteran status, or other protected category. All students are provided equal educational opportunity in all phases of the academic program and in all phases of the student life programs. No known form of illegal discrimination and/or harassment will be condoned or tolerated. Procedures are in place that assures equal treatment and equal access to the facilities and educational benefits of the University for all the members of its community.

OSU also has a policy prohibiting sexual harassment of students, staff and faculty. The University subscribes to the principle of the dignity of all persons and their labors. In support of this principle, sexual harassment is condemned in the recruitment, appointment and advancement of employees and in the evaluation of students’ academic performance. OSU is committed to promoting equal opportunity in employment and education for all persons within its constituency in an environment free from sexual harassment.

Please contact the Office of Equal Opportunity, 408 Whitehurst, at 405.744.9153 for information concerning unlawful discrimination and inquiries regarding OSU compliance with equal opportunity or affirmative action, or visit the Office of Equal Opportunity website at eeo.okstate.edu.

Title IX

Title IX of the Education Amendments and Oklahoma State University policy prohibit discrimination in the provision of services or benefits offered by the University based upon gender. Gender discrimination is unequal or disadvantaged treatment of an individual or group of individuals based on gender. Sexual harassment is a form of illegal gender discrimination. Any person (student, faculty or staff) who believes that discriminatory practices have been engaged in based upon gender may discuss their concerns and file informal or formal complaints of possible violations of Title IX at, 408 Whitehurst or online at eeo.okstate.edu.

For more information refer to the OSU Gender Discrimination/Sexual Harassment Policy & Title IX Grievance Procedure 1-0702 at www.okstate.edu/osu_per/policy_proced.htm.

Office of Multicultural Affairs

The Office of Multicultural Affairs (OMA) is a place for students of different cultures, backgrounds, and experiences to come together in an effort to learn more about each other and about themselves. OMA takes a holistic approach to empower Oklahoma State University students to think and act in ways that will embrace and promote a more inclusive world. We aim to assist students in achieving academic excellence, developing their personal and professional character, and engaging in the campus and greater community. We prepare students to live and thrive in a culturally diverse world by connecting students with opportunities and resources for academic, personal and professional development.

OMA achieves these goals by offering scholarships, leadership development, cultural education opportunities and mentorship programs. We are also home to Oklahoma State’s cultural affinity groups, including the African-American Student Association, Asian-American Student Association, Hispanic Students Association, Minority Women’s Association, National Association for the Advancement of Colored People, Oklahoma State Queers and Allies, Vietnamese Student Association, and Women’s Programming Advisory Council. The OSU Native American Student Association is housed within the Center for Sovereign Nations, however, OMA also works to support the programs and activities of this student organization. OMA includes over 20 umbrella organizations.
organizations. Additional opportunities for involvement include academic seminars, cultural experiences, service learning, and social programs. For more information on OMA programs and services, visit our website at oma.okstate.edu, contact the Office of Multicultural Affairs at 240 Student Union or e-mail at oma@okstate.edu.

Diversity Academic Support
Diversity Academic Support (DAS) is a unit in the Division of Institutional Diversity with a mission to provide resources and opportunities for academic, social, and emotional growth. This unit is engaged in activities that are designed to help create a more inclusively diverse community of learners at OSU. DAS wants to work with all individuals interested in promoting this work. For more information, please contact DAS at 405.744.5335 or contact by e-mail at diversityacadsupport@okstate.edu.

ILP Program
The Inclusion Leadership Program (ILP) at OSU consists of a series of connected activities that will help OSU students and students from high schools in Oklahoma City, Tulsa, and Stillwater to (1) broaden perspectives about themselves and others; (2) develop inclusive leadership skills; (3) increase knowledge regarding global networking; and (4) clear a pathway to successful living within a global society.

The Inclusion Leadership Program is a year-long leadership program designed to equip OSU students with the skills and knowledge to become effective leaders in a more diverse and inclusive society. Students in the ILP program will share their understandings of leadership with teams of OSU sophomores and students selected from high schools in Oklahoma City, Tulsa, and Stillwater High School. The OSU and high school students will also be mentored by business leaders. By becoming mentors to the high school students, the OSU students will be passing on what they are learning. They will be developing high school students to become leaders themselves. In essence, leaders will be developing leaders.

For additional information on the ILP program, contact the coordinator at 405.744.4725.

RISE Program
The Retention Initiative for Student Excellence program (RISE) is designed to assist students in their transition from high school to Oklahoma State University. The programs primary focus is to address all of the academic issues that might challenge RISE students. The program is also attentive to the variety of social and financial challenges that RISE students often face. The RISE program provides students with mentors, scheduled study group sessions, personal and professional development preparation, opportunities to serve in leadership roles, and a number of social and cultural activities.

The objective is for all RISE students to end their first year of academic work at OSU with no less than a 3.2 GPA. The RISE program is designed for excellence. Our expectations are high and our commitment is deep. We believe that these two principles form a foundation on which RISE students will achieve excellence at Oklahoma State University and beyond. For additional information on the RISE program, contact the coordinator at 405.744.2920.

RISE Jumpstart Program
The Retention Initiative for Student Excellence (RISE) Jumpstart program is a five-week summer residential experience designed to afford incoming first-year student to Oklahoma State University opportunities to achieve a smooth transition to college life. Life skills seminars emphasizing social, emotional, physical health and wellness along with familiarity with the existing academic support networks that exist on campus will be intertwined throughout the program’s schedule. For additional information on the RISE Jumpstart program, contact the coordinator at 405.744.2920.

Student Support Services Program
The Student Services Support Program at Oklahoma State University is funded through the U.S. Department of Education. The program is designed to provide support and motivation to low-income, first-generation, and/or students with disabilities from matriculation through graduation.

The Student Support Services program provides the following services: academic advisement, financial aid advisement, mentoring, cultural programming, and service learning preparation. Students enrolled in the program may also be awarded financial assistance in the form of scholarships or stipends. For more information on this program, contact OSU-SSS at 405.744.5198.

Upward Bound
Upward Bound is a college preparatory program designed to provide academic skills and motivation for students who are interested in pursuing an educational program beyond high school. Students generally enter the program in the 9th or 10th grade and remain through graduation from high school and entry into college. During the summer, Upward Bound students live on the Oklahoma State University campus for six weeks and participate in a variety of academic, social, and cultural activities. During the regular school year, Upward Bound students are in contact with Upward Bound staff members and tutors through activities, counseling sessions and tutorials. For more information about the OSU Upward Bound Program, contact the Upward Bound Office at 405.744.5455.

Oklahoma Louis Stokes Alliance for Minority Participation
The Oklahoma Louis Stokes Alliance for Minority Participation (OK-LSAMP) program is sponsored by the National Science Foundation. The Oklahoma Alliance was formed under the leadership of Oklahoma State University and the Oklahoma State Regents for Higher Education in 1994. The program was established to address the paucity of underrepresented minority students at state higher education institutions earning degrees in science, technology, engineering and mathematics (STEM). Phase V of the program began in Fall 2014 and will continue for five years. The Oklahoma Alliance is comprised of eleven partner institutions with OSU serving as the lead institution. Alliance institutions include: The University of Oklahoma, Langston University, Cameron University, East Central University, University of Central Oklahoma, Northeastern State University, Northwestern Oklahoma State University, Southeastern Oklahoma State University, Southwestern Oklahoma State University and the University of Tulsa. For additional information visit www.ok-lsamp.okstate.edu, e-mail okamp@okstate.edu, call 405.744.6710 or 405.744.7820.
Undergraduate Admissions

Office of Undergraduate Admissions

Campus Address and Phone:
219 Student Union, Stillwater, OK 74078-1035
Phone: 405.744.5358 or 1.800.233.5019 ext. 1
Fax: 405.744.7092
Website: admissions.okstate.edu  E-mail: admissions@okstate.edu

Application Procedure

• When to Apply. Incoming freshmen may begin the application process at Oklahoma State University as soon as they have completed their junior year in high school and have an official six-semester transcript. Concurrent students must submit all concurrent application documents at least two business days before each semester they plan to enroll. Oklahoma State University’s priority scholarship deadline for students who plan to enroll in the summer or fall semester are:
  – November 1: Early Opportunity Scholarship Deadline
  – February 1: Priority Scholarship Deadline
  – July 1: Final Scholarship Deadline
The priority scholarship deadline for students planning to enroll in the spring semester is October 15.

• How to Apply. Students can apply online via the Undergraduate Admissions website or apply in person at the Office of Undergraduate Admissions. OSU requires a non-refundable application fee of $40 or application fee waiver for domestic students. Official transcripts and test scores are also required before an admission decision can be determined.

• Freshman. For the purpose of determining admission, a freshman student is one who has earned no more than six hours of college level credit after graduation from high school. (This excludes credits earned concurrently with high school enrollment and credit earned by examination).

• Concurrent. For the purpose of determining admission, a concurrent student is one who is currently enrolled in a high school junior or senior year and is interested in earning college coursework during their junior or senior year of high school.

• Transfer. For the purpose of determining admission, a transfer student is one who has earned seven or more semester hours of college-level credit after graduation from high school.

Readmission. A student who has attended OSU, but was not enrolled during the immediate past semester (except the summer session), must submit an updated Application for Admission/Placement fee or waiver. A student who has enrolled in another college or university since last attending OSU must submit an application from each institution, an updated Application for Admission/Placement/Placement fee or waiver. A returning service member whose enrollment was interrupted due to service obligations must submit an updated Application for Admission/Placement. Returning service members must submit confirmation of military service orders that necessitated absence from the university in order to receive an application fee waiver. Admission status will be determined after an evaluation of all previous work has occurred.

Freshman Admission Requirements

For purposes of admission, a freshman student is one who has earned no more than six hours of college level credit after graduation from high school. (This excludes credits earned concurrently with high school enrollment and credit earned by examination)

To be admitted in good standing a student must graduate from an accredited high school 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 of the six regional associations of schools and colleges or by the individual state department of education.)

Performance Requirements. To be admitted in good standing, a student must satisfy at least one of the following performance standards and all of the curricular requirements listed below.

1. Achieve a four-year high school unweighted GPA of 3.00 or higher (on an unweighted 4.00 grading scale; GPA is an unweighted average of all grades “A” equating to 4.00 and “D” equating to 1.00 taken 9th through 12th grades), and rank-scholastically among the top one-third (33.3%) of their graduating class, or

2. Achieve a GPA of 3.00 or higher (on a 4.00 grading scale standard weighting (1.0) to The College Board’s Advanced Placement courses and the International Baccalaureate higher-level courses) in the required 15 core high school courses (see Curricular Requirements listed below) and attain either an ACT composite score of 21 or higher or a total SAT score of 980 or higher, or SAT-R score 1060, or

3. Attain an ACT composite score of 24 or higher or a total SAT score of 1090 or higher or a total SAT-R 1160 or higher.

4. Achieve a GPA of 3.00 or higher (on a 4.00 grading scale standard weighting (1.0) to The College Board’s Advanced Placement courses and the International Baccalaureate higher-level courses) in the required 15 core high school courses OR attain either an ACT composite score of 22 or higher OR a total SAT score of 1020 or higher or a total SAT-R of 1100 and answers to the application questions.

SAT total score is the combination of Critical Reading and Math sections only. SAT-R scores indicated here represent tests taken on or after the National March 2016 test.

Curricular Requirements. All students must complete the following curricular requirements for admission:

SUBJECTS     YEARS

English (grammar, composition & literature) 4
Mathematics (algebra and above) 3
History & Citizenship (American history required, plus additional units from economics, government, history or non-western culture) 3
Laboratory Science 3
Other (from any of the above or foreign language or computer science) 2

In addition to the above requirements, it is recommended that students also complete the following additional courses:

YEARS

Fine arts (music, art, or drama) Speech 2
Lab science 1
Mathematics 1

Students who have earned any hours of college-level credit must also meet university retention standards to be admitted in good standing (see "Retention Standards" in Transfer Admission).

Curricular Deficiencies and Remediation. Students must ‘place’ into college-level course work in the areas of English, math, reading, and science through appropriate placement testing. The appropriate ACT or SAT placement test is used for placement in science courses. In addition to regular entry requirements, students must meet minimum scores on either the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) exams. Scores over two years old by the beginning of the fall semester will not be accepted unless the student has been attending school in the U.S. since the test date.

• 500 for a paper-based TOEFL or
• 61 for Internet-based TOEFL or
• 5.5 for an IELTS exam

When requesting ETS send official score reports to Oklahoma State University, please use the ETS institution code, 6546, for OSU and department code, 00.

In extraordinary and deserving cases, the President or the President’s designee may admit a student who fails to meet the above requirements. In these situations, the applicant must have demonstrated proficiency in the English language prior to admission. For further details, contact the Office of Undergraduate Admissions.

Special Freshman Admission Programs

Alternative Admission. Students whose high school achievement is below the standards specified in the performance requirements may be eligible for admission under the Alternative Admission Program. Space is limited and only those applicants showing the best promise of academic success, consistent with OSU’s enrollment goals and objectives, will be admitted.

Adult Admission. Adults 21 years of age or older or individuals on active military duty may be admitted after careful consideration is given to determine 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. To be eligible for adult admittance consideration, individuals must participate in either the ACT Assessment or the SAT admission test.

Summer Provisional Admission. Individuals not meeting requirements for admission under another category may be eligible for enrollment in the summer
Students who have not graduated from high school but whose composite score on the ACT or 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, both intellectually and socially.

Home Study or Unaccredited High Schools. An individual who is a graduate of a private, parochial, or other non-public 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 ACT composite score of 24 or higher, or a total SAT composite score of 1090 or higher, or a total SAT-R composite score of 1160 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 study courses. However, academic credit for these courses generally 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. Enrollment for this program opens two weeks prior to classes beginning.

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.
   a. Achieve a current cumulative high school grade-point average of 3.50 or higher (on an unweighted 4.00 grading scale; GPA is an unweighted average of all grades "A" equating to 4.00 and "D" equating to 1.00 taken 9th through 12th grades) or
   b. Attain an ACT composite score of 25 or higher or a total SAT score of 1130 or higher or a total SAT-R score of 1160 or higher.
   c. Be eligible to complete requirements for graduation from high school (including curricular requirements for college admission) no later than the spring of the senior year, as attested by the high school principal. Students must also provide a letter of recommendation from their counselor, principal and written permission from their parents or legal guardian.
2. A Junior student enrolled in an accredited Oklahoma high school may be admitted provisionally as a special student if he or she meets requirements 1c. above and the additional requirements listed below.
   a. Achieve a current cumulative high school grade-point average of 3.50 or higher (on an unweighted 4.00 grading scale; GPA is an unweighted average of all grades "A" equating to 4.00 and "D" equating to 1.00 taken 9th through 12th grades) or
   b. Attain an ACT composite score of 25 or higher or a total SAT score of 1130 or higher or a total SAT-R score of 1200 or higher.
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. Is 17 years of age and meets requirements 1b. and 1c. above, or
   b. Is 16 years of age and meets requirements 1c. above.

SAT total score is the combination of Critical Reading and Math sections only. SAT-R scores indicated here represent tests taken on or after the National March 2016 test.

A high school student admitted as a concurrent student 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 is equivalent to three semester credit hours of college work.

A student may enroll in a maximum of nine semester credit hours during a summer session or term at a college or university of the State System without the necessity of being concurrently enrolled in high school classes during the summer term. For purposes of calculating work load, one-half high school unit shall be equivalent to three semester credit hours of college work.

For calculation of work load for students in "blocked" courses, contact the Office of Undergraduate Admissions.

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. However, students who have earned credit in curricular areas where they have met the assessment requirements for college placement. Concurrently admitted high school students will not be allowed to enroll in any zero-level courses designed to remove high school deficiencies.

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, English, or a course in world history or the subjective respective area(s). The subject score must be higher in reading to enroll in any other collegiate course(s) outside the subjects of science, mathematics and English.

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. To continue concurrent enrollment, the student must submit an updated Concurrent Application Form to the Office of Undergraduate Admissions.

Credit by Exam. CLEP credit: Oklahoma State University Testing and Evaluation Service is a national test site for the College Board’s College Level Examination Program (CLEP). Credits earned through these examinations are normally recognized throughout the nation. Some exceptions apply to examinations that contain an essay component. National CLEP testing centers offer two kinds of examinations: general examinations and subject examinations. OSU only grants college credit for certain subject examinations.

AP Credit: OSU grants credit for acceptable scores in the Advanced Placement Program (AP) as administered by the College Entrance Examination Board in Princeton, New Jersey. AP tests are taken by high school students while in high school.

IB Credit: Oklahoma State University recognizes credit earned through the International Baccalaureate (IB) Program in a limited number of subject areas. 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.

A brochure of the CLEP, AP and IB examinations and corresponding scores accepted by OSU can be found on the Undergraduate Admissions website.

Advanced standing credit: Academic departments on campus at OSU may offer advanced standing examinations in selected areas not offered by the CLEP 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.

Military credit: OSU accepts credit as recommended by the American Council on Education (ACE), as published in "The Guide to the Evaluation of Military Experiences in the Armed Services," for selected educational experiences provided by the armed forces. OSU also accepts credit earned through DSST exams (DANTES Subject Standardized Tests) for active, veteran and dependent military personnel.

Students who wish to establish credit for military training should request and submit a JST (Joint Services Transcript) and/or a DSST Transcript to the Office of Undergraduate Admissions for evaluation.

Additional information pertaining to these examinations may be obtained from the Office of Undergraduate Admissions. See also the "University Academic Regulations" section of this Catalog.

Transfer Admission. 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 after graduation from high school. OSU does not use incomplete, GPA-neutral passing grades (e.g., “P” or “S”), remedial/developmental, repeated, forgiven credit and activity courses when determining attempted hours for transfer admission.

Transfer Admission Requirements.
1. Students who have earned between 7-23 hours of college credit must satisfy both freshman admission requirements and achieve a minimum transfer GPA of 2.25 or higher in all college-level course work attempted.
2. Students who have earned 24-59 hours of college credit must achieve a minimum transfer GPA of 2.25 or higher in all college-level course work attempted.
3. Students who have earned 60 or more hours of college credit must achieve a minimum transfer GPA of 2.00 or higher in all college-level course work attempted.

Transfer Credit Evaluation. Transfer credit evaluation in the Office of Undergraduate Admissions determines acceptable transfer credit on a course-by-course basis for college-level credit earned at institutions who are fully accredited by any of the six U.S. regional associations. The evaluation is based on course content, as described in the catalogs of those institutions and in consultation with appropriate academic units at OSU. Transcripts of record from institutions not accredited by a regional association may be accepted in transfer when the Office of Undergraduate Admissions has had an opportunity to validate the courses or programs. All transferred courses are recorded on the student’s academic record. No part of the previous collegiate record may be disregarded.
Courses completed at institutions located outside of the U.S. will be reviewed for transfer credit based on U.S. regional accreditation standards or postsecondary recognition in the country for which the institution is located. It is highly recommended that the program requirements and course syllabi be submitted for all courses completed overseas.

Readmission. A student who has attended OSU but was not enrolled during the immediate past semester (except the summer session) must file an updated Application for Admission/Scholarship and current application fee or waiver. A student who has enrolled in another college or university since last attending OSU must submit a transcript from each institution. Admission status will be determined after an evaluation of the previous work has occurred.

Additional Requirements for Admission or Continued Enrollment

Enrollment Information. After admission is granted, all students will receive detailed information on new student orientation. The fall semester enrollment period for freshmen and nondegree-seeking orientation students is conducted on campus during the summer. Parents are welcome and are encouraged to participate in the enrollment process with the student. Students are required to submit a final high school transcript which includes confirmation of high school graduation and any required test scores.

Immunization Requirements and Health History. All new students are required by Oklahoma law to provide evidence of having been immunized against measles, mumps, and rubella, (two shots), and against Hepatitis B, (three shot series). Read instructions carefully regarding the requirements to provide supporting documentation of these immunizations (copies of shot records). In addition, students are required to complete a brief medical history found on the Immunization and Health History form. This form is mailed to all new students or can be downloaded from the Internet at www.okstate.edu/UHS/. If this information is not received during the student’s first semester, a hold will be placed on future enrollment until the requirement is met.

Tuberculosis Testing. Any student who meets any of the criteria below is required to provide evidence of having been tested for Tuberculosis within the six months prior to coming to OSU, OR by the fourth week of classes:

- Hold a visa for study in the U.S.
- A U.S. born student who has reside overseas for more than eight continuous weeks.
- Have a medical condition that suppresses the immune system.
- Has been exposed to someone known to have TB disease.

To comply with this policy, the student must provide a copy of a TB skin test performed within the prior six months in the U.S., or if prior skin tests have been positive, documentation of a negative chest x-ray performed in the U.S. All records must include the dates and results of the test. Specific instructions are provided on the Immunization and Health History form. Prior vaccination with BCG does not exempt the student from this testing requirement.

Physical Examination. New students have a choice of 1.) submitting a physical examination performed in the prior six months; OR 2.) the student may complete the Health Risk Assessment provided by the Seretean Wellness Center. If students choose the physical examination option, their bursar accounts will be credited the $20 Health Risk Assessment fee.

In-State/Out-of-State Status of Enrolled Students

In-state/out-of-state status refers to whether you are an in-state Oklahoma resident or an out-of-state resident, and this classification determines your tuition cost.

Initial Classification. A student's initial In-State/Out-State classification is determined by the Office of Undergraduate Admissions when the Application for Admission/Scholarship is received.

Petition for In-State Status. A student classified as out-of-state for tuition purposes may petition for reclassification to in-state status if the student believes he/she has been incorrectly classified as out-of-state. A Petition for In-State Status form must be submitted along with any additional supporting documentation to the Office of the Registrar. The student will be notified in writing of the decision following the final review.

Deadlines for submitting petitions to be considered for reclassification in a given semester are as follows:

Fall - October 31
Spring - March 31
Summer - June 30

In-state status (and associated in-state tuition) is not granted on a retroactive basis. If you are receiving federal financial aid, please seek advice from the Office of Scholarships and Financial Aid on how a reclassification may affect your aid.

Regulations governing the in-state/out-of-state 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.

Section I. Purpose

Oklahoma statute 70 O.S., Supp. 2003, §3218.2 authorizes the State Regents to establish tuition and fees charged at public institutions to in-state/out-of-state postsecondary students. This policy statement establishes definitions, principles, criteria, and guidelines to assist institutional officials in the classification of postsecondary students as in-state/out-of-state students. Also, the policy statement should be helpful to prospective students in the determination of their in-state/out-of-state status prior to enrollment or for those out-of-state students seeking to be reclassified as in-state. Determination of in-state status for purposes of attendance at an institution in the state is based primarily on domicile as defined below. Since 1890, it has been public policy in Oklahoma to provide comprehensive, public higher education opportunities for citizens who desire to improve themselves, to upgrade the knowledge and skills of the Oklahoma work force, and to enhance the quality of life in Oklahoma generally. Therefore, residents of Oklahoma are afforded subsidies covering a portion of their educational costs at state colleges and universities. Out-of-state students are provided educational subsidies, although at lower levels than those provided for permanent in-state students. Out-of-state tuition waivers provide Oklahoma institutions the ability to attract and graduate out-of-state students with academic abilities and talents who contribute to the economic development, vitality and diversity of the state’s campuses. Additionally, Oklahoma institutions located near the state’s borders are especially sensitive to serving demographic areas where population, tax dollars, property ownership, etc., cross state borders frequently. Out-of-state tuition waivers allow institutions to serve the community and surrounding areas and attract the benefit of the institution and its students without detriment to Oklahoma residents.

Section II. Definitions

1. Dependent Person - is one who is under the care, custody, and support of a parent or legal guardian.
2. Domicile - is a person’s true, fixed, permanent home or habitation. It is the place where he or she intends to remain and to which he or she expects to return. A person can have more than one residence, but only one domicile. Domicile has two components - residence and the intent to remain. When these two occur, there is domicile.
3. Documented foreign national - is a person who was born outside the jurisdiction of the United States (U.S.), is a citizen of a foreign country, and has not become a naturalized U.S. citizen under federal law, but has entered the U.S. by way of legal documentation such as a visa.
4. Full-Time Active Duty Military Personnel - for the purposes of this policy, are members of the armed forces who are on active duty for a period of more than 30 days (means activities that do not occur on a regular military training weekend (specific period of 30 days or less). Personnel and their spouse and dependent children may be classified upon admission as in-state as long as they are continuously enrolled. ‘Armed Forces’ means Army, Navy, Air Force, Marine Corps and Coast Guard. Such term does not include full-time National Guard duty.
5. Full-time Professional Practitioner or Worker - is a U.S. Citizen or Lawful Permanent Resident who has come to Okahoma to practice a profession on a full-time basis, conduct a business full-time, or work on a full-time basis.
6. Full-Time Student - is an undergraduate student enrolled in a minimum of 12 credit hours per semester in an academic year or a minimum of six credit hours in a summer session. A full-time graduate student is one enrolled in a minimum of nine credit hours per semester or as required by the institution.
7. Independent person - is one who is responsible for his or her own care, custody and support.
8. In-state status - is a classification for a post-secondary student who has lived continuously in Oklahoma for at least 12 months not primarily as a post-secondary student, has established domicile in Oklahoma, and meets requirements associated with in-state status including sections IV, VII and VIII. Students classified upon admission as in-state are eligible to apply for state scholarships and financial aid programs.
9. Lawful permanent resident - is a naturalized alien who has been granted official immigration status as a lawful permanent resident of the U.S. This is evidenced by a lawful permanent resident card (also called a "green card").
10. Out-of-state status - means an individual does not meet in-state requirements defined in this policy unless otherwise allowed by exceptions or provisions in policy.
11. Out-of-state tuition waiver - is the portion of tuition that is waived in excess of that paid by students classified as in-state.
12. Undocumented student - is a person who was born outside the jurisdiction of the United States and has not become a naturalized U.S. citizen under U.S. law and has entered the U.S. without documentation.
13. U.S. Citizen - is a person born in the United States, a U.S. Territory or former U.S. Territory or who has been granted citizenship by the U.S. Government.

Section III. Principles

As part of the admissions process, institutions are responsible for determining students’ in-state/out-of-state status consistent with this policy. Administrators, interview students, review documentation and are in the best position to determine whether the student may be classified as in-state. Each institution must designate an appropriate administrative official (most often the Admissions Officer) as responsible for administration of this policy. The burden of proof to establish in-state status shall be upon the student. Since residence or domicile is a matter of intent, each case will be judged on its own merit by the appropriate administrative official(s) consistent with this policy. Merely asserting domicile as resident such as checking “In-State” on the application for admission is insufficient. The appropriate administrative official must review relevant documents, consider the policy principles and procedures, circumstances, and documentation to determine in-state status. Where no set criteria, documentation, or set of circumstances can be used for this purpose, the principles outlined below guide the process.

1. Attendance at a post-secondary educational institution, albeit a continuous and long-term experience, does not establish in-state status. Therefore, a student neither gains nor loses in-state status solely by such attendance.
2. Students attending an Oklahoma college or university may perform many objective acts, some of which are required by law (i.e., payment of taxes), and others which are voluntarily done by some out-of-state students who do not intend to remain in Oklahoma after graduation, but are situational and necessary and/or voluntary (i.e., registering to vote, obtaining a driver’s license). Such acts and/or declarations alone are insufficient evidence of intent to remain in Oklahoma beyond the college experience.

3. An out-of-state 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.

4. An individual is not deemed to have acquired in-state status until he or she has been in the state for at least a year primarily as a permanent resident and not primarily as a student. Likewise, an individual classified as in-state shall not be reclassified as out-of-state until 12 months after leaving Oklahoma to live in another state.

5. Unless residency has been established in another state, an individual who resided in Oklahoma at the time of graduation from an Oklahoma high school and has resided in the state with a parent or legal guardian for two years prior to graduation from high school will be eligible for in-state status as allowed in Sections VI, VII and VIII.

6. Each spouse in a family shall establish his or her own status on a separate basis. Exceptions include the following: when an out-of-state status individual marries a person in in-state status, the out-of-state individual may be considered in-state after documentation of the marriage and proof of domicile are satisfied without the 12 month domiciliary waiting period, and as allowed in Sections VII and VIII.

7. Initial classification as out-of-state shall not prejudice the right of a person to be reclassified thereafter for following semesters or terms of enrollment as in-state provided that he or she establish domicile as defined in this policy. Institutions must establish procedures for students to appeal out-of-state status classifications.

8. Institutions may, but are not required, to waive out-of-state tuition (also known as Nonresident Tuition Waiver) in accordance with current State Regents’ Tuition and Fees Policy 4.18.5.B that allows any institution in the State System to waive a portion of the out-of-state tuition which amount shall not exceed the difference between out-of-state tuition and the amount paid by in-state students.

9. When a student transfers from one institution to another, the institution to which the student transfers is not bound by the in-state/out-of-state classifications previously determined and may request documentation to determine the student’s in-state/out-of-state status.

Section IV. Dependent and Independent Persons

The legal residence of a dependent person is the postsecondary student’s parents or the residence of the parent who has legal custody or the parent with whom the student habitually resides. If the student is under the care of others other than the parents, the legal residence is that of the student’s legal guardian. In-state/out-of-state classifications of postsecondary students with extenuating circumstances (e.g., divorced parents with joint custody when one parent or legal guardian lives out-of-state and/or claims as a dependent on a tax return, etc.) may be considered on a case-by-case basis. Guidance for administrative officers charged with classifying students will be provided in the procedures manual. A dependent person may establish independent person status through circumstances including cohabitation, formal relationship, abandonment, dependent children, etc. To qualify, a dependent person must have completely separated from the parental or guardian domicile and prove that such separation is complete and permanent. Additionally, the individual must provide evidence that they are responsible for their housing and living expenses. Merely absence from the parental or guardian domicile is not proof of its complete abandonment. If an applicant can provide adequate and satisfactory evidence of independent status and domicile, they may be granted in-state status. If an independent person can provide evidence of coming to Oklahoma to establish domicile, the applicant may be granted in-state status at the next enrollment occurring after expiration of 12 months following establishment of domicile in Oklahoma.

Section V. Documented Foreign Nationals

Documented foreign nationals may attend as postsecondary students if they have appropriate educational visas. These individuals are eligible for in-state classification if they become lawful permanent residents, have resided in Oklahoma for at least 12 consecutive months, and meet domicile requirements as set forth in this policy. Documented foreign nationals who are present in the U.S. with visas that allow full-time employment for extracurricular ability in sciences, arts, education, business, athletics, as an executive, manager, or specialist of a treaty nation company operating in the U.S. are eligible for out-of-state tuition waivers as long as they remain in full-time status. Dependents of these documented foreign nationals who are lawfully present in Oklahoma based on the documented foreign nations visa are also eligible for out-of-state tuition waivers.

Section VI. Undocumented Students

In accordance with Title 70, O.S., Section 3242 (2007) (also known as HB1804 of the Regular Session of the 51st Legislative), an individual who cannot present to the institution valid documentation of United States nationality or an immigration status permitting study at a postsecondary institution but who:

1. Graduated from a public or private Oklahoma high school

2. Resided in this state with a parent or legal guardian while attending classes at an Oklahoma public or private high school in this state for at least two (2) years prior to graduation; and

3. Satisfies admission standards for the institution.

Individuals who meet the above requirements are eligible for enrollment and/or out-of-state tuition waivers if that individual:

A. Provides the institution with a copy of a true and correct application or petition filed with the United States Citizenship and Immigration Service (USCIS) to legalize the student’s immigration status, or

B. Files an affidavit with the institution stating that the student will file an application to legalize his or her immigration status at the earliest opportunity the student is eligible to do so, but in no case later than:

   i. One (1) year after the date on which the student enrolls for study at the institution, or

   ii. If there is no formal process to permit children of parents without lawful immigration status to apply for lawful status without risk of deportation, one (1) year after the date the USCIS provides such a formal process.

C. If the student files an affidavit pursuant to subsection 2. above, presents to the institution a copy of a true and correct application or petition filed with the USCIS no later than:

   i. One (1) year after the date on which the student enrolls for study at the institution, or

   ii. If there is no formal process to permit children of parents without lawful immigration status to apply for lawful status without risk of deportation, one (1) year after the date the USCIS provides such a formal process, which copy shall be maintained in the institution’s records of that student.

D. Any student who completes and provides the institution with a copy of a true and correct application or petition filed with USCIS to legalize the student’s immigration status shall not be disqualified on the basis of the student’s immigration status from any scholarships or financial aid provided by this state as long as the student:

   i. Graduated from a public or private Oklahoma high school;

   ii. Resided in this state with a parent or legal guardian while attending classes at an Oklahoma public or private high school in this state for at least two (2) years prior to graduation; and

   iii. Satisfies admission standards for the institution.

Section VII. Military Personnel

Members of the armed forces who provide evidence that they are full-time active duty in the armed forces stationed in Oklahoma or temporarily present through military orders shall be immediately classified upon admission as in-state status along with their spouse and dependent children. Further, when members of the armed forces are transferred out-of-state, the member’s spouses and dependent children shall continue to be classified as in-state as long as they remain continuously enrolled. Former full-time active military personnel who remain in Oklahoma after their service may retain their in-state status without the 12 month requirement if they establish domicile as defined in this policy.

Section VIII. Discharged or Released from Active Uniformed Service Regardless of Home of Record

In compliance with the Veterans’ Access, Choice, and Accountability Act of 2014 and Title 70, O.S. Section 3247, a student who files with the institution within the 12 month requirement at which the student intends to register a letter of intent to establish residence in the state and who resides in the state while enrolled in the institution is eligible for in-state status, regardless of the residency of the student or home of record, if the student:

1. Is a person who:

   a. Was classed as a nonmember, or released from a period of not fewer than ninety (90) days of active duty uniformed service, less than five (5) years before the date of enrollment in the course(s) concerned, and

   b. Is pursuing a course of education with educational assistance under Chapters 30 or 33 of Title 36 of the United States Code while living in Oklahoma; or

2. Is a person who:

   a. Is entitled to assistance under Section 3311(b)(9) or 3319 of Title 38 of the United States Code by virtue of a relationship to a person who was discharged or released from a period of not fewer than ninety (90) days of active duty uniformed services, and

   b. Is enrolled in the course(s) concerned within five (5) years of the date the related person was discharged or released from a period of not fewer than ninety (90) days of active duty uniformed services.

Section IX. Reserve Officer Training Corps (ROTC)

A person who is participating in or has received a full or partial scholarship from the Air Force, Army, or the Navy/Marines ROTC shall be eligible for in-state status.

Section X. Full-Time Professional Practitioner or Worker

A U.S. citizen or Lawful Permanent Resident who provide 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 immediately classified as in-state status along with his or her spouse and dependent children without the 12 month domiciliary requirement so long as they continue in such full-time employment capacity or until such time that they independently establish in-state status as described in Section III of this policy. A full-time professional practitioner or worker who is temporarily assigned to another location but maintains domicile in Oklahoma shall be considered to have in-state status along with the practitioner’s spouse and dependent children.
International Undergraduate Admissions

Office Undergraduate Admissions
Campus Address and Phone:
219 Student Union, Stillwater, OK 74078-1035
Phone: 405.744.5358 or 1.800.233.5019 ext. 1
Fax: 405.744.7092
Website: admissions.okstate.edu E-mail: admissions@okstate.edu

International students are required to meet academic performance standards which are equivalent to those established for all domestic applicants; however, freshman students educated outside the United States are not required to participate in the ACT or SAT. Participation in such tests for students educated outside the U.S. is only necessary for students wishing to qualify for scholarship opportunities. (See "Undergraduate Admissions" for the academic performance standards).

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. To apply for admission all international students must submit:

1. An application for Admission and a fee of U.S. $90.00 made payable to OSU.
2. An 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.
   a. Secondary school records (yearly mark sheets or transcripts).
   b. Records from each college of university attended (yearly mark sheets or transcripts).
   c. National examination results.
3. Applications for international students are processed on a “rolling basis” just as domestic applicants; however, students are encouraged to submit materials by the following dates to ensure adequate time for their VISA interview process:
   a. March 1 for Summer term
   b. May 15 for Fall term
   c. October 1 for Spring term
4. All new applicants for undergraduate study for whom English is a second language are required to present either a minimum paper-based score of 500, or a minimum Internet-based score of 61 on the Test of English as a Foreign Language (TOEFL), or a minimum score of 5.5 on the International English Language Testing System (IELTS), taken within the last two years.
5. Completed OSU financial guarantee form.
6. Freshman applicants educated within the United States must provide their official ACT or SAT score reports to OSU.

In extraordinary and deserving cases, the President or the President’s designee may admit a student who fails to meet the above requirements. In these situations, the applicant must have demonstrated proficiency in the English language prior to admission. For further details, contact the Office of International Students and Scholars.

Transfer Admission
For the purpose of determining admission, a transfer student is one who has earned seven or more semester hours of college-level credit.

In evaluating college-level credit for course work completed outside of the U.S., OSU requires that the institution where the credit was earned and the program of study be recognized as tertiary level through the standards set by the country where the institution is located. OSU evaluates semester credit hours and grades earned based on U.S. equivalency standards.

Immigration Issues. The U.S. Citizenship and Immigration Services (USCIS) require that international students file a statement with the University showing 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 I-20 or DS-2019. Oklahoma State University has limited financial assistance for international students.

Students should not plan to finance their education with employment at Oklahoma State University. Students who are accepted to OSU and maintain their immigration status while making appropriate progress toward their degrees may be eligible to apply for on-campus University employment for 20 hours per week. However, students should take into consideration that campus employment opportunities are limited. Students holding F-1 or J-1 visas are rarely permitted by USCIS to work outside the University, and can be deported from the United States if they are found to be in violation of this regulation.

Electronic registration of immigration records into the USCIS Student Exchange and Visitor Information System (SEVIS) is mandatory for all international students pursuing education within the United States. International students must update their records in SEVIS prior to any change in their immigration information. This includes dropping below full-time status, changing local address, transferring to another institution, changing majors, withdrawing from classes, etc.

The OSU Office of International Students and Scholars (ISS) is responsible for entering those records into SEVIS. However, it is the student’s responsibility to obtain and maintain the correct immigration status while in the U.S. Conditions that apply to F-1 and J-1 status are summarized on the I-20 or DS-2019 forms and explained in detail at the mandatory ISS International Student Orientation program. This orientation program occurs the week before classes begin each fall and spring semester. Students should make their travel plans accordingly.

The Office of International Students and Scholars, located in 001 Classroom Building, should be contacted with questions related to SEVIS or individual immigration status issues at su-iss@okstate.edu.

Mandatory Health Insurance for Non-immigrant Students
Office of International Students and Scholars
Campus Address and Phone:
250 Student Union, Stillwater, OK 74078-1035
Phone: 405.744.5459
Website: union.okstate.edu/iss/index.htm

The Oklahoma State University Board of Regents requires that nonimmigrant students be covered by health insurance.

The OSU Student Insurance Policy is the recommended health insurance and will be billed to your student account automatically.

In the following cases a waiver from this policy may be granted:

1. The insurance premium will be waived for nonimmigrant students sponsored by the United States Government, a foreign government recognized by the United States of America, or certain international, government sponsored or non-governmental organizations. Such waivers will be based on the government or organization guaranteeing payment of all health care expenses including evacuation and repatriation.
2. The insurance premium will also be waived for students who provide documented evidence of health insurance coverage by an employer. Nonimmigrant students employed by OSU and eligible for both employer-provided insurance and international student health insurance may select between the two, as long as the insurance selected includes evacuation and repatriation coverage.
3. Students covered by a recognized private medical insurance plan with benefits equal to or better than those outlined below, may request a waiver from OSU’s international student health insurance requirement. Coverage must be in effect from the first day of fall classes for a 12 month period. An alternate medical insurance plan must meet or exceed the following minimum requirements:
   • Medical benefits of at least $50,000 per accident or illness
   • Evacuation benefits of at least $7,500
   • Deductible does not exceed $500 per accident or illness
   • Repatriation of remains benefit in the amount of $10,000

To use alternate insurance, students must complete and submit a waiver request no later than the tenth day of classes. Once the waiver has been approved, a refund credit will be posted to the student’s account. Please check your student account to confirm your waiver processing status. If your waiver has been denied, you will receive an e-mail with an explanation for the denial.

If you have an appointment as an OSU Graduate, Teaching or Research Assistant or Associate, OSU provides the student health insurance policy for you. You will not be required to submit a request for waiver.

Waivers are required to be submitted by the end of the tenth day of classes. Waiver forms can be found at: union.okstate.edu/iss/ProspectiveStudents/General.htm.


**Degree Programs**

The type of degree offered in each major is listed along with the options and the college(s) in which each may be earned. For details, see appropriate department narrative. Major and option codes are included to assist in completing University forms where major and option information is required.

**College Abbreviations:**

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<td>BU</td>
<td>Spears School of Business</td>
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<td>ED</td>
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<tr>
<td>EN</td>
<td>College of Engineering, Architecture and Technology</td>
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<td>HS</td>
<td>Human Sciences</td>
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**Degree Abbreviations:**

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**Major / Option**

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- Agricultural Economics AG MS/PhD AGEC
- Agricultural Education AG MS/PhD AGED
- Animal Science AG MS/PhD ANSI
- Biochemistry and Molecular Biology AG MS/PhD BIMB
- Crop Science AG PhD CPSI
- Entomology AG PhD ENTO
- Entomology and Plant Pathology AG MS ENPP ENTO
- Food Science AG MS/PhD FDSC
- General Agriculture AG MAG AG AGBU
- Agribusiness AG MAG AG AGEC
- Agricultural Economics AG MAG AG AGED
- Agricultural Education AG MAG AG AGL
- Agricultural Leadership AG MAG AG AGLE
- Animal Science AG MAG AG ANSI
- Entomology AG MAG AG ENTO
- Horticulture AG MAG AG HORT
- International Agriculture AG MAG AG INAG
- Natural Resource Ecology and Management AG MAG AG NREM
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- Horticulture AG MS HORT
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## CENTER FOR VETERINARY HEALTH SCIENCES
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| Environmental Studies                              | AS      | UCRT | EVST|
| International Competency                           | BU      | UCRT | INTC|
| Sustainable Business Management                     | BU      | UCRT | SBM |

| Graduate Certificates:                              |         |      |     |
| Aerospace Security                                  | GR      | GCRT | ASPS|
| Big Data Analytics                                  | GR      | GCRT | BDA |
| Bioenergy and Sustainable Technology                | GR      | GCRT | BAST|
| Bioinformatics                                      | GR      | GCRT | BIOI|
| Business Data Mining                                | GR      | GCRT | BDM |
| Business Sustainability                             | GR      | GCRT | BUSS|
| College Teaching                                    | GR      | GCRT | CTCH|
| Engineering and Technology Management               | GR      | GCRT | ETM |
| Entrepreneurship                                    | GR      | GCRT | EEE |
| Family Financial Planning                           | GR      | GCRT | FFP |
| Gerontology                                         | GR      | GCRT | GERO|
| Global Issues                                       | GR      | GCRT | GLI |
| Grassland Management                                | GR      | GCRT | GRMT|
| Information Assurance                               | GR      | GCRT | IA  |
| Interdisciplinary Toxicology                        | GR      | GCRT | ITOX|
| International Disaster and Emergency Management     | GR      | GCRT | IDEM|
| Marketing Analytics                                 | GR      | GCRT | MKTA|
| Non-profit Management                               | GR      | GCRT | NPM |
| Online Teaching                                     | GR      | GCRT | OLT |
| Public Health                                       | GR      | GCRT | PH  |
| Rural and Underserved Populations                   | GR      | GCRT | PH  |
| Teaching English to Speakers of Other Languages     | GR      | GCRT | TESL|

## CENTER FOR HEALTH SCIENCES
### DOCTOR OF OSTEOPATHIC MEDICINE DEGREE PROGRAM

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## OSU GRADUATE PROGRAMS OFFERED THROUGH THE CENTER FOR HEALTH SCIENCES

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<td>ENTO</td>
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<td>Plant Pathology</td>
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</tr>
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<td>Statistics</td>
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</table>
New Student Orientation and Enrollment

Office of New Student Orientation and Enrollment
Missy Wikle, MA—Director
Campus Address and Phone:
321 Student Union, Stillwater, OK 74078
405.744.3636
Website: newstudents.okstate.edu E-mail: newstudents@okstate.edu

Orientation and Enrollment
New Student Orientation & Enrollment is a required program for all incoming freshman and transfer students. Developed to assist in the transition to Oklahoma State University, the program introduces campus resources, offices and information while familiarizing new students with the campus and Stillwater communities.

During orientation & enrollment students:
• Work with academic advisers to learn about degree program choices and discover initial tools for success at OSU.
• Enroll in classes.
• Prepare for academic transition from high school or another institution to OSU.
• Learn about life outside of the classroom and what is expected of OSU students.
• Define potential majors, careers, minors, and secondary areas of study.
• Work with an Orientation Leader and mentor who provides information from a student perspective.

New Freshmen. For freshman attending the fall semester, orientation & enrollment occurs during the months of May, June, and July. The standard summer orientation is an overnight session where students meet with academic advisers in multiple settings and have time to consider course options prior to enrollment. An alternate one day option is available for students who have attended multiple academic campus events, are certain of their degree choice and can make decisions quickly. For those attending the spring semester, orientation & enrollment occurs in December and January.

Transfer Students. Transfer students have several options for Enrollment. For transfers attending in the fall, enrollment occurs in April, May, June, and July and for those attending the spring, enrollment is November and December. Enrollment dates for transfer students are based on the number of hours completed and posted to transcript (6) prior to any current course enrollment. Pride in OSU is a huge part of being a student and campus traditions are what connect you to the campus and to students and alumni across the world. Your transition to OSU includes two additional parts.

Camp Cowboy
Camp Cowboy is a fun experience, filled with connections to other new students and OSU student leaders. Participants engage in team-building activities, small-group discussions, meet OSU athletes and coaches at the spirit session, participate in recreational activities such as swimming and volleyball, and enjoy camp fires while learning personal strengths. For students who can only travel to Stillwater once in the summer, most Camp Cowboy weekends fall immediately prior to or following New Student Orientation and Enrollment programs. Visit campcowboy.okstate.edu for more information.

Welcome Week
The Office of New Student Orientation, working in collaboration with numerous campus departments and volunteers, brings you Welcome Week, a week of programs designed to help students transition to OSU before classes begin. Students connect with other students, faculty, and staff as well as learn the OSU traditions, expectations, and resources available. Welcome Week opens with President’s Convocation, Class Photo, Traditions Night, and social activities. Visit welcomingweek.okstate.edu for more information.

Banner
Banner provides online access which allows students to view and update their academic and personal information in a self-service system. The majority of Banner use comes during descriptions, search open sections of specific courses, and drop and add classes from their schedule.

Banner also connects students to their class schedule, grades and unofficial academic transcript, Desire2Learn online classroom, personal information housed on the system, official academic transcript requests, Student Rights and Responsibilities document, official OKSTATE e-mail account, Bursar account, financial aid connections and credit card payment options.

Orange Key Account (O-KEY)
Every OSU student creates a personal O-Key account they will use to choose an okstate.edu e-mail account and access campus network and computing resources. It is very important to access and set up the O-Key account after applying for admission. To activate visit okey.okstate.edu.

ID Services
The OSU ID card is the official identification card for Oklahoma State University. It is used for photo identification, access to campus buildings and facilities, charges to the OSU Bursar, and tickets to a variety of campus events and services. OSU IDs will be made during the New Student Orientation and Enrollment program.

Placement Exams
Assessment and Testing can save both money and time by allowing students to test out or receive credit for courses in which they already know the material or for placement in a course level. Residual ACT and SAT, CLEP and Placement credit exams are administered by University Testing and Evaluation Services, located on the corner of Walnut St. and Admiral Ave. Exams are given by appointment. Visit uat.okstate.edu or call 405.744.3958 to set up an appointment.

Math Placement: All incoming OSU students must complete the OSU Math Placement Exam before enrollment in any college level mathematics course. The OSU Math Placement exam is an online instrument. For testing instructions and additional information, visit placement.okstate.edu/math or contact the Office of New Student Orientation & Enrollment at 405.744.3636

Foreign Language Placement: Students who wish to continue in a foreign language for which they have taken two or more years in high school, may take a free placement test through the Office of Foreign Languages and Literature. This exam identifies the best college level starting point. If the student completes the identified course with a minimum grade of ‘B’, additional credits may be awarded for up to ten hours in the language. Contact the Arts and Sciences Student Success Center at 405.744.5658 for additional information.

Advanced Placement and International Baccalaureate: Students requesting college credit through Advanced Placement and International Baccalaureate programs should have test scores sent directly to OSU Undergraduate Admissions from the testing agency in order to apply credits earned to their program of study.
Enrollment
No refund
No transcript record
In order to facilitate access to courses required for timely
No transcript record
Course Grade
"W"
Partial refund
the last day a course may be added (nonrestrictive). With instructor approval, a
an eight-week summer session, or proportionate periods for short courses is
Adding or Dropping Courses
Partial refund
available on the Registrar’s website (registrar.okstate.edu).

Student Enrollment
Students must be admitted to the university before they can enroll for classes. Enrollment initiates the creation of an academic record and incurs a financial obligation. (see the “Bursar” section of this Catalog).
The registration process is introduced to new freshmen and transfer students during new student orientation.
After meeting with their academic adviser to select courses appropriate to their degree plan, students enroll online via Self Service at http://my.okstate.edu. An overdue account with the University or other registration holds will prevent completion of the enrollment process until these holds have been cleared.
Continuing students register for summer and fall classes during the latter part of the preceding spring semester and for spring classes during the latter part of the preceding fall semester.
Continuous Enrollment. An undergraduate student who is enrolled for every fall and spring semester is considered continuously enrolled. A fall or spring semester with no enrollment is considered a break in enrollment. A graduate student with no break in enrollment or with a break in enrollment of less than one year is considered continuously enrolled. Readmission to the university is required if a student does not maintain continuous enrollment.
Priority Enrollment. In order to facilitate access to courses required for timely degree completion, a student’s priority for enrollment generally follows academic class level with graduate students and seniors having the highest priority. Some exceptions to this basic priority may be necessary to accommodate bona fide student needs, such as students with physical disabilities, for those committed (by a scholarship or full-time employment at the University) to perform a service for the University on a schedule specified by the University, for graduate students and students in the Honors College. Academic Affairs determines enrollment priorities, and enrollment schedules are published in the Enrollment Guide which can be found on the Office of the Registrar’s website registrar.okstate.edu each semester.
Full-time OSU staff may utilize priority enrollment to help ensure they are given an opportunity to identify classes at a time that is least disruptive to their work schedule. This benefit of priority enrollment is extended to full-time (100% FTE) regular staff members. Staff members who are employed less than full-time are not eligible for priority enrollment.
Late Enrollment. Students are allowed and encouraged to enroll well before the beginning of a given term (fall, spring, summer). Students whose initial enrollment for the term occurs on or after the first day of the term will be charged a late enrollment fee. A student is permitted to add classes after initial enrollment without a late enrollment fee during the first two weeks of a 16-week semester or through the fifth day of an eight-week summer session or during proportionate periods for block or short courses (see additional restrictions for Adding Courses below). See the “Tuition, Fees and Cost Estimates” section of the Catalog for the current late enrollment fee amount.

Adding or Dropping Courses
Adding Courses. Approval from the student’s academic adviser is required for adding a course. The sixth day of a regular semester, or the third class day of an eight-week summer session, or proportionate periods for short courses is the last day a course may be added (nonrestrictive). With instructor approval, a course may be added during the second week of classes of a regular semester, or the fourth or fifth day of an eight-week summer session (restrictive).
During the restrictive period, students must obtain their instructor’s and adviser’s signatures on a drop/add card and submit it to the Office of the Registrar in 322 Student Union to add a new course to their schedule.

Drop the Course with a Grade of “F.” If the student is found not responsible for the violation, 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 responsible for the violation, the instructor may assign an appropriate sanction, including assigning the grade “F” for the assignment/examination or “FI” for the course. (See Policy and Procedures Letter 02-0822).

A student may not drop any course in which a violation of academic integrity is pending against the student. If the student admits responsibility for a violation making a grade of “French” for the assignment/examination or “FI” for the course. (See Policy and Procedures Letter 02-0822).

Cancelling Enrollment and Withdrawing from the University. Enrollment cancellation occurs when a student drops all classes before classes begin, that is, before the applicable semester or session begins. Student requests to cancel enrollment must be received by the Office of the Registrar before the first day of classes for the term. Enrollment changes, such as cancelling enrollment or withdrawing from the University are the responsibility of the student. Failure to attend classes or nonpayment of tuition and fees does not constitute notice of cancellation.

International students need to consult with International Students and Scholars (ISS) before dropping courses or withdrawing for the semester. Under reporting regulations required by the Student and Exchange Visitor Information System (SEVIS), dropping below full-time can put a student’s visa status in jeopardy.

Procedures Letter 02-0822).

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Cancellation/Withdrawal Periods for Full-Semester (16-week) Courses

<table>
<thead>
<tr>
<th>Semester Time Period*</th>
<th>Course Grade</th>
<th>Course-Related Tuition/Fee Refund</th>
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<tbody>
<tr>
<td>Before term begins (cancellation)</td>
<td>No transcript record</td>
<td>100% refund</td>
</tr>
<tr>
<td>First 6 days</td>
<td>No transcript record</td>
<td>100% refund</td>
</tr>
<tr>
<td>Days 7-10</td>
<td>W (or F) as assigned by instructor</td>
<td>Partial refund</td>
</tr>
<tr>
<td>Weeks 3-12</td>
<td>W</td>
<td>No refund</td>
</tr>
<tr>
<td>Weeks 13-14</td>
<td>W or F as assigned by instructor</td>
<td>No refund</td>
</tr>
<tr>
<td>Weeks 15-16</td>
<td>Final grade as assigned by instructor</td>
<td>No refund</td>
</tr>
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</table>

*Summer courses, intersession courses, and other courses that do not follow the standard 16-week semester follow proportionate cancellation/withdrawal/refund periods.

Leave of Absence for Active Military Duty

Per Oklahoma State law (SB 1830), OSU offers a military leave of absence (MLOA) to students who are members of the active uniformed military services of the United States who are called to active duty. An MLOA allows a student to be absent from the University for active duty without penalty to admission status or grade point average and without loss of institutional financial aid. It also allows the student to be eligible for withdrawal from all or some classes with a full refund of tuition and fees or to be eligible for incomplete grades in classes for which he/she has successfully completed at least 50% of the coursework at the time of leave, if the student intends to complete the classes upon return from active duty. MLOAs shall not exceed a cumulative five years. Graduate student LOAs are for a period of one year with annual extensions possible up to the five-year cumulative limit. Students apply for MLOA by submitting the appropriate form and supporting documentation. See OSU Military Leave of Absence FAQs on the Registrar website (registrar.okstate.edu) for more information.

Veteran Benefit Services

Oklahoma State University maintains a full-time office of veteran benefit services for the convenience of veterans and their dependents. OSU offers courses which are approved for students to receive education benefits by the Department of Veteran Affairs (DVA). Information and assistance is available for completion of appropriate forms necessary to apply for education benefits. The DVA has specific requirements regarding course work and attendance; contact a veteran’s representative in the Office of the Registrar, 322 Student Union, for more information.

Faculty and Staff Enrollment in University Courses

Faculty. Permanent (tenure track), full-time (100%) members of the faculty are eligible to enroll for credit in one course per semester or a maximum of five hours during normally scheduled working hours and receive discounted tuition and fees as indicated below. To be eligible for the faculty/staff fee waiver, an employee must submit a completed Faculty-Staff Tuition and Fee Waiver Request form to the Office of the Registrar prior to the beginning of classes. Enrollment does not exceed one course or five credit hours, only the department head’s approval is needed to receive a fee waiver. If the employee is enrolled in more than one course or five credit hours, only the department head’s approval is needed to receive a fee waiver. If the employee is enrolled in more than one course or five credit hours, his or her dean and vice president must also give approval for the fee waiver.

For active status 100% FTE, continuous regular staff enrolled in University courses, the following fees will be waived:

a. Student Activity fees
b. Student Activity fee - Athletic fee
c. Health Services fee
d. Transit/Parking Services fee
e. Student Development fee
f. Daily O’Collegian fee

Staff members must pay 50% of the general tuition, 100% of any additional fees not listed above, as well as 100% of any special course charges. Some courses taught through extension, outreach and year-long independent study are excluded. For staff members who enroll in NOC-Stillwater courses, the fees listed above may be waived, but no tuition is waived. For more information contact the department offering the course to determine whether the tuition waiver applies. For more information, refer to the Policy and Procedures Letter 2-0108.

Administrative/Professional and Classified Staff. Permanent, full-time (100%) active status staff members who meet the academic requirements of the University are eligible to enroll for credit and receive discounted tuition and fees as indicated below. To be eligible for the faculty/staff fee waiver, an employee must submit a completed Faculty-Staff Tuition and Fee Waiver Request form to the Office of the Registrar prior to the beginning of classes. Enrollment in University courses which meet during the staff member’s normal working hours will be limited to one course or a maximum of five hours. There is no limit on the number of courses a staff member may enroll in after normal working hours. If enrollment does not exceed one course or five credit hours, only the department head’s approval is needed to receive a fee waiver. If the staff member is enrolled in more than one course or five credit hours, his or her department head must also give approval for a fee waiver.

For active status 100% FTE, continuous regular staff enrolled in University courses, the following fees will be waived:

a. Student Activity fees
b. Student Activity Fee - Athletic Fee
c. Health Services fee
d. Transit/Parking Services fee
e. Student Development fee
f. Daily O’Collegian fee

Official Records

Six Week Progress Reports

Faculty report six week progress grades for all students (regardless of classification) enrolled in 1000- and 2000-level classes. This will normally occur during the seventh week of classes. Student athletes will have all six week grades reported, not just 1000- and 2000-level. Progress reports are made available to students and to the students’ advisers through Self Service.

Grade Reports

Final grades for all students are compiled and released shortly after the end of each semester by the Office of the Registrar. Final grades are made available electronically to students, students’ advisers and students’ deans through Self Service.

Official Transcripts

All official transcripts of student academic records at OSU are prepared and released by the Office of the Registrar. The official transcript includes the complete academic record (undergraduate, graduate and professional) as well as the signature of the University Registrar and the official seal of the University. Transcripts of academic records at OSU may be ordered in the following ways:

1. Online via Self Service.
2. Mail or fax a completed, signed Transcript Request form to the Office of the Registrar (forms can be downloaded from registrar.okstate.edu).
3. In person at the Office of the Registrar, 322 Student Union; with a photo ID. Students with transcript holds (such as holds due to outstanding financial obligations to the University) will not be granted an official transcript until the hold has been cleared with the appropriate University officials. Copies of transcripts from other institutions cannot be furnished.

Students’ Rights to Privacy

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

An OSU student has the right to:

1. Inspect and review information contained in his or her educational records within 45 days of the day that the University receives a written request from the student.
2. Challenge the contents of the educational record.
3. Have a hearing if the outcome of a challenge is unsatisfactory.
4. Submit an explanatory statement for inclusion in the educational record, if the outcome of the hearing is unsatisfactory.
5. Secure a copy of the institutional policy, which includes the location of all educational records.

6. Prevent disclosure, with certain exceptions, of personally identifiable information from the educational record.

7. File a complaint with the U.S. Department of Education concerning alleged failures by the University to comply with the requirements of FERPA. The name and address of the office that administers FERPA is: Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue, SW, Washington, D.C. 20202-5901.

**Definitions.**

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

"Directory Information" includes: student's name; local and permanent address or hometown; telephone number; year of birth; major field of study; weight and height of student participating in officially recognized sports; dates of attendance at Oklahoma State University; degrees, honors, and awards granted or received and dates granted or received; academic classification such as freshman, sophomore, junior, senior, etc.; institutional electronic mail address; most recent educational institution previously attended; dissertation or thesis title; adviser or thesis/dissertation adviser; participation in officially recognized organizations, activities, and sports; parents' names and addresses (city and state only).

"School official" is defined as an individual currently serving as a member of any school officials who have a "legitimate educational interest" if a review of a student's record is necessary to fulfill the official's professional responsibilities to the University. School officials may have legitimate educational interests both in students who are currently enrolled and in those no longer enrolled.

**Access to Records.** Students may inspect and review their educational records by making a written request to the office that maintains the records (see Location of Records below). No non-directory information regarding students' educational records may be disclosed to anyone without written consent of students, except for selected purposes as authorized by federal law, such as:

1. To "school officials" who have a "legitimate educational interest" in the student.
2. Upon request to another institution to which a student seeks or intends to enroll or is already enrolled if the disclosure is related to the student’s enrollment or transfer.
3. In response to a lawfully issued court order or subpoena.
4. In connection with financial aid if the information is necessary to determine aid eligibility or to enforce the conditions of the aid.
5. To accrediting organizations to carry out their accrediting functions.
6. To organizations conducting studies for or on behalf of the school in order to develop, validate, or administer predictive tests, administer student aid programs, or improve instruction.
7. To authorized representatives of the U.S. Comptroller General, the U.S. Attorney General, the U.S. Secretary of Education, and to State and local educational authorities in connection with an audit or evaluation of an education program or for compliance with Federal legal requirements related to those programs.
8. To appropriate officials in connection with a health or safety emergency.
9. Final results of certain disciplinary proceedings related to an alleged perpetrator of a crime of violence or a non-forcible sex offense.
10. To parents of a student regarding the student’s violation of any Federal, State, or local law or of any rule or policy of the school governing the use or possession of alcohol or a controlled substance if the school determines the student committed a disciplinary violation and the student is under the age of 21.

**Parental Access to Records.** At the postsecondary level, parents have no inherent rights to inspect their son's or daughter's educational records. Information regarding educational records is best obtained by direct communication between the parent and the student. Students may consent to release their educational records to parents, legal guardians, or other individuals by providing access using the Proxy feature in Self Service or completing the appropriate form in the Office of the Registrar. Such consent should be given in an uncoercive environment. Parents of a dependent student may challenge denial of access to educational records by producing the most current copy of Internal Revenue Form 1040.

**Withholding Disclosure of Information.** Currently enrolled students may withhold disclosure of directory information. A student may file a written request with the Office of the Registrar to not release personally identifiable information, including directory information. Such requests will be honored until revoked by the student. The University assumes that failure on the part of any student to specifically request the withholding of directory information indicates individual approval for disclosure.

**Location of Records.** Several offices share responsibility for maintaining and releasing information pertaining to student education records. These include, but are not restricted to: a) the Office of the Registrar for academic records, b) the Office of the Student Judicial Affairs for disciplinary records, c) the Office of the Bursar for billing and payment records, d) the Office of Scholarships and Financial Aid for scholarship and financial aid records, e) the Human Resources office and Career Services office for employment/placement records, and f) the Communications Service office for directory information.
Scholarships and Financial Aid

Office of Scholarships and Financial Aid
Chad Blew—Director
Julie Berg—Associate Director
Matt Short—Associate Director
Cathy Bird—Assistant Director, Loan Processing and Records Management
Rob Lofton—Assistant Director, Scholarships
Linda Good—Assistant Director, Client Services
Margaret Betts—Assistant Director, Special Programs
Nathan Scales—Assistant Director, Fiscal Operations

Campus Address and Phone:
119 Student Union, Stillwater, OK 74078-5061
405.744.6604 FAX 405.744.6438
Website: financialaid.okstate.edu E-mail: fmaind@okstate.edu

Students who need financial assistance to attend college are encouraged to consider the many types of financial aid available through the OSU Office of Scholarships and Financial Aid. These programs include scholarships, grants, loans, and part-time jobs. More than 80 percent of all OSU students receive some type of financial assistance to fund their education.

Scholarship Programs
Oklahoma State University annually offers more than $70 million in tuition scholarships and more than $39 million in other scholarships to qualifying freshman, transfer, continuing and graduate students. In addition to the scholarships discussed here, students are encouraged to contact community and/or tribal agencies, as appropriate, to inquire about non-OSU scholarships.

OSU’s scholarships are awarded on the basis of academic achievement, academic potential, leadership activities, or community service, and many consider financial need. Scholarships are funded by various campus academic and administrative offices, the OSU Foundation, or in conjunction with private industry, private foundations, the Oklahoma State Regents for Higher Education (OSRHE) and the state of Oklahoma.

Selected state programs, such as the OSRHE Academic Scholars Program, accept scores recorded on national test dates only. The OSU scholarship program accepts both national test scores and residual tests taken at OSU. State and University agencies may establish a cap on total scholarship dollars a student may receive from state and University sources, precluding students from receiving funds that exceed legitimate educational costs. The Undergraduate Application for Admission and Scholarships serves as the scholarship application for all new undergraduate students. Scholarships for continuing undergraduate students are awarded based on academic performance, financial need, or both. Continuing undergraduate students should also check with their academic college and departments regarding application procedures and deadlines.

Graduate students seeking cash or tuition scholarships should contact their academic departments and the Graduate College regarding application procedures and deadlines.

Tuition Scholarships
Tuition scholarships are awarded to both in-state and out-of-state students, and they vary in value and length. Tuition scholarships for Oklahoma residents are awarded to incoming freshman students who have attained high scholastic standing in high school. Tuition scholarships for nonresident students are awarded based on several criteria, including academic accomplishments or being a child or grandchild of an OSU alumnus. Students receiving a nonresident tuition scholarship have some or all of their nonresident tuition charges waived and pay in-state tuition rates and the remainder of any nonresident tuition not covered by this scholarship.

Transfer tuition scholarships are offered to outstanding students transferring to OSU from two-year and four-year colleges.

The tuition scholarship priority deadline for students entering OSU in fall is February 1st; the final deadline is July 1. The final deadline for students entering OSU in the spring is the Friday before the spring semester begins.

A student may receive only one tuition scholarship at a time. However, students may receive multiple cash awards such as the President’s Distinguished Scholarship (PDS), President’s Leadership Council (PLC) scholarship, or college and departmental awards. Each student with a multiple-year scholarship is required to meet specific renewal criteria to continue receiving his or her scholarship the following year (up to a specified maximum number of years of eligibility).

Cash Scholarships
A variety of cash scholarships are offered to OSU students at all levels of study. Funding for these awards comes from several sources, including the OSU Foundation, the Oklahoma State Regents for Higher Education, OSU academic colleges and departments, and private sources. Undergraduate students can find more information about OSU and non-OSU cash scholarships in the Office of Scholarships and Financial Aid, 119 Student Union, or online at financialaid.okstate.edu. Graduate students can find more information by contacting the OSU Graduate College.

Federal/State Aid Programs
Federal aid at OSU is awarded on the basis of demonstrated financial need. Each student who wishes to be considered for need-based assistance should submit the Free Application for Federal Student Aid (FAFSA) as soon after January 1 as possible to receive aid for the succeeding academic year.

Early application is encouraged since OSU receives limited funding for the Supplemental Educational Opportunity Grant (SEOG), Federal Work-Study (FWS) and Perkins Loan programs. Funding for state grants, including the Oklahoma Tuition Aid Grant (OTAG), is limited and earliest applicants receive priority for funds.

Students can apply for assistance by submitting the FAFSA electronically at www.fafsa.ed.gov. 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, Federal Direct Loans, Federal Work-Study (FWS), and tuition scholarships.

There are also programs available for students who do not demonstrate financial need. The Federal Direct Parent (PLUS) Loan Program, the Federal Direct Unsubsidized Loan Program, and the Federal Direct Graduate PLUS Loan allow students and parents of dependent undergraduates, to borrow funds to meet educational expenses. To be considered for financial aid, a student must:

1. Demonstrate financial need, except for some loan and scholarship programs.
2. Be a U.S. citizen or eligible non-citizen.
3. Be enrolled as a degree-seeking candidate, including a program of study abroad or be pursuing a graduate certificate approved for financial aid eligibility by the U.S. Department of Education.
4. Meet minimum satisfactory academic progress standards.
5. Have a high school diploma or GED.
6. Not be in default on any federal loan, not have borrowed in excess of the allowable limits and not owe a refund to any federal grant program (including the Oklahoma Tuition Aid Grant program).
7. Be prompt in responding to any requests for additional information made by the Office of Scholarships and Financial Aid.

Students and parents are encouraged to contact the Office of Scholarships and Financial Aid for information regarding financial assistance programs or to make an appointment with a financial aid counselor to discuss specific eligibility requirements. The office has information about programs and services online at financialaid.okstate.edu.

Grants
Undergraduate students who have not completed their first bachelor’s degree are eligible to be considered for the Federal Pell Grant and the Federal Supplemental Education Opportunity Grant. Undergraduate students who are Oklahoma residents are considered for the Oklahoma Tuition Aid Grant (OTAG). Federal Pell Grant eligibility is determined by the U.S. Department of Education by using a congressionally-approved formula.

Federal Supplemental Education Opportunity Grants (SEOG) are awarded to students who demonstrate financial need as reflected in the FAFSA. Federal Pell Grant eligibility is determined by the U.S. Department of Education by using a congressionally-approved formula.

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2. Be a U.S. citizen or eligible non-citizen.
3. Be enrolled as a degree-seeking candidate, including a program of study abroad or be pursuing a graduate certificate approved for financial aid eligibility by the U.S. Department of Education.
4. Meet minimum satisfactory academic progress standards.
5. Have a high school diploma or GED.
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1. Demonstrate financial need, except for some loan and scholarship programs.
2. Be a U.S. citizen or eligible non-citizen.
3. Be enrolled as a degree-seeking candidate, including a program of study abroad or be pursuing a graduate certificate approved for financial aid eligibility by the U.S. Department of Education.
4. Meet minimum satisfactory academic progress standards.
5. Have a high school diploma or GED.
6. Not be in default on any federal loan, not have borrowed in excess of the allowable limits and not owe a refund to any federal grant program (including the Oklahoma Tuition Aid Grant program).
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Students and parents are encouraged to contact the Office of Scholarships and Financial Aid for information regarding financial assistance programs or to make an appointment with a financial aid counselor to discuss specific eligibility requirements. The office has information about programs and services online at financialaid.okstate.edu.

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

Federal Supplemental Education Opportunity Grants (SEOG) 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.

Undergraduate, post-baccalaureate, and graduate students who are or who will be taking course work necessary to become elementary or secondary teachers may be eligible for the federal Teacher Education Assistance for College and Higher Education (TEACH) Grant. A recipient must sign the Agreement to Serve (ATS) in order for she or he will teach full-time in a designated teacher shortage area for four complete years (within eight years of completing the academic program) at an elementary or secondary school serving children from low income families. If the student fails to carry out the service obligation, the TEACH Grant must be
Scholarships and Financial Aid

The Oklahoma Tuition Aid Grant (OTAG) is awarded to eligible undergraduate 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.

Federal Work-Study
The Federal Work-Study (FWS) program is designed to help students meet their educational expenses through part-time employment. The Office of Scholarships and 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 approved off-campus, non-profit agency.

Loans
OSU has several loan programs 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 that 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 must be made in person at the Office of Scholarships and 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. Interest rates for the Federal Direct Loan programs are set annually by the federal government.

Enrollment Requirements
To be considered for loan funds, undergraduates must be enrolled in at least six hours in the fall, spring or summer semester. Undergraduates who plan to enroll in fewer than six hours for the semester may still be eligible for limited grant funding. Undergraduate tuition scholarship recipients must be enrolled in at least 12 OSU hours to receive the award for the fall or spring semester; tuition scholarships are not available for the summer. Scholarship recipients should review their award information to determine whether additional hours of enrollment are required to retain the scholarship for the following year.

Graduate students must be enrolled in at least four hours in the fall or spring semester and at least two hours in the summer to be considered for financial assistance for that semester. Graduate students receiving tuition scholarships from their academic departments or the Graduate College should contact the awarding office for enrollment requirements.

Federal and institutional aid recipients who are unsure of their eligibility for assistance based on their enrollment status are encouraged to contact the Office of Scholarships and Financial Aid for clarification. Recipients of non-OSU scholarships should check with the awarding agency to determine the minimum enrollment requirements.

Eligibility for financial assistance is related only to the total number of credit hours in which the student enrolls. Certifiable enrollment status, based upon a combination of enrollment and employment (such as a graduate assistant or student employee), is necessary to maintain eligibility for funds.

Academic Progress
The OSU Office of Scholarships and Financial Aid is required by federal regulation to monitor the academic progress of all students who apply for financial assistance. The official record of the OSU Office of the Registrar is reviewed to determine student compliance with the policy.

The policy for federal aid and state (OTAG) recipients includes three components. Students must: (1) not exceed a maximum number of hours allowed for completion of the degree program; (2) maintain a minimum cumulative Graduation/Retention Grade Point Average; and (3) maintain a satisfactory pace toward program completion, defined as successful completion of at least 67% of the total cumulative hours attempted. A copy of the policy detailing the requirements is included with every award notice and is also available in the Office of Scholarships and Financial Aid online at financialaid.okstate.edu.

Each undergraduate with a multiple-year scholarship is required to meet specific renewal criteria to continue receiving his or her scholarship the following year; the policy for each scholarship is included with the award letter and is available from the OSU Office of Scholarships and Financial Aid.

Recipients of athletic grant-in-aid must meet the eligibility requirements of the program.

Professional Education Certification
To receive financial assistance, students who are classified by the Graduate College as non-degree students and who are pursuing Professional Education certification must be enrolled in a required program for elementary or secondary teacher certification or recertification in Oklahoma (must be required to teach); and be enrolled in at least six hours each term of enrollment.

Professional Education students are eligible to apply for consideration in Federal Work-Study, Federal Perkins Loan, and Direct Loans (Subsidized and Unsubsidized). Due to the unique nature of the Professional Education program, students are encouraged to schedule an appointment with a financial aid counselor to discuss the required documentation needed for financial aid eligibility.

Approved Graduate Certificates
Students who are pursuing a graduate certificate approved for financial aid eligibility by the U.S. Department of Education are eligible for the same aid programs as graduate students pursuing master’s, doctorate, or professional degrees at OSU. A listing of approved Graduate Certificates can be found at http://gradcollege.okstate.edu/content/graduate-certificates.

Prerequisite Course Work for Admission to a Graduate Program
To be considered for federal assistance, students generally must be enrolled in a recognized academic program leading to a degree or certificate. However, if a student is enrolled at least half-time in course work that is required for admission to a graduate program at OSU, the student may be eligible for loan consideration for one calendar year (12 months) beginning on the first day of the loan period.

Students are only eligible for Ford Federal Direct Loan consideration. Preparatory students who wish to be considered for assistance should schedule an appointment with a financial aid counselor to discuss their particular circumstances.

Return to Title IV Funds Policy
The OSU Office of Scholarships and Financial Aid, in accordance with federal regulations, calculates the return of Title IV Funds for any student who receives Title IV aid and subsequently withdraws before the end of the enrollment period/term. The full policy, including official and unofficial withdrawals, aid considered in the calculation, institutional charges, attendance and earned/unearned percentage, unearned aid by the institution, unearned aid by the student, post-withdrawal disbursement, and notification of the results of the calculation, can be found on the web at financialaid.okstate.edu.
## Tuition, Fees and Cost Estimates

### Tuition and Fees

It is important that students carefully consider the total cost of financing their education, from the entering term to the completion of their 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 positions, 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 Obligation" in the “Bursar” section of this Catalog.)

The required tuition and mandatory fees for resident and nonresident students at Oklahoma State University are listed to the right. Resident and nonresident tuition rates are based on the undergraduate and graduate level of the course. All course offerings are listed by four-digit numbers with the first digit indicating the course level. Undergraduate courses are all courses with a first digit of 0 through 4. Graduate-division courses are all courses with the first digit 5 or above.

New freshmen who are Oklahoma residents are given the opportunity at the time of enrollment to select a guaranteed tuition rate that is locked in for four years. To maintain this rate, students must remain continuously enrolled as full-time students. The lock tuition rate is included in the undergraduate tuition and mandatory fees grid and detailed information is provided on the Office of the Bursar website at bursar.okstate.edu/lock-tuition-program.

For the most recent student costs refer to the Office of the Bursar website at bursar.okstate.edu/tuition.html. Included in this section is information regarding fee definitions, refund policies, and residential life rates.

Tuition and fees are subject to change without notice, as provided by the University Board of Regents and OSRHE policies.

Starting fall 2014, OSU implemented a new block rate that includes tuition and University-wide fees for undergraduate students taking 12 to 18 credit hours. The "block" rate is one of OSU’s strategies to help students stay on track to finish college in 4 years. University-wide fees (also called mandatory fees) include: student activity fees, student fee, library automation and technology fee, health services fee, student development fee, Daily O'Collegian fee, academic records and maintenance fee, academic excellence fee, transit/parking services fee, advising/assessment fee, university technology infrastructure maintenance fee, academic facilities, life safety and security fee and student union renovation fee. Academic Service Fees such as specific course fees and/or college based fees are not included in the block rate and continue to be charged on a per-credit-hour basis. Additional block rate information is available at: blockrate.okstate.edu.

### Estimated Total Expenses for Students

An estimated semester budget (based on 2016-2017 figures) for an undergraduate student at OSU is as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Resident</th>
<th>Non Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and Fees (based on 15 credit hours)</td>
<td>$4,760</td>
<td>$11,825</td>
</tr>
<tr>
<td>University Housing and Meals</td>
<td>$4,420</td>
<td>$4,420</td>
</tr>
<tr>
<td>Textbooks and Supplies</td>
<td>$830</td>
<td>$630</td>
</tr>
<tr>
<td>Average Miscellaneous Personal Expenses</td>
<td>$2,325</td>
<td>$2,325</td>
</tr>
<tr>
<td>Total per Semester</td>
<td>$12,135</td>
<td>$19,200</td>
</tr>
</tbody>
</table>

### Undergraduate Tuition and University-Wide (Mandatory) Fees (12-18 credit hours per fall or spring semester)

<table>
<thead>
<tr>
<th>Category</th>
<th>Resident</th>
<th>Non Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and University-Wide</td>
<td>$4,160.25</td>
<td>$11,221.50</td>
</tr>
<tr>
<td>Academic facility fee (per credit hour)</td>
<td>$20.15</td>
<td>$20.15</td>
</tr>
<tr>
<td>Academic Records and Maintenance fee</td>
<td>$4.35</td>
<td>$4.35</td>
</tr>
<tr>
<td>Advising/Assessment fee</td>
<td>$8.90</td>
<td>$8.90</td>
</tr>
<tr>
<td>Health Services fee</td>
<td>$0.30</td>
<td>$0.30</td>
</tr>
<tr>
<td>Student Facility fee, General</td>
<td>$5.45</td>
<td>$5.45</td>
</tr>
<tr>
<td>Student Facility fee, Campus Rec</td>
<td>$3.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Health Services fee</td>
<td>$5.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Library Automation and Technology fee</td>
<td>$17.00</td>
<td>$17.00</td>
</tr>
<tr>
<td>Life Safety and Security fee</td>
<td>$5.55</td>
<td>$5.55</td>
</tr>
<tr>
<td>Student Activity fee - Athletic fee</td>
<td>$2.50</td>
<td>$2.50</td>
</tr>
<tr>
<td>Student Facility fee, General</td>
<td>$5.50</td>
<td>$5.50</td>
</tr>
<tr>
<td>Student Activity fee</td>
<td>$2.05</td>
<td>$2.05</td>
</tr>
<tr>
<td>Student Development fee</td>
<td>$2.50</td>
<td>$2.50</td>
</tr>
<tr>
<td>Transit/Parking Services fee</td>
<td>$10.15</td>
<td>$10.15</td>
</tr>
<tr>
<td>University Technology and Infrastructure Maintenance fee</td>
<td>$15.50</td>
<td>$15.50</td>
</tr>
<tr>
<td>Academic Excellence fee</td>
<td>$4.70</td>
<td>$4.70</td>
</tr>
</tbody>
</table>

### Graduate Tuition and University-Wide (Mandatory) Fees (per credit hour)

<table>
<thead>
<tr>
<th>Category</th>
<th>Resident</th>
<th>Non Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and University-Wide</td>
<td>$209.70</td>
<td>$825.05</td>
</tr>
<tr>
<td>Academic facility fee (per credit hour)</td>
<td>$20.15</td>
<td>$20.15</td>
</tr>
<tr>
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<td>$4.35</td>
<td>$4.35</td>
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</tr>
<tr>
<td>Student Activity fee</td>
<td>$2.50</td>
<td>$2.50</td>
</tr>
<tr>
<td>Student Facility fee, General</td>
<td>$5.50</td>
<td>$5.50</td>
</tr>
<tr>
<td>Student Activity fee - Athletic fee</td>
<td>$2.05</td>
<td>$2.05</td>
</tr>
<tr>
<td>Student Development fee</td>
<td>$2.50</td>
<td>$2.50</td>
</tr>
<tr>
<td>Transit/Parking Services fee</td>
<td>$10.15</td>
<td>$10.15</td>
</tr>
<tr>
<td>University Technology and Infrastructure Maintenance fee</td>
<td>$15.50</td>
<td>$15.50</td>
</tr>
<tr>
<td>Academic Excellence fee</td>
<td>$4.70</td>
<td>$4.70</td>
</tr>
</tbody>
</table>
Center for Health Sciences Professional Programs (2016-2017 academic year)

<table>
<thead>
<tr>
<th>Fee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oklahoma Residents</td>
<td>$33,976.75</td>
</tr>
<tr>
<td>Resident tuition per year</td>
<td>$185.22</td>
</tr>
<tr>
<td>Activity fee per year</td>
<td>$108.00</td>
</tr>
<tr>
<td>Health Service fee per year</td>
<td>$161.26</td>
</tr>
<tr>
<td>Technology fee per year</td>
<td>$125.00</td>
</tr>
<tr>
<td>Malpractice Insurance</td>
<td>$120.00</td>
</tr>
<tr>
<td>Library Automation &amp; Materials fee</td>
<td>$250.00</td>
</tr>
<tr>
<td>Non-Residents of Oklahoma</td>
<td>$47,767.58</td>
</tr>
<tr>
<td>Non-Resident tuition per year</td>
<td>$185.22</td>
</tr>
<tr>
<td>Activity fee per year</td>
<td>$108.00</td>
</tr>
<tr>
<td>Health Service fee per year</td>
<td>$161.26</td>
</tr>
<tr>
<td>Technology fee per year</td>
<td>$125.00</td>
</tr>
<tr>
<td>Malpractice Insurance</td>
<td>$120.00</td>
</tr>
<tr>
<td>Library Automation &amp; Materials fee</td>
<td>$250.00</td>
</tr>
</tbody>
</table>

Center for Veterinary Health Sciences (2016-2017 academic year)

<table>
<thead>
<tr>
<th>Fee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oklahoma Residents</td>
<td>$8,745.00</td>
</tr>
<tr>
<td>Resident tuition per semester</td>
<td>$4.35</td>
</tr>
<tr>
<td>Academic Records and Maintenance fee</td>
<td>$0.30</td>
</tr>
<tr>
<td>Daily O’Collegian fee</td>
<td>$3.45</td>
</tr>
<tr>
<td>Student Facility fee, General</td>
<td>$3.00</td>
</tr>
<tr>
<td>Student Facility fee, Campus Rec</td>
<td>$5.00</td>
</tr>
<tr>
<td>Health Service fee per year</td>
<td>$7.80</td>
</tr>
<tr>
<td>Library Automation and Technology fee</td>
<td>$2.50</td>
</tr>
<tr>
<td>Student Activity fee</td>
<td>$5.50</td>
</tr>
<tr>
<td>Student Activity fee - Athlete health fee</td>
<td>$1.90</td>
</tr>
<tr>
<td>Student Development fee</td>
<td>$2.50</td>
</tr>
<tr>
<td>Transit/Parking Services fee</td>
<td>$5.00</td>
</tr>
<tr>
<td>University Technology &amp; Infrastructure Maintenance fee</td>
<td>$15.00</td>
</tr>
<tr>
<td>CVHS Technology fee</td>
<td>$8.90</td>
</tr>
<tr>
<td>Advising &amp; Assessment fee</td>
<td>$8.00</td>
</tr>
<tr>
<td>Academic Facilities Fee - CVHS</td>
<td></td>
</tr>
<tr>
<td>Non-Residents of Oklahoma</td>
<td>$21,298.00</td>
</tr>
<tr>
<td>Non-Resident tuition per semester</td>
<td>$4.35</td>
</tr>
<tr>
<td>Daily O’Collegian fee</td>
<td>$0.30</td>
</tr>
<tr>
<td>Student Facility fee, General</td>
<td>$3.45</td>
</tr>
<tr>
<td>Student Facility fee, Campus Rec</td>
<td>$3.00</td>
</tr>
<tr>
<td>Health Service fee per year</td>
<td>$5.00</td>
</tr>
<tr>
<td>Library Automation and Technology fee</td>
<td>$7.80</td>
</tr>
<tr>
<td>Student Activity fee</td>
<td>$2.50</td>
</tr>
<tr>
<td>Student Activity fee - Athletic health fee</td>
<td>$5.50</td>
</tr>
<tr>
<td>Student Development fee</td>
<td>$1.90</td>
</tr>
<tr>
<td>Transit/Parking Services fee</td>
<td>$2.50</td>
</tr>
<tr>
<td>University Technology &amp; Infrastructure Maintenance fee</td>
<td>$5.00</td>
</tr>
<tr>
<td>CVHS Technology fee</td>
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</tr>
<tr>
<td>Advising &amp; Assessment fee</td>
<td>$8.90</td>
</tr>
<tr>
<td>Academic Facilities Fee - CVHS</td>
<td>$8.00</td>
</tr>
</tbody>
</table>

Center for Veterinary Health Sciences students who repeat course work will be charged an amount per credit hour for Oklahoma residents and nonresidents. Nonresidents will also be charged nonresident tuition per credit hour.

Mandatory Fees for Special Services

All students pay special fees each semester to contribute to the betterment and general welfare of the campus community.

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.

The activity fees provide 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.

The academic facilities fee funds renovation, maintenance, operations, and construction of classroom and other academic facilities necessary to support contemporary instruction and the demands of growing enrollment.

The academic excellence fee provides for new faculty positions and/or helps increase existing faculty salaries up to peer averages.

The academic records and maintenance fee provides for the basic graduation cost, the maintenance of the academic record system and issuance of official transcripts.

The advising and 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. This fee also supports the commitment to academic advising within each college to create a collaborative decision-making framework which students can identify and realize their educational goals. The goal is to preserve personalized advising services, reduce the adviser/student ratio in high demand areas and to develop advising technology such as degree audit systems to support an increased graduation rate. Support is also provided to students with career development, employment and internship services, including expanded interview opportunities, placement preparation, and other programs related to success after graduation.

The health services fee is assessed for comprehensive health and pharmacy services.

The library automation and technology fee defrays the cost of equipment, software, and other aspects related to operating the online computerized library service. This fee also protects student access to heavily-used electronic journals and other information services.

The life safety and security fee provides for the assessment and continuing implementation of campus safety measures that includes the "Code Red" emergency notification system to notify students and staff via voice mail, e-mail or text messages should there be an emergency situation. It also helps fund positions within the OSU Police Department.

The O’Collegian fee supports the production and distribution of the newspaper, the Daily O’Collegian, which is an award-winning campus newspaper.

The transit and parking services fee assists with maintenance and operations of the OSU Transportation Services.

The student development fee is used to support student participation in orientation efforts which are linked to recruitment and retention of freshmen as well as transfer students. Development and leadership opportunities for minority students will also be provided by these resources. It is also used to support the campus life to cover costs for the guest speaker series, Student Union programs and the Student Union Activities Board.

The university technology and infrastructure maintenance fee provides for the maintenance of existing facilities, and the expansion and development of central and collegiate facilities, software, and multimedia capabilities. This fee also covers increasing costs in multiple areas, including network and system infrastructure, hardware and software costs and communications.

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 away from the campus area for the entire semester. Such students will be prevented from participating in campus activities and will not be charged student activity, health, student development, and transportation 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 out of area for the entire semester or summer session (clinical laboratory science, geology and forestry summer camps, etc.). Other extenuating circumstances may be cause to consider denying use of and charge for these facilities or participation in activities sponsored by these fees.

Special Fees (In Addition to Mandatory Fees)

<table>
<thead>
<tr>
<th>Fee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application fee</td>
<td></td>
</tr>
<tr>
<td>Undergraduate International students</td>
<td>$75.00</td>
</tr>
<tr>
<td>Undergraduate Domestic students</td>
<td>$40.00</td>
</tr>
<tr>
<td>Graduate Domestic Degree Seeking students</td>
<td>$50.00</td>
</tr>
<tr>
<td>Graduate Domestic Nondegree Seeking students</td>
<td>$25.00</td>
</tr>
<tr>
<td>Graduate International students</td>
<td>$75.00</td>
</tr>
</tbody>
</table>

Audit without credit: tuition and fees are the same as credit enrollments.

Automobile parking permit (per year):

<table>
<thead>
<tr>
<th>Fee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Life/Family Housing permit</td>
<td>$107.00</td>
</tr>
<tr>
<td>Commuter Student permit (Silver &amp; Green zones)</td>
<td>$129.00</td>
</tr>
<tr>
<td>Student Commuter Silver Monroe St. Garage permit</td>
<td>$192.00</td>
</tr>
<tr>
<td>Student SW (Wentz Lane Garage) permit</td>
<td>$321.00</td>
</tr>
<tr>
<td>Student Commuter (Park &amp; Ride) permit</td>
<td>$62.00</td>
</tr>
</tbody>
</table>

Electronically delivered transcript (per transcript; optional service): $8.00

Graduation fees:

<table>
<thead>
<tr>
<th>Fee</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fourth-year osteopathic medicine</td>
<td>$40.00</td>
</tr>
<tr>
<td>Graduate level: Business Professional fee</td>
<td>$250.00</td>
</tr>
</tbody>
</table>

Health risk assessment fee for first-time students - Stillwater campus only: $20.00

International student status maintenance fee per semester: $50.00
Late enrollment fee: 1st day of term $50.00
New Student Orientation & Enrollment fee $75.00
(freshmen & transfer students - one time only)
Reinstatement Fee for Doctoral Candidates (Resident) $830.00 (Nonresident) $2,060.00
Remedial courses: Supplementary fee $24.00
(per credit hour, in addition to the general fee)

College Based Fees (per credit hour):
- Agriculture Technology fee $7.50
- Arts & Sciences Technology fee $7.50
- Business Technology fee $7.50
- Education Technology fee $9.50
- Human Sciences Technology fee $12.00
- Engineering Technology fee $21.50
- SSB Instruction Infrastructure $4.50
- Engineering Facilities/Equipment $37.55
- Arts & Sciences Program fee $27.90
- Business Program fee $25.05
- Education Program fee $28.50
- Human Sciences Program fee $31.60
- HORT & LA Facilities/EquipmentLab $12.00
- ASNR Facilities/Equipment $37.50

Outreach Course Fees

Standard Outreach Credit Courses
Standard outreach credit courses (course sections in the 500 range) adhere to the same tuition and fee schedule as other courses and incur the following supplemental fees that vary by the College offering the course. These courses are internet courses, video courses, Correspondence Education courses and other distance format courses that do not include student travel.

- Agriculture Outreach Fee $85.00 per credit hour
- Arts & Sciences Outreach Fee $85.00 per credit hour
- Education Outreach Fee $85.00 per credit hour
- Engineering Outreach Fee $95.00 per credit hour
- Human Sciences Outreach Fee $90.00 per credit hour
- International Studies & Outreach Fee (undergraduate courses) $75.00 per credit hour
- International Studies & Outreach Fee (graduate courses) $85.00 per credit hour
  - Spears School of Business Outreach Fee (undergraduate courses) $95.00 per credit hour
  - Spears School of Business Outreach Fee (graduate courses) $100.00 per credit hour

Non-Standard Outreach Credit Courses
Tuition and fees for non-standard outreach credit courses (course sections in the 600 range) vary. These courses typically are student travel courses and other special approved programs such as classes within a consortium agreement with an external institution. Both tuition and fees for these courses vary depending on the cost to maintain the course, consortium or related agreements, current travel fees, etc. Tuition and fees for a 600 section are final when the course is proposed by the related academic unit and approved by Academic Affairs prior to the first day of the course. Students may contact the College Outreach Office within the academic unit offering the course or contact the Division of International Studies and Outreach (405-744-6606) to determine tuition and fees for a specific 600-section course.

Other Expenses
Books and supplies used by the student are available in the Student Union Bookstore at reasonable prices and may be charged to the student's Bursar account. Additional incidental and personal expenses such as clothing and entertainment will depend upon the individual student.

Sponsored International Students. Oklahoma State University charges a special administrative/management fee for sponsored international students and scholars who require third party billings and need extra assistance or whose sponsors have indicated a requirement for supplementary assistance beyond that of regular university programming. The customary sponsored student fee is $350 per semester. Sponsored programs may also include items such as special training, research costs, equipment, enrichment, required travel or any other needs deemed necessary by the sponsor. It is the charge of the Office of International Students and Scholars (ISS) to provide the most complete and appropriate educational program for sponsored international students and scholars. The ISS sponsored program is designed to coordinate, expedite and administer all aspects of procedures pertaining to related training. Sponsoring agencies should direct all matters to the Office of International Students and Scholars, 250 Student Union. E-mail may be sent to karen.sebring@okstate.edu. The fax number is 405.744.8120.

Tuition and Fee Waivers for Faculty and Staff
Permanent, full-time, active members of the faculty and staff who meet the requirements under University Policy and Procedures 2-0108 or 3-0744 are eligible to enroll for credit or audit one course per semester or a maximum of five hours during normally scheduled working hours and receive discounted tuition and fees as indicated below. To be eligible under this fee policy, an employee 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. There is no limit on the number of courses a staff member may enroll in after normal working hours. If enrollment does not exceed one course, only the department head's approval is needed to receive a fee waiver. If the staff member is enrolled in more than one course, his or her dean and vice president must also give approval for a fee waiver.

For eligible full time 100% faculty or staff enrolled in University courses, the following fees will be waived:
- a. Student activity fees
- b. Student activity fee - Athletic fee
- c. Health Services fee
- d. Transit/Parking Services fee
- e. Employee Development fee
- f. Daily O'Collegian fee

Faculty and staff must pay 50% of the general tuition, 100% of any additional fees not listed above, as well as 100% of any special course charges. Some courses taught through year-long independent study, extension and outreach are excluded. For faculty and staff members who enroll in NOC-Stillwater outreach courses, the fees listed above may be waived, but no tuition is waived. For more information, contact the department offering the course to determine whether the tuition waiver applies.

Any individual 65 years or older may audit a class at no charge. The audit fee is also waived for faculty and staff who have retired from the University under the Oklahoma Teacher Retirement System's "Rule of 80" or "Rule of 90" regardless of age at time of retirement.

Refund / Withdrawal Refund Policy.
A student dropping a course:
- prior to the end of the sixth day of a regular semester, or the third day of the eight week summer session, or during the proportionate period for block or short courses, will receive a 100 percent refund of tuition and fees.

A student dropping a course:
- after the sixth day of a regular semester but prior to the end of the second week, or after the third day of the eight week summer session through the fifth day, or during the proportionate period for block or short courses, will receive a partial refund of tuition and fees.

A student dropping a course:
- after the second week of the regular semester, or after the first week of the eight week summer session, or during the proportionate period for block or short courses, will not receive a refund. (See Policy and Procedures Letter 02-0206.)

The institution may be required to return Federal Title IV aid to students who received Title IV aid disbursements and subsequently drop/withdraw. If the institution is required to return Title IV funds, the student will be required to pay for the institutional charges originally paid by the aid returned. Please visit the Return to Title IV policy at financialaid.okstate.edu/consumer-information/149-policies-return-to-title-iv.

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. If a student financial aid recipient withdraws and is eligible for a refund of tuition and fees and room and board, all or part of this refund will be used to reimburse Title IV federal financial aid program(s); state programs which apply to tuition (i.e. OKPromise); or institutional tuition and fee waiver programs.

If a student receives Title IV federal aid in excess of institutional charges and subsequently withdraws, he/she may be required to return a portion of the aid. The student is ineligible for further aid until the required repayment has been made. The aid is returned on the student's behalf and a charge is placed on the student Bursar account for the repayment. For additional information, please...
Refund Policy for Students Entering Military Service
If a student is called to active military service during the term in which he or she is enrolled and has not completed sufficient work for receiving grades, the University will waive tuition and fees for that term. The student should submit a withdrawal form to the Office of the Registrar. Once the student has withdrawn and submitted a copy of the military orders, the student will receive a 100% waiver of the tuition and fees or a 100% refund of tuition and fees paid. The military orders, if not available at the time of withdrawal, may be submitted at a later date at which time the waiver will be applied.

Housing and Residential Life 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 2016-2017. All rates include room rent and all utilities, including electricity, water, digital cable television, and Internet connection. All halls are open continuously throughout the academic year. Year round housing (9-month academic contract plus a summer contract) is available in some halls. See the Residential Life website for the most current information, including rates: www.reslife.okstate.edu. All single student housing rates are quoted per person by the month and for those who wish to purchase their contract to move off campus and for late cancellation charges. Family and Graduate Student Housing rates are quoted by the apartment and by the month.

Residence Halls
Traditional. Drummond, Iba, Parker and Wentz Halls offer rooms for men and women by floor. Students are housed in double occupancy rooms. Iba Hall offers year-round housing.

<table>
<thead>
<tr>
<th>Per Person - Academic Year (Drummond, Parker &amp; Wentz) or 12 month contract (Iba only)</th>
<th>Monthly Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room</td>
<td>$445.00</td>
</tr>
<tr>
<td>Stout Honors Hall offers three floors of double occupancy rooms. The fourth floor provides smaller designed - single rooms for non-freshman, non-honors students. Stout Hall offers 9-month housing only.</td>
<td></td>
</tr>
<tr>
<td>Per Person - Academic Year</td>
<td>Monthly Rate</td>
</tr>
<tr>
<td>Private Room</td>
<td>$710.00</td>
</tr>
<tr>
<td>Double Room</td>
<td>$480.00</td>
</tr>
</tbody>
</table>

University Commons
University Commons offers 9-month housing in a modified traditional layout. Students live in double occupancy rooms, and share a common bathroom with 8-10 other students. University Commons North offers housing for women only; University Commons West and South offer co-ed housing by floor.

<table>
<thead>
<tr>
<th>Per Person - Academic Year</th>
<th>Monthly Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room</td>
<td>$675.00</td>
</tr>
</tbody>
</table>

Furnished Deluxe Suites - Living Room in the Unit: Allen, Bennett, Booker, Jones, Patchin, Stinchcomb, and Zink Halls all offer deluxe suites for men and women with a living room in the unit, and all halls except Bennett offer a small kitchenette in the unit. These halls offer 9 month housing only.

<table>
<thead>
<tr>
<th>Per Person - Academic Year</th>
<th>Monthly Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Bdrm/2 Bath-private bedroom (Patchin-Jones, Zink-Allen)</td>
<td>$720.00</td>
</tr>
<tr>
<td>2 Bdrm/1 Bath-private bedroom (Booker, Stinchcomb)</td>
<td>$780.00</td>
</tr>
<tr>
<td>2 Bdrm/2 Bath-shared bedroom (Patchin-Jones, Zink-Allen)</td>
<td>$550.00</td>
</tr>
<tr>
<td>1 Bdrm/1 Bath-shared bedroom (Booker, Stinchcomb)</td>
<td>$650.00</td>
</tr>
<tr>
<td>2 or 3 Bed/2 Bath-shared bedroom (Bennett)</td>
<td>$490.00</td>
</tr>
<tr>
<td>2 Bd1 Bath or 3/4 Bd2 Bath-private bdrm (lg) (Bennett)</td>
<td>$720.00</td>
</tr>
<tr>
<td>2 Bd1 Bath or 3/4 Bd2 Bath-private bdrm (med) (Bennett)</td>
<td>$670.00</td>
</tr>
<tr>
<td>2 Bd1 Bath or 3/4 Bd2 Bath-private bdrm (sm) (Bennett)</td>
<td>$635.00</td>
</tr>
<tr>
<td>1 Bdrm/1 Bath-private bedroom (large) (Bennett)</td>
<td>$620.00</td>
</tr>
</tbody>
</table>

Family and Graduate Student Housing. The University operates apartments to house married and single parents, and a limited number of single graduate and upper class students. Priority is given to families and graduate students. Individuals should apply eight to ten months in advance to assure choice of apartments. Furnished and unfurnished apartments are available. For a complete listing of available furniture, please see the Family and Graduate Student Handbook at www.reslife.okstate.edu.

The following 2016-2017 rates include all utilities (gas, water, electricity, digital cable television, and Internet connection). Please visit the Housing and Residential Life website at www.reslife.okstate.edu for the most up-to-date rates and information. All rates are quoted by the apartment unit (roommates can share the expenses).

<table>
<thead>
<tr>
<th>Per Person - Academic Year</th>
<th>Monthly Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Bedroom,2 Bath (Morsani-Smith, Bost, Peterson-Friend, Kamm, and Davis)</td>
<td>$735.00</td>
</tr>
<tr>
<td>2 Bedroom,2 Bath (Morsani-Smith, Peterson-Friend, Sitlington, Davis and Young)</td>
<td>$890.00</td>
</tr>
<tr>
<td>2 Bedroom,1 Bath - shared bedroom (Payne-Elis, Carreker, McPherson)</td>
<td>$660.00</td>
</tr>
<tr>
<td>2 Bedroom,1 Bath - private bedroom (Payne-Ellis, Carreker, McPherson)</td>
<td>$735.00</td>
</tr>
</tbody>
</table>

Unfurnished Apartments. Bost, Davis, Sittlington, Kamm

<table>
<thead>
<tr>
<th>Per Person - Academic Year</th>
<th>Monthly Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Bedroom,2 Bath (Bost, Davis, Kamm)</td>
<td>$690.00</td>
</tr>
<tr>
<td>2 Bedroom,2 Bath (Davis, Sittlington)</td>
<td>$845.00</td>
</tr>
</tbody>
</table>

University Dining Services Meal Plans
University Dining Services (UDS) offers more than 30 dining options at the Oklahoma State University campus. UDS makes every effort to provide options to satisfy the hungriest student, the most selective eater, and those who prefer vegetarian options or have limited diets. The choices are endless, with something available from early morning to late night. From national franchises and specialty restaurants to convenience stores with freshly-made grab and go options, UDS provides students with the very best offerings. As UDS meal plan holders, students can use their meal plans in any of these 30 locations. Of course, other methods of payment can be used, including bursar charge, cash, and credit cards.

Freshmen who are living on-campus are required to have a minimum meal plan of the Bronze level, but can choose a higher level. Visit the Return to Title IV policy at financialaid.okstate.edu/consumer-information/149-policies-return-to-title-iv.
Meal Plan Charges:

- Meal plans are based on a declining dollars system. It works just like a debit card. Each time a student eats at a UDS dining outlet, the dollar amount spent is deducted from their balance. In the table below, “cost per semester” is equal to the starting balance of dollars available in the student’s meal plan account.

- A maximum amount may be carried over from semester to semester. To receive the carry-over, the meal plan holder must have a contracted meal plan (not the G plan) for the following semester.

- Meal plan holders can eat in any of the dining outlets regardless of where they live. Meals can be eaten at the convenience of the students: when they want, where they want, as often as they want.

The table below describes the University Dining meal plans available:

<table>
<thead>
<tr>
<th>Contracted Meal Plan</th>
<th>2016-17 Cost per semester</th>
<th>Maximum Carryover with Meal Plan Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum contract</td>
<td>$2,125</td>
<td>$300</td>
</tr>
<tr>
<td>Gold contract</td>
<td>$1,850</td>
<td>$280</td>
</tr>
<tr>
<td>Silver contract</td>
<td>$1,580</td>
<td>$220</td>
</tr>
<tr>
<td>Bronze contract*</td>
<td>$1,340</td>
<td>$190</td>
</tr>
<tr>
<td>Copper contract</td>
<td>$1,050</td>
<td>$160</td>
</tr>
</tbody>
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*Minimum meal plan for freshmen living on campus

Plan G (non-contract) Dining dollars in increments of $100

*Freshmen living on campus must choose from the Bronze meal plan or higher.

**Non-contracted G plan is for students (except freshmen living on campus) who want occasional meals. Start with a minimum of $100 and balance will carry over from semester to semester.

Anyone can purchase a UDS plan, including on-campus residents, off-campus students, and faculty and staff members. For more information, contact the Dining Services Office at 405.744.4424 or see the website at dining.okstate.edu.
Bursar

Office of the Bursar
Laurie Beets—Director
Kim Miller—Assistant Director
Wilma White—Assistant Bursar
Joy Meyer—Manager of Student Loans/Debt Management
Tonya Jones—Financial Counselor
Steven Prudhomme—Senior Accountant
Cindy Buford—Manager of Teller Operations
Jonny Rogers—Senior Accountant

Campus Address and Phone:
113 Student Union, Stillwater, OK 74078-1014
405.744.3217
Website: www.bursar.okstate.edu E-mail: bursar@okstate.edu

Financial Obligation
Enrollment at Oklahoma State University incurs a financial obligation and responsibility of the student to pay all amounts owed in a timely manner. In order to remain in favorable 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 billing due dates. By enrolling/registering in classes, you are accepting the responsibility of the costs associated with the courses unless you drop/withdraw by the published dates to receive credit.

Federal law limits the information the University may provide to parents of OSU students. School officials may not disclose personally identifiable information about students or permit inspection of their records without written permission from the student, unless the Registrar’s Office has a Student Consent of Parental Access form on file.

Oklahoma State University combines enrollment costs and charges from different areas on campus into one consolidated student account. The Bursar Office generates a monthly electronic billing statement (e-bill) on the last business day of every month detailing charges, credits, and payments that occurred during the month. A billing notification is e-mailed to the student’s University e-mail address and authorized users at the beginning of each month. A student must have an active University e-mail address to receive his/her e-bill notification. It is the student’s responsibility to maintain accurate addresses in Student Self Service. An alternative email address and authorized user may be set up through the OSU Student Self Service system at my.okstate.edu by clicking on the bursar section if someone other than the student should receive billing notifications. Students can view their billing statement, semester account activity, set up authorized users, and pay online via Student Self Service at my.okstate.edu by clicking on the bursar section. Authorized user login is located through the bursar website at http://bursar.okstate.edu.

Payment is due prior to the 15th of each month. Late fees and holds can be avoided by paying by the published deadline. Accounts must be paid in full before a student is eligible to enroll for future semesters or receive any records from the University. A late payment penalty of 1.5% will be assessed monthly (19.56% APR) for any past due charges. All tuition and fees (required and optional) and other charges (including housing/meal plans) are due prior to the 15th of the billing month.

It is the student’s responsibility to check his/her individual bursar account to verify that University-administered scholarships and waivers, as well as external scholarships, have been credited. Failure to view a bill does not relieve the student of his/her financial obligation, any late charges, and other penalties that may occur if the account is not paid by billing due dates.

In efforts to assist our students in meeting financial obligations, Oklahoma State University offers a semester based payment plan as an alternative to the traditional lump-sum payment method. This plan provides an opportunity for families (authorized users) and students to pay University-billed expenses in regular monthly payments. No finance charges are associated with the payment plan or enrollment holds if payments are made as promised. The payment plan is available online each semester. The student can sign-up online via Student self service at my.okstate.edu by clicking on the bursar section. It is important to designate a parent under the authorized user tab by entering their email address for access to the payment plan enrollment. September 15th is the deadline to enroll in the Fall plan and February 15th is the deadline to enroll for the Spring plan. Summer enrollment is not eligible for the plan. There is a $25 non-refundable application fee due at the time of application each semester. Payment plan participants receive installment payment due notifications in separate emails from the monthly billing notification. The monthly billing notification informs payment plan participants of the total monthly billing statement amount for informational purposes only. A paper check as payment authorizes Oklahoma State University to clear that check electronically. Bank accounts may be debited the same day payment is received. Electronically cleared transactions appear on bank statements even though paper checks are not presented to the financial institution. Any resubmission due to insufficient funds may also occur electronically. All transactions are secure and payment by check constitutes acceptance of these terms. Returned items are assessed a $25 fee and the account holder is responsible for all dishonored payments which have been processed on their account. If a payment is returned to the University by the bank and the payment was made to get enrolled, the Bursar may cancel enrollment and referral to student conduct is a possibility.

A student experiencing financial difficulties should immediately contact the Office of the Bursar for assistance and guidance. All delinquent accounts accrue a penalty at the rate of 1.5% monthly (19.56% APR). A student may be contacted on all phone numbers, including cell phones, provided to the University as a source of contact. This includes contact from its agents, representatives, and attorneys (including collection agencies) for purposes of collecting any portion of the account financial obligation which is past due. Any charges incurred by the University in an effort to collect on delinquent accounts will be assessed to and will be the responsibility of the account holder. A student will reimburse the University the fees of any collection agency which may be based on a percentage of the debt (at a maximum of 33.3%). All costs and expenses including reasonable attorney’s fees the University incurs in such collection efforts will also be owed the University. These costs will be assessed to the student’s bursar account and included in the balance due. Delinquent account information is disclosed to credit reporting agencies, which could endanger the student’s credit rating on a local or national level. Past due accounts are presented to the warrant intercept program (WIP) that captures state income tax refunds to pay outstanding OSU debt. Oklahoma law has jurisdiction and action may be taken to enforce and collect upon this debt. Accounts must be cleared before a student can obtain the release of any academic records such as a transcript, receive a diploma or enroll for subsequent semesters. Oklahoma State University extends bursar optional charging privileges to students in order to facilitate use of campus based services. Bursar accounts must remain current or charging privileges may be revoked. Unresolved past due bursar account obligations can automatically terminate future term enrollment. The University reserves the right to request prepayment before allowing registration for future terms based upon previous actions.

It is the policy of the University to apply all financial aid to the student’s bursar account, withhold all semester charges incurred (tuition, fees, housing, etc.), and refund the excess, if any. Bursar account credits resulting from a credit card payment are refunded back to the credit card, not to the student. To restrict federal Title IV financial aid disbursements to pay only current semester qualified educational expenses, complete the TIV form at http://bursar.okstate.edu/forms. If a student’s federal or institutional financial aid is either not received by Oklahoma State University or loss of eligibility to retain financial aid for the semester occurs, the student still has the responsibility for paying their bursar account obligations.

Refunds
The direct deposit refund program was developed to provide quicker access to refunds when bursar accounts have semester credit balances. By participating in direct deposit, a refund electronically transfers to a designated bank account within 48 hours after the credit balance becomes effective. Financial institutions have individualized policies when posting electronic transfers to accounts; so deposit of funds should be confirmed prior to use. Direct deposit authorization may be completed online through Student Self Service at my.okstate.edu by clicking on the bursar section. Refunds will be issued by paper check for students not participating in direct deposit. Checks are mailed to the local address listed in the student’s bursar account approximately ten business days after the credit balance becomes effective. OSU complies with the U.S. Department of Education rules and regulations in accordance with The Federal Student Financial Aid Handbook instructions. Direct deposit refunds routinely occur daily and early in the semester, often before bookstore and other miscellaneous charges are processed. Students are responsible for paying these subsequent charges as they appear on monthly bursar billing statements. If the student is participating in a semester payment plan, and has also been awarded financial aid, our office will be unable to refund any resulting student account credit balance until the student’s payment plan has been completely paid off. Cancellation of the payment plan must be submitted in writing or email.
Title IV Authorization
Title IV financial aid federally funded aid such as Federal Pell Grant, Federal Supplemental Educational Opportunity Grant (SEOG), Federal Perkins Loan, Federal Subsidized and Unsubsidized Direct Loans. The US Department of Education requires OSU to obtain authorization to pay all charges on your bursar account for the current semester with Title IV financial aid with question #1 on your online financial aid tab. If you declined or do not accept (question #1), then Title IV aid will only pay current tuition, related fees, room and board (if contracted with the OSU). Other current semester charges such as your parking permit, library fines, athletic all sports ticket, and health center charges will remain unpaid which could result in having an enrollment hold if not paid by the due date, even if you have a credit balance on your account after authorized charges have been paid. If you choose not to provide authorization to pay non-institutional charges with your federal financial aid, you could receive a refund check and still owe a balance on your student account for non-institutional charges.

Accept question #2, if you desire to allow OSU to apply Title IV financial aid to previous year institutional charges for all charges on your student account for the previous, as well as the current semester charges. Beginning July 1, 2008, the amount of Title IV financial aid that can be used to pay prior academic year charges is limited to a total of not more than $200. If you decline, Title IV aid will only pay current academic year charges. Summer term charges are considered prior academic year charges in the Fall term. Even if you have a balance on your account after your current year charges are paid, you will have to pay any previous academic year charges with other funds or risk having enrollment hold. You do not have to authorize again once you are a student at OSU. It is recommended all students who have applied for financial aid accept or decline, so at some point in the future, if you do receive Title IV financial aid, this authorization will already have been given.

Third-Party (Non-OSU) Scholarships
Many students receive various scholarships from sponsors external to OSU. Typically, the sponsoring organization sends funds directly to the University to be applied to the student’s account for payment of costs associated with attending OSU. Funds are equally split between fall and spring semesters (example: $1000 = $500 for fall and $500 for spring) unless otherwise directed by the sponsor’s documentation. Scholarship funds received directly by the student should be brought to the Bursar Office for deposit to his/her bursar account to facilitate the necessary governmental reporting. Notify the Bursar Office prior to the semester’s due date when a sponsor requires a billing invoice from OSU in order to process payment.

1098-T-Form
OSU is required annually to furnish you with a Form 1098-T, Tuition Statement, which reports qualified tuition and related expenses associated with your enrollment at OSU. This information assists you in determining whether you, or the person who can claim you as a dependent, may take either the tuition and fees deduction or claim an education credit to reduce federal income tax. For more information, see IRS Pub. 970. Tax Benefits for Education. Log into my.okstate.edu by clicking on the bursar section under the Payment Info heading and your 1098T statement is located on the welcome screen just below Statements. In order for us to prepare the forms accurately, Federal law requires you to furnish us with your correct taxpayer identification number (TIN). Generally, this number is your Social Security Number (SSN) or, if you are not eligible to obtain an SSN, you must obtain from the Internal Revenue Service (IRS) an individual taxpayer identification number (ITIN) and provide that number to us. Bring the Form W-9S (www.irs.gov) to provide your correct SSN or TIN to the Bursar Office or take your Social Security card to the Registrar’s Office. Failure to furnish a correct TIN (SSN) may result in the IRS assessing you a $50 penalty.

Leave of Absence for Active Military Duty
Per Oklahoma State law (SB 1830), OSU offers a military leave of absence (MLOA) to students who are members of the active uniformed military services of the United States who are called to active duty. An MLOA allows a student to be absent from the University for active duty without penalty to admission status or grade point average and without loss of institutional financial aid. It also allows the student to be eligible for withdrawal from all or some classes with a full refund of tuition and fees or to be eligible for incomplete grades in classes for which he/she has successfully completed at least 50% of the coursework at the time of leave, if the student intends to complete the classes upon return from active duty. MLOAs shall not exceed a cumulative five years. Graduate student LOAs are for a period of one year with annual extensions possible up to the five-year cumulative limit. Students apply for MLOA by submitting the appropriate form and supporting documentation. See OSU Military Leave of Absence FAQs on the Registrar website (registrar.okstate.edu) for more information.
Academic Enrichment Programs

The Honors College
Keith Garbutt, PhD—Dean
Ebonie Hill-Williamson—Interim Assistant Director
Amanda Booth—Honors Academic Counselor
O’doma Dean—Honors Academic Counselor
Cynthia Lane—Honors Academic Counselor
Shelley Schauer—Administrative Assistant

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

Completion of the requirements for the General Honors Award leads to special designation on the student’s OSU transcript, as does completion of the requirements for the Departmental or College Honors Award in the student’s academic major. Students who earn a minimum of 36 honors credit hours and complete the Departmental or College Honors Award, with a 3.50 retention/ graduation grade-point average at graduation, receive the Honors College Degree including a special entry on their transcripts and special honors diploma. Additional advantages for active participants in The Honors College (minimum of three honors credit hours per semester and nine honors credit hours for each two consecutive semesters for freshmen and sophomores and three honors credit hours per semester for juniors and seniors) include use of The Honors College study lounge in Old Central (with a computer lab), extended check-out privileges for library materials, priority enrollment for the following semester, and honors housing option in Stout or Bennett Hall (on a rooms-available basis).

Admission of new freshmen to The Honors College is based on an ACT composite score of 27 or higher (or comparable SAT score) with a high school weighted or unweighted grade-point average of 3.75 or higher. Application for admittance to the Honors College is integrated into the OSU Application for Admission. A composite score of 22 or higher (or comparable SAT score) with a high school weighted or unweighted grade-point average of 3.50 or higher is required for admission. Transfer freshmen must have completed at least seven college credit hours (not including concurrent enrollment while in high school) to be eligible on the basis of college performance if they do not have the required high school grade-point average and ACT score. There is a February 1 deadline for regular acceptance based on the criteria outlined above. Applications submitted after February 1 will be considered on a space-available basis.

For more information about The Honors College, interested students should consult the Dean or Interim Assistant Director of The Honors College, 101 Old Central or visit http://honors.okstate.edu.

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, multi-day seminars with a distinguished scholar and are selected from Oklahoma’s 21 four-year colleges and universities. OSU’s sophomore, junior and senior students with a 3.00 GPA are eligible to apply. OSLEP seminars are taken for 1-3 hours of credit. The only cost to students is the tuition - the program provides books and room and board during the seminar. The seminars are graded on a satisfactory/unsatisfactory basis and are 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, Dr. Keith Garbutt, The Honors College, 101 Old Central.

Henry Bellmon Office of Scholar Development and Undergraduate Research
Jessica Roark—Director
Tim O’Neil—Program Coordinator and Editor-in-Chief, Oklahoma Journal of Undergraduate Research
Cathy Lopez—Administrative Assistant

OSU has long been a national leader and innovator in scholar development and, more recently, undergraduate research. For over 25 years, this office has prepared students for the future, whether in competition for prestigious national/international fellowships, admission to top graduate schools, securing highly competitive jobs, or attaining the skills required to grow as a leader. We offer diverse programs, targeted to a wide range of majors, year classifications, and interests in order to elevate a large number of students’ undergraduate experience. This office enhances undergraduate opportunity, encourages student-faculty mentoring, and promotes retention through five primary areas:

1. Scholarship/Fellowship Success
Outstanding students can compete for a wide range of prestigious national and international scholarships as sophomores, juniors and seniors at OSU, such as the Rhodes, Marshall, Truman, Goldwater, Udall, and others. In addition, there is a host of lesser-known but still valuable opportunities that require students to prepare competitive applications. This office monitors student progress, provides important information, supplies support, and plans courses and activities that can lead to success in these areas. Interested students can contact the office to inquire about opportunities and strategies. Often faculty will nominate candidates who have been performing at a high level academically and displaying other qualities through leadership and community service. Early identification of freshmen and sophomores is especially important in order for the student to gain the most from these programs.

2. Burns and Ann Hargis Writers’ Workshop
All successful applicants who are awarded with an OSU institutional nomination for the Truman, Goldwater, and Udall scholarships receive an invitation to participate in the annual Burns and Ann Hargis Writers’ Workshop at the OSU Doel Reed Center for the Arts in Taos, New Mexico. Significant scholarship support is provided for each nominee to participate in the workshop, which is held during the last week of students’ winter break (early January). OSU faculty and staff from the office join forces to mentor student nominees and to provide feedback on their national application materials.

3. Undergraduate Research
An incentive for the kinds of students who are considered OSU’s best and brightest, the Lew Wentz Foundation, Robberson Trust, and generous donors provide substantial private funding to OSU for several scholarship programs that are managed in this office. The programs include:

- Wentz Research Grant - an opportunity for undergraduates to plan and perform high level research under the direction of a faculty mentor ($4,500 each)
- Freshman Research Scholars Program - whereby top entering students can begin their careers with a scholarship for an orientation to research ($1,000 each)
- Oklahoma Journal of Undergraduate Research - a new opportunity for students to share their academic accomplishments, whereby articles by students are reviewed by a faculty editorial board for selective digital publication.

4. Cambridge Scholars Program
This two-week summer program brings up to 22 of OSU’s top students to the University of Cambridge, UK for a special short course taught by OSU faculty or distinguished OSU graduate. The program also provides substantial scholarship support for students.

5. Individual and Institutional Recognition
This office strives to promote scholarship and undergraduate research at the highest level at OSU through the formal recognition of both individual students and faculty, as well as through the promotion of the University as a whole. Visit the Halligan Hall of Scholars in the Student Union atrium for more information. For further information on all programs, please contact the office at 405.744.7913 or visit www.okstate.edu/scholars.
University College Advising

Missy Wilke—Director of First Year Experience

University College Advising provides academic advising and assistance to a variety of diverse student populations. Students advised by University College Advising (UCA) include, but are not limited to, undecided students and those admitted through the alternative admission and holistic admission programs. UCA is also the advising home for undecided transfer students, some students on academic probation and students needing help in developing/determining individualized degree plans. The overall goal of UCA is to retain students by providing personal attention and assistance as they adjust to OSU and explore their academic options. Students may contact University College Advising at 405.744.5333 in 214 Student Union, or visit the website at uca.okstate.edu for more information.

The following programs are offered through University College Advising:

Freshman Programs.

• Students who are undecided with interests spanning more than one academic college, are advised through University College Advising.

• Freshmen applicants who do not meet OSU’s assured admission criteria are reviewed by the Admissions Review Committee, which is composed of Undergraduate Admissions staff members. Students reviewed by this committee are eligible for two admission categories: holistic admission or alternative admission. Students admitted under either program are fully admitted to OSU and are advised through University College Advising.

Holistic Admission: Applicants whose records demonstrate a 3.0 high school GPA in their 15-unit core OR 22 ACT OR 1020 SAT may qualify for further review by the Admissions Review Committee for holistic admission. This committee completes a holistic review of the applicant’s file, including a review of responses to the application essay questions, high school GPA, class rank, test scores and letters of recommendation.

Alternative Admission: The Alternative Admissions Program allows a certain percentage of incoming freshmen (currently 6% of the previous year’s freshman class) to attend OSU without meeting all of the regular or holistic admissions requirements, but who meet minimum criteria and show potential for success as demonstrated by responses to the application essay questions, high school GPA, class rank, test scores and letters of recommendation.

In addition to academic advising, UCA provides students with a First-Year Seminar (UNIV 1111) designed to help freshmen adjust to the demands of college life; learn how to become academically successful; explore various major and career options; and make students aware of university rules and regulations. This class is taught by UCA advisors in conjunction with the college’s Student Academic Mentor Program. Academic advisors in UCA also enforce any required remediation of academic skills deficiencies, based on ACT area scores below a 19. After remediating any deficiencies and completing one semester with a 3.0 GPA or higher or two semesters with a minimum 2.00 GPA, students may generally transfer to their academic college of choice, depending on their college and department’s individual GPA and course requirements.

University Academic Assessment Program. The University Academic Assessment Program is designed for students who have experienced academic difficulty at the college level, including:

• students who are placed on academic probation;
• freshmen on academic notice;
• transfer students admitted on probation;
• students who are in good academic standing, according to State Regents’ policy, who are ineligible for admission to their desired college or major; and
• students who left OSU while on probation or suspension and have stayed out of college for a minimum of one regular semester, and who are readmitted to OSU based on a demonstrated potential for success.

Transfer Probation. A select group of transfer students are admitted to OSU with below the minimum but not requirements by a joint decision of the student’s academic college of choice and University College Advising. These students are on probation and will be allowed to continue at OSU only if their first semester GPA is a 2.0 or greater or they maintain a graduation/retention GPA above the minimum standards. These students include:

• students admitted with 0-60 hours attempted with less than a 2.25 GPA;
• students admitted with more than 61 hours attempted with below a 2.0 GPA; and
• students who have earned less than 24 credit hours and were not admissible from high school.

In conjunction with hands-on academic advising, University College advisers assist Academic Assessment and Transfer Probation students in developing realistic plans of study through graduation. They inform students of important policies and requirements, such as the minimum grade-point averages required by the Oklahoma State Regents for Higher Education and by specific majors, as well as the repeat and reprove options.

Bachelor of University Studies. Occasionally a student experiences great difficulty in finding a degree plan appropriate for his/her interests and career goals. In this case, an individual degree plan may be developed to meet State Regents’ and OSU’s degree requirements. Academic advisors in UCA can be instrumental in helping draft the initial stages of such plans, which are then forwarded to the academic colleges for approval.

Student Academic Mentor Program. The Student Academic Mentor (SAM) Program is a free service that connects new UCA freshmen with experienced OSU students in an effort to ease their transition to college, specifically through assisting in their First-Year Seminar course (UNIV 1111). “SAMs” are carefully selected from continuing students at OSU to help freshmen feel welcome and to assimilate them into campus life, socially as well as academically. For more information visit uca.okstate.edu.

Academic Advising

Academic advising is a major function within the University and serves the student first and foremost. Advising assists students in developing their intellectual potential through effective use of all resources available at the University—academic, cultural and social. The role of the student’s academic adviser is to (1) assist in educational planning, including clarification of career and academic planning goals, curricular planning, and short-term course selection, (2) become aware of and make appropriate referrals to campus support services, (3) provide information to prospective majors, and (4) prepare degree plans for graduating seniors and submit these to the respective college graduation certification office.

Advising is performed within each of the undergraduate colleges and in University College Advising. 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 declared majors are advised in their major department. In the Division of Agricultural Sciences and Natural Resources, all students are advised by faculty members.

Each college has an office of student academic services to represent the dean in matters concerning undergraduate students. Students should 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

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.

LASSO Center

Monty Stallings—Program Coordinator

The LASSO Center provides academic support through a variety of programs. In addition to free tutoring for undergraduate courses, we also provide supplemental instruction for select courses and academic success coaching to all students, both of which are also free. The LASSO Center is located in 201 Classroom Building. The administrative offices are open Monday - Friday 8 a.m. to 5 p.m., but the tutoring center has extended hours during the fall and spring semesters. For more information please visit lasso.okstate.edu.

Academic Success Coaches. The academic success coaching program at Oklahoma State University offers individualized attention to help students adjust personally and academically both as they transition from high school to college and as they progress through their college experience. Coaches assist students with refining academic skills such as time management, effective study methods, identifying personal strengths, and developing school/life balance. Coaches also aid students in identifying and connecting with people, organizations, and programs appropriate to their needs and interests. To request a coach or find more information on the program, please visit lasso.okstate.edu or call 405.744.3309.
University Assessment and Testing
James Knecht—Interim Director
The assessment program at OSU supports institutional, college, and program improvement efforts and provides public assurance of program quality and accountability by documenting progress toward meeting educational goals. Assessment involves collecting, reviewing, and using information about students’ learning and development for the purpose of improving student achievement and educational programs. Assessment is an integral part of the institution’s commitment to sustain and enhance academic quality and students’ educational experiences.

The OSU Assessment and Academic Improvement Council (AAIC) guides the institution’s assessment plan. Membership of the AAIC consists of faculty from each college and representatives from the offices of Student Affairs, Institutional Research, Libraries, and student government. The AAIC supports assessment by providing funding for other resources to (1) measure the effectiveness of academic and student programs, (2) use the information provided by assessment to improve student learning and (3) determine the overall educational impact of the university experience on students.

Assessment activity at OSU, coordinated by the Office of University Assessment and Testing, includes primary initiatives:

1. Entry-Level Assessment assists advisers and faculty in making placement decisions to give students the best chance of academic success.
2. General Education Assessment evaluates student achievement of institutionally recognized general education competencies, including communication, problem solving, diversity, and critical thinking skills.
3. Program Outcome Assessment evaluates achievement of learning goals in the major.
4. Student and Alumni Satisfaction Assessment evaluates students’ and alumni’s perceptions of academic and campus programs and services.

Results of these assessments provide information for improvement of programs and services, of students’ achievement of learning goals, and of students’ satisfaction with their educational experience.

In addition to the above assessment activities, the Office of University Assessment and Testing periodically administers national measures of student engagement and learning. Results from national measures of student engagement and learning are used for program and institutional improvement and for participation in accountability initiatives.

Many assessment and academic programs and the institution are conducted by evaluating samples of student work selected from course assignments. These assessments are conducted for institutional or program purposes and are not connected to grading in the course. Appropriate steps are taken to assure that confidentiality of students’ work is protected, including the removal of identifying information from samples before they are evaluated by faculty members. Results from placement testing will be periodically reviewed for accuracy of placement decisions and shared to inform placement practices at other institutions. Results will be kept strictly confidential and shared only in aggregate form.

The Office of University Assessment and Testing submits annual reports to the Oklahoma State Regents for Higher Education that summarize the assessments in the above areas. The learning goals, assessment methods used, student population involved, results, and uses of assessment data are reported for assessment in each initiative area, including separate outcome assessment reports prepared by each academic program.

3. The Ethics Center

Ethics Center
Scott Gelfand, PhD—Associate Professor and Director
The Ethics Center at Oklahoma State University is committed to promoting moral reflection and deliberation in personal, professional, community, and civic life. The Ethics Center does not seek to dictate values; rather, we attempt to meet our organizational commitments by organizing and promoting workshops, symposia, conferences, and other forums where those interested, including professional ethicists, faculty, students, and the general public, can study and discuss relevant topics. In addition, we will attempt to support research relating to applied and professional ethics. Finally, the Ethics Center will provide Oklahoma State University with a centralized office that students, faculty and the public can contact to find out what ethics classes and resources are available.

The Ethics Center is sponsored and operated by the Philosophy Department at Oklahoma State University, under the direction of Dr. Scott Gelfand, and overseen by a standing committee of faculty members having research and teaching interests in applied and professional ethics.

Gerontology Institute
Alex Bishop, PhD—Associate Professor and Gerontology Program Coordinator
The Gerontology Institute is housed in the Department of Human Development and Family Science. The Gerontology Institute operates in conjunction with a gerontology masters program committed to promoting excellence in the study and understanding of aging across the life course through scientific research, education, and service.

The Gerontology Institute was created in response to a widespread interest in course offerings in gerontology. Students can receive an MS in Human Development and Family Science with an option in gerontology. Undergraduates
may earn a BS in Human Development and Family Science with a professional track in aging services with in the child and family services option. An undergraduate gerontology minor is also offered. Students wanting to attain an MS with an option in gerontology may complete the on-campus program in HDF or the Great Plains Interactive Distance Education Alternative online gerontology program (Great Plains IDEA) at OSU. Students may also seek a graduate certificate in gerontology through the on-campus program in HDFS. For more information on the online gerontology program see gpdie.okstate.edu.

The Gerontology Institute serves as a link between the University and the community in the field of aging. For more information, visit humanities.okstate.edu or e-mail humanities.hdfs@okstate.edu.

The Institute for Teaching and Learning Excellence (ITLE) Christine K. Ormsbee, PhD—Assistant Provost and Director; A.J. and Susan Jacques Endowed Professor of Educational Administration

The Institute for Teaching and Learning Excellence (ITLE) provides an array of multi-media services to support the development and delivery of high quality instruction using a variety of class formats. Employing the most up-to-date and effective teaching tools, ITLE is responsible for supporting faculty, instructors, and students. ITLE provides a variety of professional development opportunities on innovative pedagogies and technology integration such as ITLE Live, a 30-minute livestream event each Friday morning; two six-week courses titled, “Preparing Online Instructors” and “Scholars of Teaching and Learning;” “OSU Faculty Reads,” a monthly book reading program and monthly face-to-face faculty development sessions. In addition, ITLE cooperates with campus departments on teaching and learning-related research projects to provide the professional development motivation requested. ITLE also produces video-based educational content from recording and editing classroom presentations for delivery via multiple media formats, to distributing live, interactive classes world-wide from high-tech classrooms across the campus. ITLE houses a high-definition, broadcast-quality television production, editing, and transmission facility, which is used for everything from recording classroom presentations and producing high-quality animation/simulation segments to the production of teleconferences, documentaries, video training presentations, and public service announcements for the University and for both government and commercial agencies. Also, faculty can record presentations in a broadcast-quality studio or in a more relaxed office-like setting in a Camtasia/Webcam studio. The ITLE building has a large multi-media conference room and a smaller围绕教室, the facility is available for professional development events and other campus activities. A wide array of equipment may be checked out by faculty members for portable and/or classroom use where that technology may not be available.

ITLE provides equipment and staffing to support web-based courses as well as technical assistance, for the Desire2Learn “Online Classroom” Courseware Management System. ITLE also manages the Campus Cable TV system, working with the cable company to provide educational and entertainment programming of interest to the OSU community.

The ITLE facility provides an outlet for student internships in art, production, and programming of interest to the OSU community. Although the staff is generally composed of individuals from diverse ethnic backgrounds, there is a graduated fee structure based on one’s financial situation.

The Center schedules appointments from 8:00 a.m. until 7:00 p.m. Monday through Thursday. On Friday, appointments are scheduled from 8:00 a.m. until 5:00 p.m. Appointments can be made by contacting the Center at 405.744.5975. More information can be found at http://psychology.okstate.edu/psychology-services.

Speech-Language Hearing Clinic Maureen Sullivan, PhD—Associate Professor and Interim Head

The OSU Speech-Language-Hearing Clinic provides comprehensive clinical services to the OSU/Stillwater and the Tulsa communities. We are dedicated to providing the highest standard of care in speech-language pathology and audiology. Nationally certified and state licensed clinical faculty supervise graduate student clinicians as they provide a wide range of diagnostic, speech, language, and hearing therapy services, including early intervention. Treatment is provided for a variety of communication disorders, delays and/or differences across the lifespan including:

- Articulation disorders
- Language disorders
- Stuttering
- Autism
- Voice disorders
- Swallowing disorders
- Language, cognitive, and speech disorders resulting from stroke, head injury, dementia, and other neurological impairments

The NSE also enables students from member colleges and universities to attend OSU while paying their own university’s tuition and fees or while paying OSU resident tuition rates. For additional information and application materials, visit https://abroad.okstate.edu/outgoing/programs/nse, contact the Study Abroad/NSE Office, 242 Student Union or e-mail abroad@okstate.edu.

OSUTeach

The OSUTeach program is designed to increase career options for majors in science and mathematics by preparing students as secondary teachers. OSUTeach offers four-year STEM degree options in biological science, chemistry, geology, mathematics, and physics, which lead to a B.S. in the selected discipline and teacher certification at the secondary level. OSUTeach is a collaboration between the College of Education and the College of Arts and Sciences. OSUTeach students begin supervised teaching in K-12 classrooms during their first semester in the program and continue these field experiences throughout their coursework, which culminates with apprentice teaching.

Pre-Law, Pre-Medicine and Other Pre-Professional Health Programs

Students planning to enter a professional school should visit with their advisers and consult professional school admission and course work requirements listed in the specific school catalog. Many professional schools select students with a variety of bachelor’s degrees, although others may require a minimum core curriculum of varying length and grade-point average. Information about pre-professional programs is available in such areas as chiropractic medicine, clinical laboratory science, dental hygiene, dentistry, forensics, law, medicine, nursing, occupational therapy, optometry, osteopathic medicine, pharmacy, physical therapy, physicians associate, medical imaging and radiation sciences, and veterinary medicine. Some OSU degrees allow students to transfer back up to 30 hours of professional school coursework to complete the undergraduate degree. For more information, students should consult the pre-professional advisors in the Arts & Sciences Student Success Center, 213 Life Sciences East.
The OSU Speech-Language-Hearing Clinic is located in Murray Hall on the OSU campus. Fees are charged for services with special rates provided for all OSU students, faculty, and staff. A sliding fee scale for services insures that individuals are served regardless of their ability to pay. To schedule an appointment please call 405.744.6021.

Study Abroad

OSU students can add an international dimension to their education through study abroad.

• Reciprocal Exchanges. Students may earn OSU credit through reciprocal exchanges to over 35 countries. Students stay in their home country and live with host families. Fees are determined on a sliding fee scale based on income and family size.

• OSU Faculty-led Programs. Students may also earn OSU credit by enrolling in short-term international courses offered by OSU college outreach units in countries such as China, Ecuador, France, Greece, Italy, Mexico, Peru and South Africa.

• Affiliated/Approved Programs. Students may earn transfer credit through participation in pre-approved study abroad programs offered by other U.S. universities or study abroad program providers. Students on affiliated programs pay fees directly to the provider.

• Internship and Volunteer/Service Programs. Students may also participate in non-credit work, internships and volunteer/service learning opportunities abroad. These programs are offered as short-term experiences or semester-long immersion, often combined with academic study in the host country.

Most exchanges and longer term study abroad programs require successful completion of at least 45 credit hours and good academic standing. Application deadlines for priority consideration for both fall and spring semester reciprocal exchanges, many fall semester study abroad programs and short-term international courses are at the end of January or the beginning of February. Deadlines for long-term spring study abroad programs are usually in early summer.

Financial assistance is available for many programs through scholarships as well as federal and state loans. In many cases students may use federal financial aid to offset the cost of an academic program abroad. Students may apply for International Studies & Outreach Scholarships such as the Provost’s Study Abroad Scholarship or the Humphreys Study Abroad Scholarship through the Study Abroad Office to support their credit-bearing activities abroad. There are two application cycles each year. ISAO Awards are based on financial need and award amounts vary. Other scholarships for study abroad are also available. Information on these national and local scholarships is available at https://abroad.okstate.edu/outgoing/funding or through the Study Abroad/NSSE office, 242 Student Union, 405.744.8569. OSU colleges also offer numerous scholarships for study abroad. For example, outstanding OSU undergraduates and graduates may apply for the Bailey Family Memorial Trust Scholarship for study abroad in the humanities. Information and applications are available at the College of Arts and Sciences Student Academic Services Office, 213 Life Sciences East. The Department of Foreign Languages and Literatures, 309 Gundersen Hall, offers several scholarships for language study abroad. Individual colleges also offer scholarships for their short-term faculty-led programs. For more information on studying, working, teaching or volunteering abroad contact the Study Abroad/NSSE office, 242 Student Union, e-mail abroad@okstate.edu or visit the website https://abroadprograms.okstate.edu.

The Center for Family Resilience (CFR)

Michael Merton, PhD — Associate Professor and Director

The Center for Family Resilience (CFR) is an initiative of Oklahoma State University’s College of Human Sciences, Cooperative Extension Services, and the OSU-Tulsa campus. The vision of the CFR is that every family be fully equipped to support members in achieving their full personal and social potential.

Located on the Tulsa Campus, the mission of the CFR is to build family resilience in Tulsa, Oklahoma and across the nation through innovative research on everyday issues affecting families, and by translating research results into effective programmatic or policy solutions. The CFR’s mission is implemented through three main programs. The community engagement program builds bridges among community agencies, family and social service providers, and CFR affiliate researchers. The research program coordinates the activities of affiliate researchers to create knowledge of individual and family resilience, and the factors shaping resilience. The translation and education program emphasizes dissemination of acquired knowledge and the transfer of that knowledge to everyday professional practice.

The Center for Family Services

Matt Brosi, PhD — Associate Professor and Center for Family Services Director

The Center for Family Services is sponsored by the Department of Human Development and Family Science in the College of Human Sciences.

The Center’s dual mission is to provide high-quality, low-cost marital and family therapy services to the public and to provide a high-quality training environment for master’s degree students specializing in marriage and family therapy. Because the Center for Family Services is a training facility, charge is lower for graduate students in marriage and family therapy conduct the majority of the therapy. While conducting therapy, therapists-in-training are under the direct supervision of clinical faculty members. The Center allows for video recording of sessions for feedback and observation of sessions by clinical supervisors. The Center for Family Services is open to individuals, couples or families seeking help with personal or relationship issues. Presenting issues may include marital concerns, family violence, adjustment to divorce or other life changing events, child behavior problems, parenting concerns, anxiety and depression, and family reunification. Fees are determined on a sliding fee scale based on income and family size.

Appointments are available on request. While appointments are available during daytime and evening hours, most appointments are scheduled on Wednesday and Thursday evenings.

The marriage and family therapy program is sponsored by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy.

The Center for Hospitality and Tourism Research

Hailin Qu, PhD — Regents Professor, William E. Davis Distinguished Chair and Director; The OSU Center for Hospitality and Tourism Research

The OSU Center for Hospitality and Tourism Research (CHTR) is the School of Hotel and Restaurant Administration is dedicated to hospitality and tourism research and supports all areas of inquiry that directly and indirectly affect hospitality and tourism operations and management. The Center links cutting-edge research with the critical needs and demands of the global hospitality and tourism industry. Through collaborative efforts between the university, the Oklahoma Tourism and Recreation Department and hospitality industry, the CHTR supports research, instruction, and extension/outreach activities essential to faculty scholarly development, student learning, industry practice and local community development. The CHTR positions the School of Hotel and Restaurant Administration as the premier provider of hospitality and tourism research excellence. For more information, visit humanities.okstate.edu/chtr/.

Writing Center

Since 1976, members of the Oklahoma State University community—students, faculty and staff—have found writing support from the consultants at the Oklahoma State University Writing Center. The OSU Writing Center aims to create well-developed and effective communicators regardless of skill level or background. Writing Center consultants help writers understand and practice many useful strategies—from brainstorming to drafting to editing techniques.

Appointments for the OSU Writing Center in 440 Student Union are made online at osuwritingcenter.okstate.edu. The Writing Center provides drop-in consultations the Edmond Library, the Spears School of Business Student Success Center, and the CASNR Student Success Center in Agricultural Hall. Check the Writing Center website for appointment times and availability. Writers may also ask quick writing questions by calling the Writer’s Hotline at 405.744.6671, chatting with Pencil Pete on the Writing Center website, or directing questions to writingcenter@okstate.edu.

Special Facilities

Bartlett Center for the Visual Arts and the Gardiner Gallery

The Bartlett Center, formerly known as Gardiner Hall, was built in 1910 as a women’s residence hall and has since served as a classroom building for women’s physical education, speech, agriculture extension and the College of Business Administration. The building was originally named to recognize Maude Gardiner, founder of the University’s home economics program. Gardiner Hall was renamed the Bartlett Center in 1984, when Mr. and Mrs. F.M. “Pete” Bartlett made a generous gift to Oklahoma State University that was designated for renovation of the building then occupied by the Department of Art.

The Bartlett Center renovation has enhanced the capabilities for instruction in the visual arts at OSU. It has also provided an environment for activities that have brought regional and national recognition to the visual arts at OSU. The Department of Art has ten instruction studios in the Bartlett Center, including three computer laboratories, and a 100-seat auditorium for instruction in art history. This auditorium is equipped with state-of-the-art multimedia equipment. Additional studios for sculpture, ceramics, printmaking and 3D design are in the Visual Arts Annex located on the northwest corner of campus. These new 2016-2017 University Catalog
facilities provide students with well-equipped studio environments designed with health and safety as paramount.

Maudie Gardiner continues to be recognized through the Gardiner Gallery, a significant part of the Bartlett Center serving both instructional and outreach needs of the Department of Art. Gallery programming provides exhibitions of regional and national importance to OSU and the community and opportunities for students to learn about installation and display of their work. Exhibitions have included the work of Manuel Neri, Jody Servon, Lucas Samaras, and traveling exhibitions such as “Across the Divide: A Collection of Eighteen Chinese-American Artists” and “Kaleidoscope USA.” Faculty and student work is also exhibited on a regular basis with an annual juried exhibition for students held each Spring. For current information about the Gardiner Gallery exhibitions and hours visit the gallery on the following social media platforms: art.okstate.edu, facebook.com/gardinergallery.

The Biology Learning Resources Center
The LRC, which serves as a study area for life science students, especially those taking the introductory biology course. Here students may use computer tutorials, review sample tests and papers, examine experiments, or meet with a Teaching Assistant or study group. The LRC is located on the third floor of Life Sciences West and is maintained by the Department of Integrative Biology.

Collection of Vertebrates
The OSU Collection of Vertebrates (COV) is housed in Life Science West and maintained by the Department of Integrative Biology. It includes specimens over 120 years old and consists of collections of fishes, amphibians, reptiles, birds, mammals, and frozen tissues. The Collection of Fishes maintains more than 30,000 lots of specimens, mostly from Oklahoma and other Plains states, but also includes one of the world’s largest collections of rare Nepalese fish. The Collection of Amphibians and Reptiles includes approximately 12,000 specimens and houses among the largest collections of the rare Oklahoma salamander and the grotto salamander. The Collection of birds houses 2,500 skins, are from Oklahoma and includes the oldest specimens that date from the 1880’s. The first mammal catalogued into the Collection dates from 1924 and now includes more than 13,000 specimens from every county in Oklahoma, all 50 states, and 50 other countries; every continent except Antarctica. The Collection is one of the most taxonomically diverse collections at any university in the U.S. Among the most significant components of the Collection of Mammals are the more than 1,000 specimens from Ethiopia. All specimens are valuable for their use in teaching classrooms and for research.

Department of Design, Housing and Merchandising
Design, Housing and Merchandising has a long tradition of incorporating laboratories that realistically simulate industry environments into teaching. Teaching labs include the Sewn Products Production Lab, the Sewn Products Evaluation Lab. Equipment in these labs include: Twining-Alberts tensile testing machine; pilling tester machine; air vapor hood; wear testing equipment; heavy-duty industrial sewing machines; ultrasonic welder; sweating guarded hot plate; Kawabata Evaluation System (KES); thickness gauges; and spectrophotometer, cutting tables, pressing stations, industrial sewing machines, and an ultrasonic welder. Product development is enhanced with current digital industry technologies including AccuMark pattern design system (PDS), Gerber Technology – automated cutter, pattern digitizer, AccuMark V-Stitcher 3-D pattern visualization software, a laminating heat press oven, Infinity plotter, and various other sewn product production and care equipment.

Design, Housing and Merchandising also employs laboratories for the conduct of research. A mixed reality immersive design environment area incorporates technologies such as virtual reality (VR), augmented reality (AR), and 3D digital prototyping. Equipment includes: a Passive 3D visualization system, Mirametrix S2 passive eye tracking system, Oculus Rift devices, software and hardware for AR visualization, the Vuzix Star XLD 1200 system, multiple mobile tablet devices, a mobile 3D scanning system, an Ultimaker 3D printer and Emotive Neuroimaging Devices.

An ergonomics area focuses on understanding the physical and cognitive capabilities and limitations of different populations under various conditions. Equipment in this area includes: Vitas SMART 3-D body scanner, Polyworks (V10) software, 8-camera Motion Capture System (BTS Bioengineering), surface electromyography equipment, Treadmill, Tekscan pressure sensors, anthropometers, skin & core temperature measurement devices, heart rate monitors, Philip’s Actigraph Spectrum watches and related equipment.

The XRF lab is a controlled space where x-ray fluorescence (XRF) is used as a non-destructive means of testing objects’ chemical composition. The XRF analyzer is used to evaluate hidden heavy metals in consumer goods and address deficiencies through best practices. Assessing items and data collection are possible only after adequate training and protocol compliance. For more information on DHM laboratories and equipment, contact the Department of Design, Housing and Merchandising, 449 Human Sciences.

Department of Wellness : Building America's Healthiest Campus® one Cowboy at a time

The Department of Wellness is committed to creating a healthy campus culture for students and employees. The Department thrives on the motto “Discover Wellness” with a mission to provide education, engagement, and excellence through programs, services, and facilities

Department of Wellness Programs

- Group Fitness - offers a variety of fitness programs and classes in three locations with multiple formats at every skill level. There are more than 100 classes offered including yoga, zumba, kickboxing, water aerobics, kickboxing, martial arts, TRX, abs, boot camp and more. Classes are offered at the Colvin Recreation Center, Seretean Wellness Center and Student Union.

- Intramural Sports - serves more than 3,500 participants weekly in more than 50 sporting activities yearly. Intramural Sports at OSU promotes its rich tradition of friendly, competitive activities and serves as a rallying point for socialization, exercise and competition.

- Outdoor Adventure - provides opportunities for fun, adventure, education and recreation. Through trip and workshop programs Outdoor Adventure emphasizes environmental awareness, personal development, safety training, wilderness travel and fun. With a variety of regional and national trips as well as workshops at all skill levels, staff members strive to provide opportunities for the whole community. In conjunction with trips and workshops, Outdoor Adventure offers an extensive low and high elements challenge course at Camp Redlands and a state-of-the-art indoor climbing facility at the Colvin Recreation Center. To support courses and the local community, the outdoor equipment rental shop, necessity the climbing challenge course, provides access to everything from tug-of-war ropes to sleeping bags.

- Sport Clubs - recognized OSU student organizations designed to promote a non-varsity sport or recreational activity. Generally, a sport club program provides three basic opportunities to its clientele: instruction, recreation and competition. Clubs differ in scope and purpose as some are very social. Others compete throughout the region or country.

- Sponsored Programs - consist of federal, state and primarily funded grants and contracts that serve the OSU community as well as fulfill the community outreach and extension components of Oklahoma State University’s land-grant mission. Oklahoma ABLE Tech is the statewide Assistive Technology Act Program, which connects Oklahomans with disabilities to assistive technology, or AT, through a variety of programs and services. ABLE Tech provides access to AT through a short-term equipment loan program, AT demonstration centers, re-utilization of AT through the Oklahoma Equipment Exchange, and low interest bank loans for AT. The Oklahoma Durable Medical Equipment Reuse Program is a partnership between the Oklahoma Health Care Authority and Oklahoma ABLE Tech to reuse and re-distribute valuable durable medical equipment to Oklahomans. The Special Education Resolution Center program, through a contract with the Oklahoma State Department of Education, manages the federal special education due process hearing and alternative dispute resolution programs for Oklahoma. The Department of Wellness Prevention Programs consists of seven grant-funded programs which include: regional prevention coordinators, Strategic Prevention Framework State Incentive Grants, Communities of Excellence, Tobacco Control programs and a federally funded Drug-Free Communities grant.

Wellness Services

- Personal Training - exercise programs tailored by trainers to fit clients’ needs. Trainers teach clients proper technique to perform exercises correctly and effectively.

- Massage Therapy - uses relaxing techniques to help the body transcend into an overall sense of well-being.

- Nutrition Counseling – examines individual eating habits and their relationships to health and disease. Nutrition counseling is available to OSU students, faculty and staff. A registered and licensed dietitian will assist in the development of a practical meal plan to meet individual dietary needs.

- Cooking Classes - teaches heart-healthy cooking classes. Cowboy Cooking School is a series of cooking demonstration classes offered each semester at the Seretean Wellness Center.

- Health Risk Assessments - screenings that provide an individualized student health risk assessment designed for early detection of health problems.

- Pilates Reformers Training – low impact workout that develops core strength, improves performance and prevents injuries.

- Employee Assistance Program – is a confidential resource for faculty, staff and their families who are experiencing personal difficulties. Developed to improve well-being, the service is provided free to employees (75% FTE and above) and their dependents.

Wellness Facilities

- Colvin Recreation Center - offers 250,000 square feet of recreation options including: 10 basketball courts, 5 racquetball courts, 1 squash court, rock
climbing, wall, indoor track, 2 cardio theaters, a multipurpose gym, indoor pool, outdoor pool, 2 dance studios, 3 multipurpose fitness rooms, a performance studio, a personal training area, performance studio, spin studio, selectorized weights, free weights, putting green and 2 golf simulators.

- The Seretean Wellness Center - features a newly renovated fitness center including a cardio lounge, 2 group exercise studios, multipurpose room, personal training area, massage therapy, Pilates Reforme’s, health risk assessment room, demonstration kitchen, nutrition counseling, a lecture hall and Sponsored Program testing and training center.

- The Allen An icon of another great attribute to the Department of Wellness featuring 4 basketball/volleyball courts. With the inclusion of natural light and air conditioning, it serves as the perfect location for small conferences and workshops.

- The Medlands - available through Outdoor Adventure. It is located 10.5 miles from the OSU campus featuring 12 cabins, a lodge, pavilion, swimming dock, picnic area, and a challenge course. This facility offers trainings and team building workshops to students, faculty, staff and general public.

The Department of Wellness aims to provide exciting and rewarding programs and services for OSU students and employees. For more information visit our website at http://wellness.okstate.edu/, like us on Facebook at facebook.com/OSU WELL and follow us on Twitter, Instagram and Snapchat @ OSU WELL.

Ecotoxicology and Water Quality Research Laboratory (EWQRL)

The Ecotoxicology and Water Quality Research Laboratory (EWQRL) is located in Life Sciences West and is part of the Integrative Biology Department at OSU. Established in 2000 in the Reservoir Research Center, in 2001, the lab changed names to reflect not only our expertise in standardized aquatic toxicity testing but also additional research foci in aquatic ecosystem assessments. The EWQRL provides services to a number of companies and wastewater treatment facilities throughout Oklahoma, in the form of EPA standardized bioassays. In addition, the staff and students (both graduate and undergraduate) funded by the EWQRL, undertake aquatic monitoring projects in riverine, wetland and reservoir systems for both state and federal agencies. These projects include invertebrate and fish surveys and identification, zebra mussel monitoring, wetland delineation and toxicity assessments. The labs facilities include a fathead minnow rearing room, temperature and light controlled environmental chambers for in-house cultures of aquatic test organisms (cladocerans, amphipods and midges) and standard toxic testing of client produced water, a wet chemistry laboratory, computer laboratory, and numerous compound and dissecting microscopes all with digital imaging capabilities. Sampling equipment for field surveys includes a boat, electroshockers, nets, drift fences and several field meters.

Engagement Skills Trainer (EST 2000)

The EST provides initial and sustainment marksmanship training, static unit collective gunnery and tactical training, and shoot/don’t shoot training. It supports the following three modes of training: marksmanship, squad/fire team collective and judgmental use of force. The system models M4/M16A2 rifles and is all EST training scenarios and U.S. Army Training and Doctrine Command (TRADOC) validated. Cadets at OSU will spend up to six to nine hours per semester using the EST, focused on grouping, zeroing, basic qualification, and advanced marksmanship techniques. The system represents the cutting edge of technology in marksmanship training across the globe.

OSU Herbarium

Dr. Mark Fishbein, Director

The OSU Herbarium houses the university’s collection of plant specimens. It is located in Life Sciences East, Room 012, and is maintained by the Department of Plant Biology, Ecology and Evolution. The collection consists primarily of over 150,000 specimens of vascular and non-vascular plants that are dried, mounted large-scale productions are presented in the 600 seat Vieva Locke Theatre. Two to four experimental productions, often student-directed and developed, are presented each spring. The EST provides initial and sustainment marksmanship training, static unit collective gunnery and tactical training, and shoot/don’t shoot training. It supports the following three modes of training: marksmanship, squad/fire team collective and judgmental use of force. The system models M4/M16A2 rifles and is all EST training scenarios and U.S. Army Training and Doctrine Command (TRADOC) validated. Cadets at OSU will spend up to six to nine hours per semester using the EST, focused on grouping, zeroing, basic qualification, and advanced marksmanship techniques. The system represents the cutting edge of technology in marksmanship training across the globe. The system models M4/M16A2 rifles and is all EST training scenarios and U.S. Army Training and Doctrine Command (TRADOC) validated. Cadets at OSU will spend up to six to nine hours per semester using the EST, focused on grouping, zeroing, basic qualification, and advanced marksmanship techniques. The system represents the cutting edge of technology in marksmanship training across the globe.

OSU Libraries

The OSU Library system consists of the Edmon Low Library at the heart of campus and three specialized branch libraries (the Education and Teaching Library in Willard, the Architecture Library in the Architecture Building, and the Veterinary Health Sciences Library in McKelvy Hall). The Edmon Low Library is open 24 hours/5 days per week during the fall and spring semesters and has limited hours on Saturdays and Sundays. The Library’s six floors offer individual study spaces designated as either silent (no talking) or quiet (talking softly permitted) or groups. There are 12 private group study rooms that can be reserved online. Desktop computers located on the first and fifth floors provide access to the Internet, MS Office, BOSS (a search system of all Library resources) and other electronic library resources. The Library also provides laptops, MacBook Pros and Microsoft Surfaces as well as audio recorder, digital video and still cameras and phone chargers for checkout.

Many Library resources are available remotely 24/7 via the Library’s website (www.library.okstate.edu). Here you may renew books you have checked out or determine whether a book you need is available for checkout; search the A to Z listing of more than 200 specialized online databases; connect to more than 60,000 online full-text journals; and access online course reserves. If there is an article or book chapter the Library owns only in print, you may request it through Document Delivery Service to request a link to a digitize copy. If you need an item not owned by the OSU Library, the Interlibrary Loan Service can secure it for you.

The Library offers assistance in person, by phone 405-744-9775 or text message 405-592-4128, via e-mail lib-diss@okstate.edu or via chat on the Library’s website. Throughout the semester, the Library offers free tours and training sessions. Students can also enroll in LBSC 1011, a one hour credit course using Library resources. For the latest Library news, events and service updates, find OKStateLibrary on Facebook, Twitter, Instagram or OSU.TV.

Archives. OSU’s Archives focus on the history of OSU and the state. Rare books, manuscripts, photographs and research material related to Oklahoma women, history, politics, business and natural resources have been acquired. The Archives is also the depository for all academic and administrative documents, official records and other materials related to the management, operations and mission of Oklahoma State University.

Government Documents. The OSU Library has an extensive collection of current and historical government publications, as well as publications of the state of Oklahoma, foreign governments, and international organizations providing information relevant to all majors. Publications include statistical, government, and legal materials. Government Documents also includes the Patent and Trademark Resource Center.

Oklahoma Oral History Research Program. The OOhRP promotes and facilitates the collection, preservation and analysis of interview-based research and related audio projects by educating students, faculty and community members in the methods, protocols and professional and ethical standards of oral history. The OOhRP’s extensive interview collections focusing on Oklahoma history and culture are available online for research use.

Research and Learning Services. RLS helps you find and use information better, faster and easier. The department partners user experience, like workshops, tours, awards and professional and ethical standards and technical standards. RLS provides access to library resources, such as data management support, copyright and citation education and research instruction. Services are open to everyone and are free, convenient and customizable.
The Cleo L. Craig Child Development Laboratory-RISE

The Department of Human Development and Family Science has a rich tradition of excellence in early childhood education. The Child Development Lab-Rise Program was established in 1924 with the inclusion of RISE School of Stillwater in 2010. The laboratory presently resides in a facility opened in 1983 and renovated in 2010. The program serves as a field placement for early childhood education majors. Equipped with observation booths, the Child Development Laboratory-RISE is also used as a site for observation and interpretation of human growth and development by students in courses throughout the university. Research on developmentally appropriate practice, children’s learning and development, and the preparation of teachers is conducted in the facility. The Child Development Laboratory-RISE is licensed by the Department of Human Services and is accredited by the National Association for the Education of Young Children. The program offers planned learning activities that are developmentally appropriate and designed to model best developmental practices; frequent and positive interactions between children and students; nutritious meals and snacks; regular communication with parents; positive guidance techniques; high teacher-child ratios; experienced Early Childhood Education degreed staff; and on-going systematic programming.

The program provides the highest quality of early childhood education to children with and without developmental disabilities by providing exemplary services based on recommended practices to young children with diverse abilities and their families. The Child Development Laboratory-RISE provides family-centered services designed to meet the individualized needs of all children and families; offers a blend of educational and therapy services within the context of a developmentally appropriate curriculum; and prepares children for their next educational environment.

Subject to availability, families have the opportunity to enroll in this model early childhood program. Children enrolled in the program range in age from 12 months through six years of age.

The OSU Museum of Art

The OSU Museum of Art in downtown Stillwater serves as a home to Oklahoma State University’s permanent art collection and as a teaching museum for students, providing hands on opportunities to learn while connecting students with a broader arts community beyond the OSU campus. The museum offers a variety of diverse exhibitions and programs year-round, all available at no cost to visitors.

Located in the former Stillwater Post Office, this renovated 1933 WPA building provides a creative and symbolic setting for transformative and engaging art experiences. Admission is free for everyone and the museum is open from Tuesday through Saturday from 11 am to 4 pm.

The School of Hotel and Restaurant Administration

Experiential Learning Laboratories

Taylor’s Teaching Restaurant is an experiential laboratory that emphasizes quality food service utilizing a thoughtfully prepared menu featuring seasonal ingredients. Students develop skills in food preparation, service techniques, dining room management and profitability. Focus is on professionalism, quality management and guest satisfaction.

Planet Orange Café is a quick service concept with an upbeat and dynamic atmosphere. Students progress through staged learning in this lab developing the skills to assume management responsibility.

The Hirst Center for Beverage Education promotes a curriculum at the fore-front of beverage education featuring a variety of formats including coffees, teas and other beverages.

Experiential and connectional learning opportunities are facilitated in these learning laboratories through student-led events: the Distinguished Chef Scholarship Benefit Series, Hospitality Days Career Fair, Craft Beer Forum and the Wine Forum of Oklahoma. All students are encouraged to participate in these service learning activities.

The Student Union

Dating back to 1815, college unions have always been thought of as “places where all may meet on common ground.” The OSU Student Union certainly is no exception to this tradition as it has been serving the university community since 1950 and has become the place to be on the OSU campus. With a facility consisting of more than 630,000 square feet, it stands as the most comprehensive union in the world. It provides the university with such services as the University Store (textbooks, OSU merchandise and technology center), retail shops, banking services, restaurants, lounges, meeting rooms and a 67-room hotel.

The primary purpose of the OSU Student Union is to be a comprehensive system of diverse people, services, programs and facilities that enrich the intellectual, cultural and social well-being of the OSU student and campus community.

Located in the Student Union is the Department of Leadership and Campus Life, which houses the university’s more than 500 campus organizations. Many activities such as movies, late night events and speakers are provided for students by the Union’s student programming organization, the Student Union Activities Board also located in the Union.

Through its meeting and conference center, the Student Union hosts many events throughout the year. The variety of meeting rooms located throughout the building serves based on the availability to OSU students organizations and faculty meetings, typically at no charge.

The University Store generates $17 million of the Student Union’s almost $22 million operating budget. This money supports the Union’s operations, as well as many Leadership and Campus Life programs and services, like Camp Cowboy and Late Night Café, which have impacted thousands of OSU students throughout the years.

The Student Union’s recent $63 million renovation project, which was officially endorsed by the students through their increased student fee gift, allowed the university to revitalize an iconic campus building so it can better meet contemporary student needs while maintaining the significance of its history, legacy and commitment to student success. The Union was also recently named the “No. 1 Most Amazing Student Union” by bestcollegereviews.org and ranked second by Best College Values in its most amazing college unions and campus centers in the United States rankings.

More information about the Student Union and its offerings can be found at union.okstate.edu.
Student Services

Career Services

Pamela Ehlers, Ed.D—Director

Career Services offers career-related assistance and educational programming to OSU students and alumni through a network of career services offices located in the academic colleges as well as in the Student Union and OSU Alumni Association.

Staff members assist students one-on-one in exploring academic majors, and careers; offer insight into obtaining part-time jobs through online job listings and other search strategies, host nearly a dozen specialized career fairs each year, and organize employer information sessions. Through campus recruiting students have connection opportunities with thousands of employers annually. Additionally, students receive support with other options, including campus involvement, job shadowing, leadership, and volunteer experiences to build the skills necessary for future employment.

Career developmental activities, including help in identifying a major well suited to a student’s interests, skills, abilities, and values are facilitated by Career Consultants. Job hunting, career search strategy planning, interview preparation, interview, and part-time jobs. Additional job search and preparation tools such as Interview Stream, My World Abroad, myviasjobs.com, and other job search resources and assessments are accessible through HireOSUgrads.com.

Career Services offers a number of free and discounted job search supplies to enhance students’ professional image. Examples of these include ready references that address nearly every frequently asked question pertaining to success in the job search, as well as resume, paper and thank you notes to use at career fairs and during the application process. Products like portfolios and business cards are also available at a discount for student use from the OSU Career Services office located in 360 Student Union.

Information Technology

Darlene Hightower—Chief Information Officer

Information Technology (IT) creates and manages OSU’s technology infrastructure. IT provides technology services such as email systems, software, network course management system, identity and access management (ID cards and O-Key), information security, technology support, and others. IT develops and maintains the background data systems between and among the campuses in the OSU A&M system.

Service Access. O-Key, the identity and access management system, coordinates identity properties and university roles to create unique access to technology services. O-Key is also used for setting up email preferences, emergency contacts, manage IT system passwords, and emergency alert preferences.

My.OKstate.edu Portal. The My.OKstate.edu Banner portal is a "one stop" location for accessing many university systems such as announcements, communications, financial aid, payroll, enrollment, housing, departmental information, human resources, transcripts, the Online Classroom, and more.

ID Cards. The OSU identification card is provided to each person with a formal affiliation with OSU. Card-holders use the ID card to make on-campus purchases, meal plan transactions, library checkouts, get free off-campus bus transportation, access certain events, gain access to authorized doors, and the Colvin Recreation Center.

Email. The "@okstate.edu" email address is the address used by the university for official business. Through O-Key, students select either Cowboy Mail (Microsoft Office 365) or Orange Mail (Google Mail) as their email delivery service. OSU employees use Microsoft Office 365.

Cloud Storage. Storage for digital files and documents is handled through the storage provided by Microsoft 365 (Cowboy Mail), or Google (Orange Mail). Storage on both systems is available to students even though email is delivered through just one system. OSU employees may have additional storage through their departments through the common group drives.

Network. Network services include the wired and wireless network and telephone services on campus. Wireless coverage of the Stillwater campus can be found at wireless.okstate.edu. Signing into the OSUSTUDENT or OSUSTAFF requires active O-Key credentials. Access is based on enrollment status for students or confirmation of employment for staff.

Remote Network Access. Authorized persons can use the Virtual Private Network (VPN) to get a secure encrypted connection to OSU’s internal network. VPN provides secure connections to any authorized on-campus resource over the Internet from off campus.

Software Distribution. Information Technology contracts with several companies to provide a variety of software to the OSU community. Availability is dependent on receipt of a contract or a signed agreement with the university. The full Microsoft Office is available to students, faculty, and staff. Other offerings may include math and statistical software, assistive technology, design software, and more. Access to the software is at the Software Distribution Center at sdc.okstate.edu.

Computer Labs (IT). The four IT computer labs include desktop computers, printers, scanners, standard software suites, and specialized software.

Instructors can reserve selected labs for classroom use. Printing is available at no charge. Lab locations and hours can be found at labs.okstate.edu.

Students can use the Virtual Labs - an online version of the IT labs.

Remote Printing. Remote printing is a service that allows users to send electronic documents to a server that holds the file(s) for up to six hours. The user can pick up the document by going to the selected print station. Print stations are located in the Student Union, all IT computer labs, and various sites in Residential Life.

Learning Technologies. OSU’s course management system, BrightSpace by D2L, is the cloud version of Desire2Learn (D2L). As of the fall of 2016, users will get to the Online Classroom by going through the Banner portal at my.okstate.edu. Most instructors use this online software to post course materials. In the Online Classroom, instructors may use other tools such as Respondus Lockdown Browser to restrict students’ access to other sites and chats while taking tests. Turnitin is a tool that reviews electronic documents for plagiarism. Clickers, or Audience Response Solutions, is a technology for enhancing active learning in the classroom.

IT Helpdesk. The OSU-IT Helpdesk provides free tech support to the OSU community. Helpdesk staff troubleshoot computer-related issues and gives desk-side support to many offices on campus. They are available by phone (405-744-4357), email (helpdesk@okstate.edu), or face-to-face service (113 My.OKState) during regular business hours. Find more information visit us at help.okstate.edu.

Parking and Transportation Services

Steve Spradling—Director of Parking and Transportation Services

Jan Herandez—Manager, Parking and OrangeRide Bicycle Rental and Repair

Tom Duncan—Manager, Transportation Services

Vehicle Registration and Parking Regulations. Any motor vehicle parked on University property between the hours of 5:00 am and 5:00 pm, Monday through Friday, must display a valid OSU paid parking permit or pass. The color and type of permit indicates the area where the vehicle may be parked. Use of a motor vehicle on University property is a privilege, not a right, and is made available only under the policies established in the University Parking and Traffic Regulations manual currently in effect. Any vehicle driven or parked on the campus of the University by an OSU student or employee should be registered with the OSU Parking Services.

The purpose of these regulations is to expedite the safe and orderly conduct of University business and to provide parking facilities in support of that function within the limits of available spaces. Purchase your permit online at www.parking.okstate.edu; new faculty or staff, vendor, handicap, university vehicle, carpooling, retiree, construction, registration or special permits must be purchased in person at the Parking and Transportation Services office. A copy of the OSU Parking Rules and Regulations booklet is available from the Parking Services office, 1006 West Hall of Fame on the corner of Monroe and Hall of Fame; or view online at www.parking.okstate.edu.

Bicycle registration with the OSU Department of Parking and Transportation Services is advantageous in the event the bicycle is stolen or lost. When bicycles are recovered by the department they are checked against bicycle serial numbers maintained in the registration files for return of the bicycle to the rightful owner. Permits are free of charge and can be obtained in-house or online (applying fees will apply). Prior to obtaining a permit you are required to review safety guidelines before registering your bicycle. You can view the tutorial, and take the quiz online at bikeinfo.stafford.okstate.edu/Training/BicycleSafety/default.aspx.

OrangeRide Bicycle Rental and Repair. OrangeRide is a bicycle rental program being offered to promote affordable and convenient transportation to the campus and Stillwater community. The shop, which is located on the west...
end of the Multi-Modal Terminal, will be open Monday-Friday 8am-5pm offering rentals on a daily, weekly, or by semester basis. In addition to bicycle rental, the shop will also provide basic bicycle repair for personally owned bicycles. (405) 744-BIKE www.facebook.com/OSUorangerie

Transit Services. The BUS is the campus and community transit service operated by the Department of Parking and Transportation Services. The BUS offers fixed route transit and on-demand paratransit service year-round. Bus transportation is available from 6:30 am until 10:30 pm Monday through Friday during the school year and 6:30 am until 7:00 pm during the summer. Route and time information is available at the Parking and Transit Services office or online at www.transit.okstate.edu.

The BUS also offers an online bus tracking system at www.thebus.okstate.edu. If you can select a route and identify where the buses are on route in relation to your location, available on your desktop and mobile device (Android and iPhone apps).

Tulsa Shuttle, BOB, OSU’s Big Orange Bus, is a shuttle service between the Stillwater and Tulsa campuses. There are nine trips daily from each campus Monday - Thursday; seven trips on Friday. It is open to current students, staff and faculty and is now open to the public. The cost is $7.50 one way for students; and $13 one way for faculty/staff and public. Reservations can be made online at shuttle.okstate.edu by logging in with your OKKEY account or stop by the Shuttle office in Stillwater at 1006 West Hall of Fame, at the corner of Hall of Fame and Monroe, Monday - Friday 8:00 am to 5:00 pm, or Tulsa at the North Hall Information Center, Monday - Thursday from 7:00 am to 6:00 pm and Friday from 7:00 am to 5:00 pm. In Stillwater, call 405.744.7100 or in Tulsa call 918.594.8332 or visit shuttle.okstate.edu/Schedules/index for the shuttle schedule. Jefferson Lines connects to thousands of destinations in the USA, Canada and Mexico. Tickets may be purchased at the Multimodal Transportation Terminal at 1006 West Hall of Fame, by phone at 405.744.7100 or online at www.jeffersonlines.com.

Housing and Residential Life
Leon McClintock, Jr., Ph.D.—Director of Residential Life
Shannon Baughman—Associate Director of Operations: Conferences, Facilities, and Marketing
Elizabeth Carver-Cyr—Assistant Director, Family and Graduate Student Housing
Delton Gordon—Assistant Director, Residential Life
Jon Hunt—Assistant Director, Administrative & Business Services
Marcy Louis—Assistant Director, Residential Life
Tanya Massey—Assistant Director, Programs and Development

The Department of Housing and Residential Life offers 32 residence halls, six family-first neighborhoods, several special interest housing options, and countless leadership activities for students. Students who live on campus graduate sooner and maintain higher grades than their off-campus counterparts. More than 500 students are involved in planning and leading educational, recreational, and social activities within the halls.

Freshmen are required to live in campus approved housing. Students are expected to comply with this University policy. Students who are required to live on campus will automatically be billed and assessed if they fail to submit a housing contract. Subject to verification and authorization by the university, students will be given permission to live off campus provided any one of the exemption categories listed is satisfied:

- A student is residing and continues to reside in the established primary residence of her/his parents (or legal guardian) if it is within a 30-mile radius of OSU. The parents must have established their primary residency at least six months prior to the request for an exemption. Legal guardianship must have been established by the court of law at least one year prior to a request for an exemption in order to be considered. Click to download a copy of the Sworn Statement of Commuter Status Form;
- A student is married or has dependent children living with the student;
- A student is 21 years of age or older on or before the first day of classes of the initial semester of enrollment;
- A student has successfully completed 28 or more hours of academic credit prior to the student’s enrollment or re-enrollment. Credit earned by exam (Advanced Placement, CLEP, ACT, SAT) and hours received from concurrent high school credit are not considered.
- A student has performed in active military service, as verified by a discharge certificate (DD214);
- A student presents sufficient evidence of an extreme medical condition, as documented by her/his treating physician for which on-campus accommodations cannot be made. Click here to download a copy of the Medical Hardship form;
- A student presents sufficient evidence of an extreme financial hardship condition based on similar guidelines as for Financial Aid. Click here to download a copy of the Financial Hardship form;
- A student presents sufficient and satisfactory evidence of extreme or unusual hardship that will be intensified by living in the residence halls. All accommodations are rented on a contract date priority basis. While there is no deadline to apply for housing, prospective students are encouraged to return their applications and contracts at least nine months before the desired occupancy. This will improve the chances of receiving the preferred on-campus housing location.

Traditional Halls, Suites and Apartments. OSU offers four living styles to choose from when picking a place to live: traditional halls, modified traditional halls, suites, and apartments offer a variety of living accommodations.

Traditional residence halls include Drummond, Iba, Parker, Stout, and Wentz Halls. The newest addition to campus is University Commons—three modified traditional buildings offering housing for women in University Commons North, and co-ed housing in University Commons South and University Commons West. Six suite buildings make up the area referred to as The Village. Suite units are also offered in Bennett, Allen, Booker, Jones, Patchin, Stinchcomb, and Zink Halls. Apartments can be found in Bost, Carreker East, Carreker West, Davis, Kim, Morsani-Smith, Payne-Ellis, Peterson-Friend, Stilton, and Young Halls.

All halls are open continuously throughout the academic year. Year round housing (9-month academic contract plus a summer contract) is available as well.

Studies show that living on campus can be more affordable than living off campus. Some students save as much as $500 per academic year by living on campus. Just one bill pays for a student’s rent, meal plan, and all utilities including cable TV and Internet connection. Rates rarely increase during the academic year, even when roommate(s) move out.

Students are offered several lifestyle options. University Commons North houses women only. All other halls are co-ed. Residential Life offers numerous Living Learning Programs for students to consider when choosing their housing options. The LLPs are developed as partnerships and provide housing, programming, and faculty interactions based on major or area of interest. A complete list of all Living Learning Programs may be found at www.reslife.okstate.edu.

In every residence hall there is a well-trained, professional staff member to coordinate the day-to-day operations of the building, as well as student staff whose primary function is to see that students benefit educationally from their residential living experience. Each floor or wing has a live-in student staff member, the Community Mentor, who is responsible for assisting and guiding the residents. Staff student members are undergraduate students specially trained in all aspects of residential area living with the experience and knowledge to answer questions and act as an advisor for student governments and programs.

Family and Graduate Student Housing
Almost 600 apartments are available to serve students in the following priority: families, single graduate students, and single, upper class, undergraduate students. Priority is given to those single students who have lived in the residence halls.

Apartments are two-bedroom units with optional furnishings. The apartments have sidewalks, off-street parking, play areas, and two community laundry facilities.

School bus transportation is provided to the Stillwater High, Junior High, and Middle schools, and to Westwood and Will Rogers elementary schools.

The Family Resource Center, located in the Family and Graduate Student Housing area, offers a variety of programs to meet the needs of the residents. These programs vary depending upon the needs of the clientele. Typical programs include: English as a Second Language class (ESL), after-school programs, children’s programs, as well as cultural and social gatherings.

Family and Graduate Student Housing provide an on-site staff member, an Apartment Assistant (AA), who is readily available to the residents. Each AA has responsibility for about 90 apartments. The AA’s duties include helping residents resolve 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 AA can be a very helpful person for all residents.

To read more about the types of housing offered, compare options and rental rates, and take a 360 degree virtual tour, please visit the website at www.reslife.okstate.edu. For further information or questions, please contact the OSU Housing and Residential Life Office, Iba Hall, Stillwater, OK 74078, 405.744.5592.

Mobility Impaired Student Housing
All types of residence halls and many Family and Graduate Student apartments offer some housing for students who have impaired mobility. Upon notification, the Department of Housing Residential Life routinely modifies rooms and apartments to meet an individual’s special needs. This modification may take several months, so advance notification is critical.

Residence Hall Student 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.

All residence halls on campus combine to form the Residence Halls Association (RHA). The RHA and Residence Halls Association acts as the voice of residential area students to the University administration concerning policies and regulations, and coordinates campus-wide activities for the enrichment of residential area living. 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 halls, such as floor officer, social committees, food committees, and sports and athletic activities.

The Activate! Leadership Program is designed to provide incoming students the opportunity to learn about leadership opportunities in the residence halls. To date over 700 students have participated in this leadership development program.

**Students With Children**

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

- Family Resource Center, 719 N. Walnut, 405.744.6539

**University Counseling Services**

University Counseling Services (UDS) offers more than 30 dining options at the Oklahoma State University campus. UDS makes every effort to provide options to satisfy the hungriest student, the most selective eater, and those who prefer vegetarian options or have limited diets. The choices are endless, with something available from early morning to late night. From national franchises and specialty restaurants to convenience stores with freshly-made grab and go options, UDS provides students with the very best offerings.

UDS also realizes how important it is to provide healthy options for its customers. These options include vegetarian and vegan choices, organic options, and farm fresh produce. UDS is also proud to be a partner with the Seretean Wellness Center in the Choose Orange program, which follows the U.S. Dietary Guidelines for Americans. The Choose Orange logo on an item signifies that it’s a healthy choice. Look for it at UDS outlets across campus.

All freshmen living on campus are required to have a meal plan. Meal plans can signify that it’s a healthy choice. Look for it at UDS outlets across campus. All freshmen living on campus are required to have a meal plan. Meal plans can vary depending on the student’s preferences and dietary restrictions.

To learn more about everything UDS has to offer, please visit dining.okstate.edu.

**University Counseling Services**

Trevor Richardson, PhD—Interim Director
Dylan Burns, PhD—Senior Clinical Counselor
Carol Challenger, PhD—Senior Clinical Counselor
Joseph Dunigan, PhD—Senior Clinical Counselor
Joni Hays, PhD—Coordinator, Reboot Center
Aviva Khiatani, PhD—Clinical Social Worker
E. David Kuekes, MD—Psychiatrist
Diana Littlefield, MS—Substance Abuse Counselor
Kara Niccum, MS—Substance Abuse Counselor
Tamara Richardson, PhD—Senior Clinical Counselor/Training Director
Veronica Sutton, MS— Outreach Specialist
Cindy Washington, MS—Clinical Counselor
Anne Weese, PhD—Senior Clinical Counselor

The University Counseling Services provides, through the Student Counseling Center—confidential, professional, personal, and career counseling for OSU students. Both individual and group counseling is available. Assistance is offered for emotional problems, as they affect personal and academic goals, intellectual functioning or relationships with others. Among the variety of concerns dealt with in counseling are stress, anxiety, depression, eating disorders, substance use/abuse, interpersonal relationships, and career indecision. Psychiatric consultation is available as needed.

University Counseling Services also assists students with problems, concerns, and experiences relating to educational difficulties; i.e., study habits, test-taking stress, lack of motivation, or attitudes related to school. All information regarding appointments and content of counseling is strictly confidential.

University Counseling Services operates the Reboot Center. The Reboot Center offers free services to help students manage stress. An inviting space to relax, re-charge and re-focus. Computer software platforms with video games and visualization help to facilitate stress management skills. Individual consultation about managing stress and improving performance is available.

A broad range of developmental and proactive programming is offered through University Counseling Services in outreach and service to living groups, organizations and academic classes.

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

**Americans With Disabilities Act (ADA) Compliance Program**

Office of Equal Opportunity

OSU is committed to improving the full and nondiscriminatory participation in all aspects of campus life for individuals with disabilities. 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 by identifying and reporting barriers and other access issues encountered throughout the University Community to the Office of Equal Opportunity. Any student who believes they have experienced discrimination on the basis of a disability can seek resolution through the Equal Opportunity Office. For more information, contact the Office of Equal Opportunity, 408 Whitehurst, 405-744-9153, email address eeo@okstate.edu.

**Student Disability Services**

Isabel Medina Reiser—Coordinator

Student Disability Services (SDS) at Oklahoma State University offers academic support to students with disabilities attending the Stillwater campus. Student Disability Services is committed to providing a community that ensures full participation for students. Additionally, Student Disability Services is a resource for faculty and staff members. Appropriate services are determined on an individualized basis and may include academic advisement, specialized testing, accessible textbooks, classroom access, assistive technology, and other services based on disability-related need. Students must initiate a request for services by contacting Student Disability Services at 315 Student Union, 405.744.7116, fax 405.744.8380. In addition, students may exercise certain ADA appeal “rights” if dissatisfied with student services and or their academic accommodations (forms and procedures will be made available as requested).

**University Health Services**

Chris Badow, MHA—Director

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.

University Health Services maintains a staff of full-time physicians, nurses, laboratory technologists, pharmacists, x-ray technicians, and other necessary support personnel who make a specialty of providing the best possible care at the least possible expense for the student.

University Health Services is an ambulatory primary care facility, designed to provide cost-effective, physician-directed health care to students. Laboratory, x-ray, pharmacy and elective services are provided on a fee for service basis. 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. University Health Services is fully accredited by the Accreditation Association for Ambulatory Health Care.

**Health Requirements**

All new students are required to complete the OSU Health History and Immunization form. Oklahoma law requires that students report their compliance with certain required immunizations; specifically measles, mumps, rubella, hepatitis B, and meningitis. Information about the requirements for compliance is explained in detail on the OSU Health History form that is available for download from the Internet at http://uhs.okstate.edu/. Failure to comply with these guidelines may prevent future enrollment.

**Tuberculosis Testing International Students.** All international students are required to be screened for tuberculosis prior to being allowed to complete initial enrollment. This screening must be completed at University Health Services. If screening indicates that TB testing be performed, the student will be responsible for the cost of testing. No tests from outside the US will be accepted. A chest x-ray film from outside the US does NOT satisfy this requirement.

**Tuberculosis Testing Domestic Students.** Domestic students who meet any of the following criteria need to be screened for tuberculosis:

- Students who have resided outside the U.S. for more than eight weeks continuously or intermittently in the last 2 years
- Students with a medical/health condition that suppresses the immune system
- Students with known exposure to someone with active tuberculosis disease.

For more information contact University Health Services, 1202 West Farm Road, Oklahoma State University, Stillwater, Oklahoma, 74078, or download the form from the Internet at uhs.okstate.edu.

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For more information, contact University Health Services, 1202 West Farm Road, Oklahoma State University, Stillwater, Oklahoma, 74078, or download the form from the Internet at uhs.okstate.edu.
Mandatory Health Insurance for Non-Immigrant Students

The Oklahoma State University Board of Regents requires that non-immigrant students maintain health insurance as a condition of enrollment. The premium for the Student Health Insurance Plan will be included with tuition and fees for all non-immigrant Oklahoma State University Students. Please note that Oklahoma State University houses an international student insurance waiver program. This program offers a waiver for international students who provide proof of health insurance coverage. The waiver cannot be used to cover any international students who have already purchased insurance. Waiver forms can be found at: http://iss.okstate.edu.

CampusLink

CampusLink is OSU’s student organization database offering information about more than 450 student groups at OSU. Student development and volunteer service recording. Every student should login to CampusLink and set up their profiles since this is also where all campuswide elections are held. To login, go to https://campuslink.okstate.edu and use your okstate.edu email and password.

Fraternity & Sorority Affairs

Oklahoma State University’s award winning fraternity and sorority community is comprised of members of four governing councils: Interfraternity Council, Multicultural Greek Council, National Pan-Hellenic Council, and Panhelpheric Community while the fraternal community at Oklahoma State University began more than one hundred years ago, its impact continues to flourish on campus. Today, more than 5,000 students are strong and vital members of the OSU fraternity and sorority community. We are proud to have a thriving system on campus with numerous, diverse nationally recognized fraternities and sororities represented.

Our fraternity and sorority community offers students a unique opportunity to have a balanced college life with a focus on academic excellence, brotherhood/sisterhood, community service and responsible social interaction. Greek affiliation also allows students to make lasting friendships with individuals with similar ideals and common purposes.

For more information, visit our website at http://gogreek.okstate.edu.

Honor and Service Organizations

OSU offers opportunities for personal and professional development through membership in 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)
- National Society of Collegiate Scholars
- Order of Omega (honor society for fraternity and sorority 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.) Also on campuslink at https://campuslink.okstate.edu/organizations

International Students and Scholars

The Office of International Students and Scholars (ISS) provide assistance to more than 2,000 nonimmigrant students and scholars from more than 100 countries around the world. The goals of ISS are to assist international students and scholars with education on U.S. immigration regulations, orientation to the OSU environment and the American culture, exposure to the University resources available, and familiarization with the campus and community.

ISS is responsible for advisement and support to students, faculty and staff on matters specifically related to international students and scholars. International students and scholars are required to maintain their immigration status at OSU. ISS offers opportunities to newly admitted international students to and after their arrival in the U.S. Some of the services include pre-arrival information, ground transportation from the Oklahoma City airport to OSU, banking, orientation, enrollment assistance, employment clearances, and support as needed. ISS informs continuing students on events and immigration issues through its weekly ISS listserv and web page. ISS also provides various public presentations on internationally-related issues as requested.

ISS provides numerous services to newly admitted international students to and after their arrival in the U.S. Some of the services include pre-arrival information, ground transportation from the Oklahoma City airport to OSU, banking, orientation, enrollment assistance, employment clearances, and support as needed. ISS informs continuing students on events and immigration issues through its weekly ISS listserv and web page. ISS also provides various public presentations on internationally-related issues as requested.

ISS supports numerous events and activities through the sponsorship of the International Student Organization (ISO) that encourage American and international student integration as well as faculty and staff participation. ISS is located at 250 Student Union within the Department of Leadership and Campus Life. Find us at http://iss.okstate.edu/. ISO can be found at this link http://orgs.okstate.edu/iso/.

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.

Allied Arts

OSU Allied Arts was established in 1922 and is the longest running university performing arts series in the state. Our priority is to broaden students’ horizons by presenting artistically rich and culturally diverse performing arts events. This series gives many students their first taste of opera, ballet, jazz, Shakespeare, or even the Golden Dragon Acrobat from China. Students, faculty and staff can purchase a subscription for all events, or individual tickets to specific shows. To find out more, “Like” OSU Allied Arts & Special Events on Facebook. Also, ticket information and the performance schedule are available at http://alliedarts.okstate.edu.

Department of Leadership and Campus Life

John Mark Day—Director, Department of Leadership and Campus Life
Ruth Loffi—Coordinator, Department of Leadership and Campus Life
Brandon Misty—Manager, Allied Arts and Special Events
Stephen Hasley—Manager, Center for Ethical Leadership
Dawson Metcalf—Coordinator, Camp Cowboy/Leadership Programming
Marie Basler—Coordinator, Non-Traditional Student Services
Kyla Loper—Coordinator, Student Union Programs
Haley Kurt—Administrative Support, Allied Arts/SUAB
Joyce Montgomery—Coordinator, Service-Learning Volunteer Center
Ival Gregory—Assistant Director, Fraternity & Sorority Affairs
Ann Reighlght—Coordinator, Fraternity & Sorority Affairs
Melissa Echols—Administrative Support, Fraternity & Sorority Affairs
Fran Gragg—Assistant Director, Campus Life
Tim Huf—Assistant Director, International Students & Scholars (ISS)
Regina Henry—Coordinator of International Immigrant, ISS
Linda Dunbar—Coordinator, International Tax, ISS
Karen Sebring—Coordinator, Sponsored Students, ISS
Elizabeth Scott—International Student Specialist, ISS
Anne Mahoney—Coordinator of International Undergraduate Admission, ISS
Vivian Wang—Manager of Recruitment and Development in China, ISS
Tri𝗥𝗮χ Chapatara—International Student Specialist, ISS

The Department of Leadership and Campus Life is in the forefront of co-curricular activities on campus. Enhancing a sense of “Campus Community” is a key trust of this department. It is responsible for the facilitation and implementation of programming for students and student organizations at the University. The Department of Leadership and Campus Life’s commitment is to provide an environment that encourages interaction among students, faculty, staff and the community at large through organizations to provide the best quality of services with integrity and respect for a diverse population.

Services provided by the Department of Leadership and Campus Life Center, 211 Student Union, insurance for OSU sponsored trips, notary public, registering posters, flyers and signs, student organization records in liaison with the Student Government Association, Motor Pool requests, campus work orders for student groups, scholarship and membership applications, and a resource center that offers a wide variety of brochures on various subjects.

Additional information about all our services is found at http://campuslife.okstate.edu. The Department of Leadership and Campus Life at OSU encompasses the following administrative and programming areas:

Allied Arts

OSU Allied Arts was established in 1922 and is the longest running university performing arts series in the state. Our priority is to broaden students’ horizons by presenting artistically rich and culturally diverse performing arts events. This series gives many students their first taste of opera, ballet, jazz, Shakespeare, or even the Golden Dragon Acrobat from China. Students, faculty and staff can purchase a subscription for all events, or individual tickets to specific shows. To find out more, “Like” OSU Allied Arts & Special Events on Facebook. Also, ticket information and the performance schedule are available at http://alliedarts.okstate.edu.
The Student Government Association, through its Speaker's Board, 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 interest areas.

Allied Arts conducts lecture-demonstrations in conjunction with its performing arts presentations. In this manner, students can gain additional knowledge of the performing arts and its artists.

Non-Traditional Student Services

The primary goal is to assist nontraditional students, anyone with at least a two-year break in education, by providing support, information and referrals. The coordinator serves as a resource person for the entire campus community and seeks to raise the awareness of faculty, administrators and students with regard to the needs of this special group. All nontraditional students are encouraged to stop by the Department of Leadership and Campus Life Center, 211 Student Union to discuss their concerns or questions. The coordinator also advises students who have rent-related difficulties, such as landlord disputes, or who are looking for housing off-campus. Find us at http://campuslife.okstate.edu/non-traditional-student-services/

The Center for Ethical Leadership

To meet the leadership challenges of the 21st Century, Oklahoma State University’s Center for Ethical Leadership develops and prepares students to be creative, ethical, inclusive, and effective leaders. Through the collaborative efforts of a variety of academic and student affairs’ programs and staff, the mission of the Center for Ethical Leadership is to create, administer, and facilitate the following leadership development activities for OSU students:

- Multidisciplinary instruction and scholarship in leadership and ethics
- Opportunities to experience, meet, and interact with a variety of significant leadership speakers
- Co-curricular and service-learning field experiences
- International leadership study abroad opportunities

The Center’s Programs are divided into Curricular, Co-Curricular, and Recognition Programs. In the Curricular Programs we administer President’s Leadership Council, McKnight Leader/Scholar Program, The Leadership Study Abroad Program and The Leadership Minor Program. In the Co-Curricular Program we offer The Emerging Leaders Program (LEAD), and the Leadership-in-Residence Speaker Series. Every spring semester as part of our recognition programs we acknowledge and celebrate leaders through the Oklahoma State University’s President Leadership Recognition Reception. Find us at http://leadership.okstate.edu/

Office of Parent and Family Relations

Cowboy Parents consists of OSU parents and family members whose goal is to support their students and the University by sponsoring events, activities and scholarships both on campus and in their home communities. Cowboy Parents sponsors scholarships for students, safety programs for students and the Parents’ Handbook that is distributed during new student orientation. The Association sponsors an annual family weekend and dad’s day during the fall of each year and mom’s day during the spring. Members receive free publications, a membership card that entitles them to discounts at select Stillwater area merchants, a vehicle decal to display and electronic newsletters that remind them of campus events, important dates, and deadlines on campus.

The purpose of the Cowboy Parents is to:

- enhance communications between the University and the parents of Oklahoma State students,
- provide parents with a supporting role in the education of their students, while providing a forum for networking with other parents.
- take an active role in promoting the excellence of the University.

The objective of the Cowboy Parents is to:

- encourage parents to support the programs and activities of the University.
- help parents and students in the transitional time when the student begins college.
- support the academic community at Oklahoma State University.
- cultivate and recruit new students and families to the University.
- support student affairs and student services that enhances the students out-of-class experience.

Membership dues are $35.00 annually or a onetime payment of $105.00 for lifetime membership. To join, visit the group’s website at http://parents.okstate.edu.

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, other campus religious organizations and the University administration through the Interfaith Council.

Service Learning Volunteer Center

Since the Service-Learning Volunteer Center’s inception in 1984, Oklahoma State University students have served at hundreds of non-profit agencies, building a reputation of civic responsibility within higher education and other communities in Oklahoma. Working together toward a common goal, the Service-Learning Volunteer Center has had an impact on communities worldwide. The focus of the Service-Learning Volunteer Center is to provide OSU students with opportunities that reflect academic needs and personal interests. Working with local, state and national non-profit agencies, students at Oklahoma State University are provided with opportunities to grow and excel through meaningful hands-on involvement in service, research and academic activities. Through information sessions and an annual service-learning fair, a traditional fall event, the Service Learning Volunteer Center keeps students informed about upcoming events and needs in the local community. Through service-learning, students learn and develop through active participation in thoughtfully organized service experiences that meet actual community needs. The Service-Learning Volunteer Center continues to enrich lives of our community members through intergenerational and interpretative service projects. It is only through the exceptional spirit of volunteerism at Oklahoma State University that the SLVC records immense success in its programs and activities. With more than 230,000 hours of community service recorded, we continue to set and reach new goals.

Further information is available on the Internet at http://volunteer.okstate.edu.

Student Development Transcript

The Student Development Transcript (SDT) gives OSU students the opportunity to record their co-curricular activities in a format similar to an academic transcript. Involvement in all campus organizations may be included. The transcript can be used with applications for scholarships, honorary organizations and with resumes for job applications. Students login to CampusLink at https://campuslink.okstate.edu to begin their transcript. You may contact the Department of Leadership and Campus Life at campuslink@okstate.edu for more information.

Student Union Activities Board

SUAB is the premier programming board at Oklahoma State, enriching OSU through cultural, entertainment, and recreational activities. Students in SUAB coordinate events that are as diverse in nature as the students at OSU, such as major concerts, comedians, speakers, Cowboy Showcase, movies, Bingo, a Coffee House/Open Mic series and Pride Week, featuring Stillwater’s only drag show and many other events. SUAB has five programming committees and five administrative chairs. It is one of the most active campus organizations at OSU. Find us at http://suab.okstate.edu/.
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, and event planning. 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 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 handpicked to meet the high standards and multidimensional mission of a police department.

The OSU Police Department recently implemented a SafeWalk program. Established on November 1, 2013, and staffed with trained Public Service Officers, the SafeWalk program promotes personal safety by offering free walking escorts to members of the OSU community to destinations within the campus and to or from Greek events or events around the Greek Neighborhood. A person can call the OSU Police Department’s non-emergency number (405-744-6523) and request assistance or make a request directly to any Public Service Officer on duty. The SafeWalk program operates between the hours of 7:00 p.m. and 3:00 a.m. daily. In addition to the SafeWalk program, the OSU Public Service Officers perform security checks of campus buildings and surrounding grounds, watching for criminal behavior or suspicious activity, and have direct radio contact with the law enforcement officers of the OSU Police Department.

The OSU Police Department was the first policing agency in the State of Oklahoma to receive accreditation from the Oklahoma Association of Chiefs of Police. The OSU Police Department gained accreditation reviews in 1998 and continues its status after undergoing accreditation reviews in 2002, 2005, 2009, 2012 and 2015. The OSU Police Department is comprised of 34 sworn officers. The deployment of sworn officers (student volunteer and part-time employees) to perform low-threat duties such as escort and assist and selected assignments dealing with traffic and crowd control. Through efficient management of resources and success in gaining grant funding from State and Federal sources, the department continues to provide highly trained officers with appropriate communications and police equipment.

Policies and procedures have been adopted that stress conservation of equipment and supplies. Grants from the Department of Justice and other sources have allowed the complete computerization of the records keeping and data management functions. Other grants have provided funding necessary for the installation of video camera systems and other protective measures in high target areas of the campus. Overall, the department has gained more than four hundred thousand dollars in grant support to provide the OSU community with better protection and police services. All officers are trained in the principles of community oriented policing.

OSU police provide a positive image to visitors and members of the campus community, whether it is providing directions, motorist assistance, 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 cooperating fully 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 provide professional crowd control and traffic regulation before, during, and after such events. As first responders to emergency situations, OSU police are called upon to provide professional assistance to other OSU departments and staff and 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. Service programs, such as motorist assistance, money escorts, and emergency notifications are a part of the department’s efforts to be involved in the community. The OSU emergency phone system was recently updated and expanded, and there are currently 98 emergency phones strategically located on campus. These phones, with immediate response from the police, have been in operation since 1979 and are still being copied by other universities.

Operating under a grant from the Oklahoma Highway Safety Office, the OSU police launched the program Campus Community Alcohol Safety Effort (C-CASE), aimed at promoting traffic safety by educating citizens, primarily students, about the importance of good driving behaviors and 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 and regulations that has contributed to negative results in getting the drunk driver off campus streets and consequentially preventing alcohol-related accidents. This program continues with a combination of education and enforcement efforts directed toward traffic safety and have served as a model for other policing agencies throughout the state of Oklahoma.

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. OSU is the State University. This describes that approach and further believes that the public should know how active the OSU Police is in crime prevention and detection.

The OSU police sponsor a number of special programs for faculty, staff and students designed to provide information about campus security practices and procedures. During freshman parents’ orientation each summer and monthly new employee seminars, procedures, suggested practices, availability of pertinent information, and individual responsibilities are discussed. The OSU police crime prevention staff provides additional safety and security programs as requested. (See also “Avoiding Victimization.”)

The crime statistics for the past three years for OSU may be found on the Internet at police.okstate.edu.

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, 311 (non-emergency) 911 for emergencies, and the Orange Shield Safety App for both emergency and non-emergency, and a police officer will meet the person to gather the information. For those individuals preferring to use personal cell phones, the caller should dial 744-6523 for non-emergency situation, or 911 for emergencies if they do not have the Orange Shield Safety App. The Orange Shield Safety App directs emergency calls to the OSU Police Department when the user is on campus, and connects with the normal 911 center serving the location the caller is in, if the user is off campus. 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, the media, and published on the Public Safety Internet page. Each month the number of incidents in each category of crime are counted and reported to the FBI, and possibly 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.

Students and others are encouraged to report crimes or incidents to persons on campus with significant counseling responsibilities. The OSU Public Safety Department has further developed procedures for collecting information on crimes and violations pertaining to liquor laws, drug-related violations, and weapons violations from such counseling personnel and persons referred for campus disciplinary actions on these offenses. Such violations are published along with other criminal statistics.

Should a student need assistance in reporting crimes or incidents on or off campus, university counselors or police will provide guidance, direction or assistance.

Crimes in Progress. To report a crime in progress, a person, victim or witness, can dial 911 or use one of the outside emergency telephones, call one of the OSU police phone numbers, or use the Orange Shield Safety App. Either reporting method will stimulate the response of police, fire, ambulance, or other first responders. The Orange Shield Safety App also allows texting of pertinent information along with video or still images of crimes in progress or suspicious activity. The Orange Shield Safety App directs emergency calls to the OSU Police Department when the user is on campus, and connects with the normal 911 center serving the location the caller is in if the user is off campus. Crimes
Although both OSU and the Stillwater community enjoy a relatively safe environment, it is important to realize that crimes do occur and that everyone should take reasonable precautions to protect themselves and their property.

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 criminal activities at "off campus" organizations or "off campus" private housing. Crime statistics concerning these locations or areas are available at the Stillwater Police Department.

Crime Statistics. The OSU Public Safety Department collects and publishes crime statistics for the three most recent calendar years concerning the occurrence on campus, in on-campus buildings, or property and on public property adjacent to OSU, of the following offenses reported to the local police agencies or to the OSU Police: Criminal Homicide, Murder and Non-negligent Manslaughter, Negligent Manslaughter, Non-Forcible and Forcible Sex Offenses, Robbery, Aggravated Assault, Burglary, Motor Vehicle Theft, Arson, and Arson for liquidation violations, drug law violations, and weapon violations. Crime statistics are also reported by category of prejudice for any Hate Crimes reported.

All of these statistics are published on the OSU Public Safety Internet site at police.okstate.edu and are available for printing if individuals desire a printed version. The published paper copy can be obtained by contacting the Public Safety Office or by writing to OSU Public Safety, 104 USDA Building, OSU, Stillwater, OK 74078 or by requesting a copy electronically at the above Internet site.

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, and 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 uncontrolled 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 the more notable efforts are:

• Emergency telephone system
• Emergency 911 dialing
• Orange Shield Safety App
• SafeWalk Program
• 24-hour preventive patrols
• Campus foot patrol by uniformed officers
• Police officer bicycle patrol
• Police officer Segway patrol
• Burglar alarms in key areas
• 24-hour staff in residence halls
• Custodial staff in academic buildings after hours
• 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.TIPS (744.8477)

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 34 sworn officers, seven support persons, and nine 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 property owned or operated by OSU. In addition the OSU Police Department has a multi-jurisdictional agreement with the City of Stillwater and Payne County Sheriff’s Office. These agreements provide additional resources for all agencies involved and therefore the OSU Police enjoy an excellent working relationship with other agencies within the community. All campus police officers undergo an extensive selection process and meet state mandated training requirements.

Community Policing. The department subscribes to the concepts of community policing. The officers have been practicing problem-solving concepts for years. A police officer bicycle and Segway patrol was established to provide an opportunity for the officers to have closer contact with students.

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 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 newsletter, faculty/staff newsletter, or in special instances, specific notices to on-campus residences. Such notices may be posted on residence hall entrance doors, in residents’ mail boxes, or placed on electronic voice mail. In addition, the OSU Department of Public Safety maintains an Internet page at police.okstate.edu. This page allows access to the daily crime log, crime prevention tips, and links to other sites providing similar information pertinent to the OSU campus.

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, groups, or other property owned and/or controlled by the University or as part of University activities.

Under OSU regulations, with limited exceptions, no low-point beer or other alcoholic beverage is allowed in OSU housing, including fraternities and sororities. Furthermore, under the same regulations, the possession/consumption of low-point 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, including Lake Carl Blackwell. For further explanation, please 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 employed alcohol by students and employees in buildings, facilities, groups, or other property owned and/or controlled by the University or as part of University activities.

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groups are involved in sexual assault prevention. These groups include 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. They provide 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 dispatched. Determining the extent of physical and emotional trauma that the victim has suffered will be the officer's first concern. If the attack just occurred, the officer will want a brief review of the events, a description of the assailant, the direction of travel, and a description of the vehicle used by the assailant, if any. This information is necessary in order to apprehend the assailant as soon as possible. After the initial interview, the officer or whoever is designated by the victim, will assist in getting a complete change of clothes.

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 needed 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 expenses related to the criminal prosecution. The case is prosecuted by the Office of the District Attorney. The victim only has to contribute time. The Stillwater Medical Center can provide initial medical services for rape victims. The Crime Victims Compensation Board can provide payment for medical services and counseling, even if charges are not filed. The victim need only file an application with the Office of the District Attorney.

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 405.744.5470. Also, a copy of the "Student's Rights and Responsibilities" can be obtained at various locations on campus.

Role of University Housing and Residential Life. The hall directors and resident assistants who work in the residence halls continually attend sexual assault training programs, and they 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 University 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. Services are available to all Oklahoma State University students, regardless of gender, and their significant others.

The psychological and emotional trauma after a sexual assault can be painful. Possible symptoms include: eating disorders, sleep disturbances, lack of trust, guilt feelings, depression, mood swings, and relationship and communication problems. Sexual assault incidents can only be greatly reduced when men and women understand the dynamics involved in sexual assaults and are willing to participate in educational programming and ongoing communication.
Student Code of Conduct

Office of Student Conduct Education and Administration

Campus Address and Phone:
328 Student Union, Stillwater, OK 74078
405.744.5470

Website: studentconduct.okstate.edu

Oklahoma State University is committed to creating and maintaining a productive living and learning community that fosters the intellectual, personal, cultural and ethical development of its students. Self-discipline and valuing for the rights of others are essential to the educational process and to good citizenship. Attendance at Oklahoma State University is a privilege and students are expected to meet or exceed the University standards of conduct both on and off campus.

The purpose of the Student Code of Conduct is to educate students about their civic and social responsibilities as members of the University community. The Student Code of Conduct outlines University policies and procedures that all students are expected to adhere to during their time at OSU. Each student is responsible for reading the Student Code of Conduct in its entirety. It is available online at http://studentconduct.okstate.edu/code and in print from the Office of Student Conduct Education and Administration.

Cowboy Community Standards

The Student Code of Conduct specifies the following behavioral standards that OSU students aspire to follow and promote:

• **Integrity**: Oklahoma State University students are expected to exemplify honest, honor, and respect for the truth in all of their actions.

• **Community**: Oklahoma State University students build and enhance their community. They understand and appreciate how their decisions and actions impact others and are just and equitable in their treatment of all members of the community.

• **Social Justice**: Oklahoma State University students recognize that respecting the dignity of every person is essential for creating and sustaining a flourishing university community. They act to discourage and challenge those who actions may be harmful to and/or diminish the worth of others.

• **Respect**: Oklahoma State University students must show positive regard for each other and for the community.

• **Responsibility**: Oklahoma State University students are expected to accept responsibility for their learning, personal behavior and future success, and students should appropriately challenge others to do the same. Students should use judgment, be trustworthy, and take personal responsibility for their actions.

1 is 2 Many

Oklahoma State University (OSU) takes acts of sexual harassment, which includes sexual violence, extremely seriously and believes that 1 victim is 2 many. Sexual harassment and sexual violence are forms of gender discrimination that are not tolerated at OSU. The university strongly encourages victims to report all acts of gender discrimination. Anyone can report instances of sexual harassment and sexual violence to Student Conduct in 328 Student Union or at 405-744-5470. For more information on sexual harassment or sexual violence visit: http://1is2many.okstate.edu.

All incoming students are required to complete sexual harassment and sexual violence training before enrolling in future semesters. Training can be complete online at http://1is2many.okstate.edu.
OSU Alumni Association

The OSU Alumni Association engages alumni, students and friends to experience lifelong connections to the Alumni Association, Cowboy Family and Oklahoma State University.

The organization offers numerous programs for current students to educate them on OSU history and traditions, engage them in OSU programs and events, and prepare them to be productive graduates of the university.

Membership. The OSU Student Alumni Association is the student membership program of the Alumni Association. With more than 3,000 members, SAA is the largest student group on campus. Members receive many exclusive benefits, both as students and alumni including discounts at more than 40 Stillwater merchants and 800 online retailers, a monthly e-newsletter, exclusive T-shirts, networking opportunities and more.

Life memberships are available at a discounted rate of $600 ($400 savings) to students who opt in to a $75/semester bursar charge for eight semesters. Students may opt in to the program at any time, and post-graduation payment plans are available for non-freshmen who graduate before making eight payments. Annual memberships are also available for $30 per year. Join as a life or annual member at orangeconnection.org/saa.

Student Alumni Board. SAB is a leadership development organization sponsored by the Alumni Association. SAB serves as the governing body for the Student Alumni Association and acts as a liaison between the Alumni Association and the student body. SAB is responsible for planning SAA events, passing along OSU traditions to students, serving as ambassadors at alumni and campus events, speaking at high school scholar banquets on behalf of OSU and planning the annual OSU Legacy Weekend. Students interested may apply for SAB in January 2017 at orangeconnection.org/sab.

Tradition Keepers Program. The Tradition Keepers Program is designed to educate students on the history and traditions of OSU. The program includes the Cowboy Legend book and mobile app with more than 80 traditions to complete and become a “True Cowboy.” Printed Cowboy Legend books are available during New Student Orientation and at the OSU Alumni Center. Download the app to start your journey to becoming a True Cowboy at OKStateTradition.com.

Homecoming. “America’s Greatest Homecoming Celebration” has been presented each year by the OSU Alumni Association since 1920. It is run completely by more than 150 Homecoming student members with the collaboration of thousands in the Greek, residential life and student organization communities. Students interested in serving on a committee may apply for the Big Committee in September 2016 and the Steering Committee in January 2017 at orangeconnection.org/homecoming.

Class Rings. Students with 60 or more credit hours are eligible to purchase an Official OSU Class Ring. The Alumni Association sponsors the ring program officially recognized by the university and hosts two ceremonies each year to present recipients with their rings. Visit orangeconnection.org/ring or call 405.744.3600 for more information.

Student Awards. The Alumni Association recognizes students for their scholarship, campus leadership and service to campus and community with the Seniors of Significance and Outstanding Seniors awards. Students are encouraged to apply in September 2016 at orangeconnection.org/studentawards.

OSU Foundation

The Oklahoma State University Foundation is a 501(c)(3) not-for-profit corporation. Gifts to the Foundation are deductible under Section 170 of the Internal Revenue Code. Established in 1961, the Foundation unites donor passions and university priorities to achieve excellence and manages donated resources efficiently and effectively.

The OSU Board of Regents, through a resolution passed in 1966, directed that gifts or donations made for the benefit of Oklahoma State University be made to the OSU Foundation.

Although it is a separate and distinct legal entity from the Oklahoma State University System, the OSU Foundation maintains a close and cooperative working relationship with the University to establish fundraising priorities and cultivate constituency relationships.

OSU-Oklahoma City

Natalie Shirley—President
Joey Fromheiser, PhD—Vice President of Academic Affairs
Bradford Williams, MS—Vice President of Student Services
Robin Roberts Krieger, MS—Vice President of Business and Industry Training & Economic Development
Ronda Reece, MS—Vice President of Budget and Finance
Mike Widell, MBA—Vice President of Operations

Oklahoma State University-Oklahoma City (OSU-Oklahoma City) is a North Central Association accredited, state-assisted public college serving the technical education and training needs of Oklahoma. Located in the heart of Oklahoma City, at the crossroads of Interstate 44 and Interstate 40, this campus enrolls approximately 6,000 full and part-time students each semester. OSU-Oklahoma City has grown from a campus of one building with fewer than 100 students in 1961 to a campus today consisting of 110 acres, 14 buildings, a military parking facility and 307 full-time faculty and staff.

Taking pride in its student-centered approach to collegiate education and training, OSU-Oklahoma City offers:
- a bachelor of technology degree program,
- 28 associate in applied science degree programs with numerous areas of option,
- nine associate in science degree programs,
- nine certificate programs,
- ten embedded certificate programs,
- developmental education courses, and
- business and industry training.

Curriculum is designed in response to current business and industry needs, and with input from professionals who serve on advisory committees. All energies are directed toward one goal: blending academic and student support services to create a collegiate educational experience that addresses individual student goals and work-force needs.

Bachelor of Technology

The bachelor of technology degree is a 124-credit hour technology-intensive application-focused baccalaureate degree.

Human Services—Emergency Responder Administration

Associate in Applied Science

The associate in applied science degree signifies the completion of at least 60 semester credit hours of collegiate course work (excluding any physical education courses), which will place the graduate on a career path. OSU-Oklahoma City offers 28 associate in applied science degree programs in six divisional areas:

- Agriculture Technologies
- Horticulture Technology
- Veterinary Technology
- Business Administration
- Accounting
- Management
- Health Sciences
- Cardiovascular Sonography
- Nurse Science
- Nutritional Sciences
- Human Services
- Crime Victim/Survivor Services
- Early Care Education
- Emergency Medical Services-Municipal Fire Protection
- Municipal Fire Protection
- Police Science
- Sign Language Interpretation

Liberal Arts

Applied Technology
- Graphic Design
- Technical Spanish/Translation and Interpretation

Science, Technology, Engineering & Mathematics (STEM)

Architectural Technology
- Computer Information Systems
- Construction Technology
- Electrical Power Technology
- Electronics Engineering Technology
- General Engineering Technology
- Information Technology
- Management Information System
- Power Transmission and Distribution Technology
- Renewable/Sustainable Energy
- Surveying Technology
- Wind Turbine Technology

Associate in Science

The associate in science degree is a program designed for transfer to an upper-division bachelor’s degree program. It is typically awarded to those who wish to major in subjects with heavy undergraduate requirements in mathematics and science, including, but not limited to, fields such as engineering and agriculture.
This degree represents successful completion of a minimum of 60 credit hours (excluding any physical education courses). OSU-Oklahoma City offers nine associate in science degree programs:

- Agriculture Technologies
- Horticulture Technology
- Business Administration
- Enterprise Development-Reach Higher

Health Sciences
- Health Care Administration
- Human Services
- Alcohol and Substance Abuse Counseling
- American Sign Language
- Police Science

Liberal Arts
- Enterprise Development - Reach Higher
- Public Service

Science, Technology, Engineering & Mathematics
- Fire Protection & Safety Technology

Philosophy. OSU-Oklahoma City operates on the belief that each person should:
- treated with dignity and respect,
- afforded equal opportunity to acquire a complete educational experience,
- given an opportunity to discover and develop their special aptitudes and insights,
- provided an opportunity to equip themselves for a fulfilling life and responsible citizenship in a world characterized by change.

Mission. Oklahoma State University – Oklahoma City delivers collegiate-level career and transfer educational programs, professional development and support services that prepare individuals to live and work in an increasingly technological and global community.

Institutional Effectiveness and Institutional Grants.

This office develops and implements processes that provide the campus with data, information, and analysis concerning the effectiveness and efficiency of classes, degree and certificate programs, and support services. Timely and accurate data reporting to state and federal agencies as well as institutional and departmental accrediting agencies is a major function since continued accreditation is crucial to the mission of OSU-Oklahoma City.

Institutional Effectiveness is the focal point for campus-wide process improvement. Ensuring that all offices are operating in the most efficient and effective way possible helps the college to continue excelling at preparing its students to live and work in an increasingly global and technological society.

In pursuit of this academic mission, the office also devotes time and effort in support of special projects related to research and funding.

Institutional Grants is dedicated to procuring grant funding to advance the university's strategic initiatives. This department supports faculty and staff members' efforts to develop, compose, and submit grant applications. Grant proposals are monitored through this office to ensure compliance with funding guidelines and reporting requirements.

Functions of OSU-Oklahoma City.
- Maintain an open-door policy, which will provide access to higher education for all eligible individuals, treating all students fairly and equally and with no discrimination, regardless of social, economic or academic background.
- Provide learning opportunities for students to complete a bachelor of technology degree, an associate in applied science degree, an associate in science degree or a certificate program primarily in technical education.
- Prepare students for upper-division academic study; when appropriate, participating in reciprocal and cooperative relationships with educational and various other types of institutions.
- Provide students the opportunity to acquire the knowledge and skills that will enable them to accomplish specified career or personal education goals.
- Provide a developmental studies program to enable students to be successful at the college level.
- Provide a complete student services program, including academic advisement, career planning and placement, enrollment management, counseling services, judicial programs and services, admissions and records, minority student programs and services, veteran services, disability services, student life, financial aid, assessment, student support services, job placement, family resource center and wellness services.
- Conduct classes, workshops, seminars and conferences to accommodate the needs of local business, industry and community groups on a non-credit basis.
- Engage in a continual campus-wide program of assessment and improvement, including regular systematic review of program and funding sources, conduct long- and short-range planning, and provide and encourage faculty and staff development activities to meet stated goals and improve efficiency and effectiveness.

For further information, visit www.osuokc.edu.

OSU Institute of Technology

Bill R. Path, EdD—President
Scott Newman, EdD—Vice President, Academic Affairs
Jim Smith, MS—Vice President, Fiscal Services
Ingram, PhD—Vice President, Student Services

Oklahoma State University Institute of Technology (OSUIT) is a residential branch campus of OSU that focuses upon offering quality education in advancing technological and academic programs. Graduates earn the Associate in Applied Science, Associate in Science and/or Bachelor of Technology degrees.

The institution's core curriculum is as diverse and innovative as its student body. Through OSUIT, individuals receive the comprehensive educational required to prepare them as competitive members of a world-class workforce and contributing members of society. Unique in Oklahoma, the Okmee college blends the best of emerging technologies, and general education coursework to prepare students for rewarding careers in business and industry. Each program is carefully reviewed twice each year by teams of industry and business advisors to ensure course content and instruction remain current and relevant. Students enjoy a low student-to-faculty ratio, an emphasis on hands-on learning, and instruction by industry-experienced faculty.

Significantly contributing to OSU Institute of Technology's uniqueness and success is its extensive array of business and industry partnerships. Many national and international corporations have chosen to partner with OSUIT and support the University and its students through scholarships, training aids and equipment. Students benefit by having greater access to these sponsoring partners and employers at graduation and students in most programs of study also participate in internships. These closely monitored, authentic work experiences in business and industry are directly related to students' disciplines and offer students the opportunity to apply their new knowledge and skills in a real world setting. In addition, most OSUIT interns receive pay during their internships.

OSU Institute of Technology also works collaboratively with a broad range of educational partners—including K-12 systems and career technology centers, as well as other colleges and universities—in the development and facilitation of robust career and educational pathways to and from OSUIT.

Several industry certifications and program accreditations attest to the quality of instruction at OSUIT. The Nursing program is accredited by the Accreditation Commission for Education in Nursing (ACEN) as well as the Oklahoma Board of Nursing (OBN). The Orthotics & Prosthetics program is accredited by the National Commission on Orthotic and Prosthetic Education (NCOPE), which serves in cooperation with the Commission on Accreditation of Allied Health Education Programs (CAAHEP). The Bachelor of Technology in Civil Engineering Technology program is accredited by the Accreditation Board for Engineering and Technology (ABET) Engineering Technology Accreditation Commission.

The Automotive Service Technologies and Collision Repair Technology programs are certified by the National Automotive Technicians Education Foundation (NATEF) and maintain Automotive Service Excellence (ASE) certifications.

The combination of the University’s high-quality educational programs, business and industry partnerships, internship programs, and modern, well-equipped instructional facilities, ensure OSU Institute of Technology graduates are highly marketable and competitive. Job placement for OSUIT graduates is among the highest in Oklahoma, with many receiving several job offers prior to graduation.

The University’s educational programs are divided into ten academic schools, most with multiple instructional programs. Programs offered include:

- School of Arts & Sciences: Associate in Science degrees in Allied Health Sciences, Business, Enterprise Development, and Pre-Education;
- School of Automotive Technologies: Associate in Applied Science degrees in Automotive Collision Repair Technology and Automotive Service Technologies (a general technician degree and multiple manufacturer-specific degrees are available);
- School of Construction Technologies: Associate in Applied Science degrees in Air Conditioning & Refrigeration Technology, Construction Technologies (with options in Construction Management and Electrical Construction), and High Voltage Lineman;
- School of Culinary Arts: Associate in Applied Science degree in Culinary Arts;
- School of Diesel & Heavy Equipment: an Associate in Applied Science degrees in Diesel & Heavy Equipment (a general technician degree and multiple manufacturer-specific degrees are available);
- School of Energy Technologies: Associate in Applied Science degrees in Natural Gas Compression, Pipeline Integrity Technology, and Power Plant Technology;
- School of Engineering Technologies: Associate in Applied Science degrees in Civil Engineering/Surveying Technologies, Engineering Graphics &
Design Drafting Technologies, Engineering Technologies (with options in Electrical/Electronics Technologies, Electromechanical Technologies and Instrumentation Technology), Manufacturing Technologies, and Watchmaking & Microtechnology, as well as Bachelor of Technology degrees in Civil Engineering Technology and Instrumentation Engineering Technology;

- School of Information Technologies: Associate in Science, Associate in Applied Science, and Bachelor of Technology degrees in Information Technologies;
- School of Nursing & Health Sciences: Associate in Applied Science degrees in Nursing, and Orthotics & Prosthetic Technologies;
- School of Visual Communications Technologies: Associate in Applied Science degrees in 3D Modeling & Animation, Graphic Design Technology and Photography Technology.

OSU Institute of Technology operates on a year-around, academic calendar, with classes offered during three full semester terms each year. New academic terms typically begin in early September, early January and late April. The college participates in both national and state financial aid programs. The deadline for financial aid applications, and most University scholarship application, is March 1. Oklahoma State University Institute of Technology is located at 1801 East Fourth Street, Okmulgee, Oklahoma 74447-3901. The toll free phone number at OSUIT is 800.722.4471. Further information is available at go.osuit.edu.

OSU Tulsa

Howard G. Barnett—President
Raja Basu, PhD—Vice President for Academic Affairs

Oklahoma State University offers undergraduate and graduate programs at OSU-Tulsa. For undergraduate programs, lower-division courses (1000- and 2000-level) are available at Tulsa Community College or other area two-year colleges. Students should consult an OSU-Tulsa academic advisor for a list of transferable courses. Upper-division (3000- and 4000-level) and graduate (5000- and 6000-level) are offered at OSU-Tulsa.

Each student wishing to attend OSU in Tulsa must be admitted to either the academic degree program of choice or as a non-degree seeking student. All students must comply with admission procedures of OSU. Once admitted, regulations published in the OSU Catalog govern the student’s pursuit and completion of the degree program.

OSU provides admission, enrollment, financial aid and academic advising services at OSU-Tulsa. Scholarships are also available from OSU-Tulsa. Students may enroll in classes in Tulsa or Stillwater and pay tuition at either location. The student’s official academic records and transcripts are maintained by OSU at the Stillwater campus. Faculty are hired by OSU and the college offering the degree program. Upon completion of an academic program, OSU grants the degree. Students are responsible for making certain each course taken will apply toward the chosen degree or certificate program. Courses taken from other participating universities are treated as transfer credit courses. Transfer credit hours are applied to a student’s degree program in accordance with regulations of OSU.

OSU-Tulsa is administered by a Board of Trustees and is under the governing authority of the OSU Board of Regents. Classes are held at 700 N. Greenwood Ave., Tulsa, OK 74106-0700. Semester class schedules for OSU-Tulsa are available online at http://www.osu-tulsa.okstate.edu/schedule/index.php. For additional information on undergraduate programs, contact the OSU-Tulsa campus at 918.594.8355. For additional information on graduate programs, contact the OSU-Tulsa Graduate Student Services Center at 918.594.8455 or visit the website at www.osu-tulsa.okstate.edu.
As a condition of admission to Undergraduate students must meet the GPA requirements below to continue in college. To help ensure that students possess the skills necessary to be successful in college, the Oklahoma State Regents for Higher Education require students to obtain a 19 ACT subject area score(s) in science reasoning, mathematics, and English to enroll in college level work. Students must pass developmental courses in the first 24 hours attempted or have all subsequent enrollments restricted to developmental courses until the deficiences are removed. If a student fails to remediate in a single subject within the 24 hour limit and is in good academic standing, the adviser and dean may recommend to the Provost that the student be allowed to continue to enroll in college level courses in addition to developmental courses.

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

1. ADMISSION, ACADEMIC STANDING AND WITHDRAWAL

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

Assessment/Course Placement. To help insure that students possess the skills necessary to be successful in college, the Oklahoma State Regents for Higher Education require students to obtain a 19 ACT subject area score(s) in science reasoning, mathematics, and English to enroll in college level work. Students must pass developmental courses within the first 24 hours attempted or have all subsequent enrollments restricted to developmental courses until the deficiencies are removed. If a student fails to remediate in a single subject within the 24 hour limit and is in good academic standing, the adviser and dean may recommend to the Provost that the student be allowed to continue to enroll in college level courses in addition to developmental courses.

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

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

1.4 English Proficiency Requirement. As a condition of admission to undergraduate study at OSU, all persons for whom English is a second language shall be required to present evidence of English proficiency. (See "Undergraduate Admissions.")

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

1.6 Good Academic Standing and Scholaristic Requirements for Continuing Enrollment of a Student Under Academic Probation in an Undergraduate College. Undergraduate students must meet the GPA requirements below to be in good academic standing. Each college, department, or academic program within OSU may require higher standards for admission, retention, or good academic standing.

<table>
<thead>
<tr>
<th>Overall Hours Attempted (total retention/graduation hours attempted)</th>
<th>Minimum Overall Grade-Point Average Required (retention/graduation GPA)</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>

Any student not maintaining an overall GPA as indicated above will be placed on probation for one semester. At the end of that semester, he or she must have a current term (semester) GPA of 2.00, not to include physical education activity (leisure) or developmental courses, or meet the minimum standard required above, in order to continue as a student.

First year students (30 or fewer credit hours, as defined by OSRHE policy) with...
an overall 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. See Academic Regulation 6.4: Grade-Point Average Calculations for a description of overall and current term GPA calculations. These calculations are made three times per year, to coincide with the conclusion of the fall and spring semesters, and the collective summer term. Grades submitted after these calculations are carried forward to the next calculation. (See also Academic Regulation 6.13 Academic Forgiveness.) A student enrolling on probation will seek help from an academic adviser and a counselor in the University Counseling Services when deciding on an academic load and extracurricular activities. 1.7 Academic Suspension. A student on probation will be suspended when he or she earns a current term (semester) GPA of less than a 2.00 in regularly-graded course work not including physical education activity (leisure) or developmental coursework, and the overall grade-point average falls below the following. See Academic Regulation 6.4: Grade-Point Average Calculations for a description of overall and term GPA calculations.

<table>
<thead>
<tr>
<th>Total Overalls Attempted</th>
<th>Minimum Overall Grade-Point Average Required (retention/graduation GPA)</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>

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). Students who wish to appeal suspension status should inquire about procedures and deadlines from their adviser, the Office of Academic Affairs. Students who were concurrently enrolled in another college or university during the semester may appeal the suspension by submitting an official transcript from the institution. Procedures and deadlines for appealing may be obtained from the Office of Academic Affairs.

Readmission after one regular semester (fall or spring) 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 overall (retention/graduation) GPA before readmission to OSU can be considered. A student with 90 or more hours in a specified degree program who has been academically suspended may enroll, at the discretion of the institution, in up to 15 additional credit hours in a further attempt to achieve the requirements for retention. During these 15 hours of enrollment, the student must achieve a minimum 2.00 current term (semester) GPA at the end of each term or must raise the overall (retention) GPA to 2.00 or above to avoid suspension. This senior suspension exception must be approved by the Director of Student Academic Services or Associate Dean for Instruction in the student's college in the form of a letter to the Registrar. This option can be exercised only once per student.

A student suspended from OSU at the end of the spring semester may continue in the summer semester at OSU if this spring suspension was the student's first suspension. The student must complete a minimum of six hours and must achieve a 2.00 current term (summer semester) GPA, or raise the overall (retention/graduation) GPA to the OSRHE standard, in order to continue in the subsequent fall semester. The student should contact his or her dean's office for additional information and restrictions. (See also Academic Regulation 1.7 Academic Suspension.)

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

1.10 Cancelling Enrollment and Withdrawing from the University. Enrollment cancellation occurs when a student drops all classes before classes begin, that is, before the applicable semester or session begins. Student requests to cancel enrollment must be received by the Office of the Registrar before the first day of classes for the term. Enrollment changes, such as cancelling enrollment or withdrawing from the University are the responsibility of the student. Failure to attend classes or nonpayment of tuition and fees does not constitute official cancellation. Withdrawing from the University occurs when a student drops all classes after classes begin, that is, after the applicable semester or session begins. The withdrawal process is initiated with the student’s academic adviser in the student’s academic student services office. International students must also consult with International Students and Scholars (ISS) before dropping courses or withdrawing for the semester. Under reporting regulations required by the Student and Exchange Visitor Information System (SEVIS), dropping below full-time can put a student’s visa status in jeopardy. General cancellation and withdrawal periods are provided in the table below.

The Academic Calendar provides specific dates for each term. Exceptions to these deadlines may be considered by petition due to documented extraordinary circumstances and committee approval. The Retroactive Drop/Withdraw Petition and the Petition for a Refund of Tuition and Fees are available on the Registrar website (registrar.okstate.edu).

### Cancellation/Withdrawal Periods for Full-Semester (16-week) Courses

<table>
<thead>
<tr>
<th>Semester Time Period*</th>
<th>Course Grade</th>
<th>Course-Related Tuition/Fee Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before term begins (cancellation)</td>
<td>No transcript record</td>
<td>100% refund</td>
</tr>
<tr>
<td>First 6 days</td>
<td>No transcript record</td>
<td>100% refund</td>
</tr>
<tr>
<td>Days 7-10</td>
<td>&quot;W&quot;</td>
<td>Partial refund</td>
</tr>
<tr>
<td>Weeks 1-3</td>
<td>&quot;W&quot;</td>
<td>No refund</td>
</tr>
<tr>
<td>Weeks 13-14</td>
<td>&quot;W&quot; or &quot;F&quot; as assigned by instructor</td>
<td>No refund</td>
</tr>
<tr>
<td>Weeks 15-16</td>
<td>Final grade as assigned by instructor</td>
<td>No refund</td>
</tr>
</tbody>
</table>

*Summer courses, intersession courses, and other courses that do not extend through the entire 16-week semester follow proportionate cancellation/withdrawal/refund periods.

### 2. STUDENT STATUS

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

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

These hours are calculated based on overall (retention/graduation) hours earned.

2.2 Full-Time Students. Undergraduate students who are enrolled in 12 or more semester credit hours (six or more for the summer session) are classified as "full-time" students. Graduate students enrolled in nine or more semester credit hours (four or more for the summer session) are classified as "full-time,"

Credit hours offered through correspondence study are not counted toward full-time status, unless the course is independent study taken through regular enrollment.

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 Teaching/Research Assistant (GTA or GRA) appointment who is enrolled in a minimum of six hours during the fall or spring semester and two 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. There is no reduction in credit hour requirements in the final semester of enrollment for GTA or GRAs.

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

Doctoral Candidacy Enrollment Requirements. Doctoral students who have completed the requirements for admission to doctoral candidacy and had their “Admission to Doctoral Candidacy” form approved by the Graduate College may enroll for a minimum of at least two credit hours during any term and be considered full-time. This post-candidacy reduced enrollment option applies to all qualified graduate students, including GTAs, GRAs, international students and veterans receiving VA benefits. A student is normally expected to enroll primarily in research hours or in program-approved courses after being admitted to doctoral candidacy.

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 regular 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 regular 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. UNDERGRADUATE DEGREE REQUIREMENTS

3.1 Date of Matriculation. A student's matriculation date is associated with his or her first term after high school graduation as an admitted student 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. A student generally follows the degree requirements associated with his or her matriculation year. Although
the curriculum may be revised before a student graduates, students 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 degree requirements that have been established since matriculation. The time limit for following a given undergraduate degree program is six years. Time limits for graduate degrees are described under "Academic Regulations" in the "Graduate College" section of the Catalog.

3.3 The Honors College. (See the "Academic Enrichment Programs" section of the Catalog.)

3.4 General Education Requirements. In keeping with State Regents policy, every OSU undergraduate degree includes a 40-credit-hour general education core that meets the requirements specified in the following table. Degree requirements may exceed the minimum criteria stated below. Courses that carry general education designations are identified in student information systems and the Course Descriptions section of the Catalog. Physical education/leisure activity courses may not be used to meet general education requirements.

<table>
<thead>
<tr>
<th>General Education Area</th>
<th>General Education Designation</th>
<th>Required Minimum (at least 40 credit hours total)</th>
<th>Courses and Notes (See degree plans for details)</th>
<th>Specific Required General Education Courses on Degree Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition</td>
<td></td>
<td>6 credit hours</td>
<td>See Academic Regulation 3.5.</td>
<td>Courses are specified on all degree plans as required by OSRHE and OSU policy</td>
</tr>
<tr>
<td>American History</td>
<td></td>
<td>3 credit hours</td>
<td>HIST 1103, 1483, or 1493</td>
<td></td>
</tr>
<tr>
<td>American Government</td>
<td></td>
<td>3 credit hours</td>
<td>POLS 1113</td>
<td></td>
</tr>
<tr>
<td>Analytical and Quantitative thought</td>
<td></td>
<td>3 credit hours of mathematics</td>
<td>MATH or STAT prefix with A designation</td>
<td>Course may be specified on degree plans</td>
</tr>
<tr>
<td>Humanities</td>
<td>H</td>
<td>6 credit hours</td>
<td>Courses with H designation</td>
<td></td>
</tr>
<tr>
<td>Social and Behavioral Sciences</td>
<td>S</td>
<td>3 credit hours</td>
<td>Course with S designation</td>
<td></td>
</tr>
<tr>
<td>Natural Sciences</td>
<td>N</td>
<td>6 credit hours</td>
<td>Courses with N designation; One course must also carry the L designation</td>
<td></td>
</tr>
<tr>
<td>Scientific Investigation (Laboratory Science)</td>
<td>L</td>
<td>1 course</td>
<td>See Natural Sciences</td>
<td></td>
</tr>
<tr>
<td>Diversity</td>
<td>D</td>
<td>1 course</td>
<td>Course with D designation; No minimum credit hour requirement; Institutional policy, not required by the State Regents; Unless the D course also carries an A, H, S, or N, it is not included in the minimum 40-credit-hour general education total.</td>
<td></td>
</tr>
<tr>
<td>International Dimension</td>
<td>I</td>
<td>1 course</td>
<td>Course with I designation; No minimum credit hour requirement; Institutional policy, not required by the State Regents; Unless the I course also carries an A, H, S, or N, it is not included in the minimum 40-credit-hour general education total.</td>
<td></td>
</tr>
</tbody>
</table>

OSU degree plans are designed to allow maximum flexibility within general education areas H, S, N, L, D, and I, so students may select the courses they take to fulfill these requirements. No more than 10 general education credit hours should be specific required courses on a degree plan, as indicated in the last row of the table above. Departments/Colleges may request an exception from the Office of Academic Affairs to specify more than 10 hours, but such exceptions would generally be approved only in the case of formal written external accreditation or certification requirements.

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 Academic Affairs. (See also Academic Regulation 3.6.)

For students who earn an Associate of Arts or Associate of Science degree from another college or university within the Oklahoma State System, the lower-division general education requirement of the baccalaureate degree shall be the responsibility of the institution awarding the associate degree, providing the general education requirements specified by the State Regents are met. OSU may, with the approval of the State Regents, require that transferring students complete additional general education work for the degree if such additional work is programmed as a part of the upper division requirements of the degree program.

The Oklahoma State Regents for Higher Education require computer proficiency prior to graduation. The use of computers is an integral part of every OSU degree program; hence a student demonstrates proficiency by satisfactorily completing degree requirements.

3.5 English Composition Requirement. The University requires a minimum of six semester credit hours in English composition to graduate. The required sequence of courses is ENGL 1113 and ENGL 1213. For those who qualify, ENGL 1123 or 1313 may be substituted for ENGL 1113. Students who earn an "A" or "B" in ENGL 1113 (or ENGL 1123 or 1313) or who earn three semester credit hours in English composition through credit by exam, and who have the consent of their college, may substitute ENGL 3323 for ENGL 1213. Students who qualify may substitute ENGL 1223 or 1413 for ENGL 1213. A third course may be required by the student's college to satisfy either an additional communication or oral communication requirement.

3.6 Substitution of Required Courses. A course substitution is a specific course that takes the place of a required course on a degree plan because it meets the content and/or spirit of the requirement. Individual colleges have the authority to approve substitutions for required courses on degree plans with two exceptions: (1) Substitutions related to university general education requirements require approval from Academic Affairs (see Academic Regulation 3.4), with the exception of the English composition substitutions described in Academic Regulation 3.5. (2) A lower-division course may not be substituted for an upper-division course to meet degree requirements.

3.7 Waiving of Required Courses. A course waiver excuses a student from completing a required course on a degree plan because the student has fulfilled the content requirement of the course by completing other courses or academic experiences. A course waiver does not result in awarding credit hours and consequently does not reduce the number of semester credit hours required for the degree or for any other degree-related requirements. A maximum of six semester credit hours may be waived, and waiver approval is granted only in special circumstances. Required courses in English, American history and American government cannot be waived. Waivers must be approved by the student’s adviser, the head of the student’s major department and the dean of the college. Waivers involving university general education requirements must in addition be approved by Academic Affairs.

3.8 Changing Majors. Students are advised to select a specific major no later than the end of the sophomore year. Students not planning to change majors should complete the core within a master’s degree options, it should not be assumed that obtaining a second baccalaureate degree from OSU may use all applicable courses toward a second degree. A minimum of 30 semester credit hours of additional work, including all requirements of the second baccalaureate degree, is required. An additional baccalaureate degree may not be earned in the same major as the first degree earned at OSU. This requirement is not applicable to both a BS degree in Sociology with concentration in Anthropology and a BS degree in Sociology with concentration in Applied Sociology. Completion of requirements for more than one concentration may be noted on the official transcript, but a second degree will not be awarded.

Second Graduate Degrees. The Oklahoma State Regents for Higher Education (OSRHE) do not allow students to obtain a second degree in the same "major" as the first degree, even if the options/concentrations are different. For example, it is not possible to earn both an MS degree in Physics with a concentration in Medical Physics and an MS degree in Physics with a concentration in Optics and Photonics. Completion of requirements for more than one concentration may be noted on the official transcript, but a second degree will not be awarded. Additionally, because of the OSRHE requirement core within a master’s degree options, it should not be assumed that obtaining an additional option/concentration within the same program and level will be possible. Careful discussions and planning with the Graduate Program Coordinator before or admission to a second major or double degree is recommended. For example, it is not possible to earn both a BS degree in Sociology with concentration in Anthropology and a BS degree in Sociology with concentration in Applied Sociology. Completion of requirements for more than one concentration may be noted on the official transcript, but a second degree will not be awarded.

3.11 Double Majors and Minors. A double major can be earned by satisfying the field of concentration requirements for the second major and any additional departmental requirements. If the general education courses are met from one college, they do not need to be met for the second major if it is in another college. The second major does not necessarily require hours above the minimum required for the first major. Whether additional hours are required generally depends upon the number of electives allowed by the first major and the degree of overlap between courses in the two fields of concentration.

Minors are available for many departments. A student should check with the department to find out what the requirements are to obtain a minor in that area. A list of current minors can be found in the "Degree Programs" section of the Catalog.
Final examinations are scheduled at the end of each semester and are preceded by pre-finals week, which begins seven days prior to the first day of finals. During pre-finals week, all normal class activities will continue; however, no assignment, test or examination accounting for more than five percent of the course grade may be given; and no activity or field trip may be scheduled that conflicts with another class. This excludes make-up and laboratory examinations, out-of-class assignments or projects made prior to pre-finals week, and independent study courses. No student or campus organization may hold meetings, banquets, receptions, or may sponsor or participate in any activity, program, or related function that requires student participation. Additional information may be obtained from the student services office of each college or the Office of Academic Affairs.

3.13 Final Exam Overload. In the event that a student has three or more final exams scheduled for a single day, that student is entitled to arrange with the faculty member(s) to reschedule the highest numbered course (based on the 4-digit course number) to reschedule that examination at a time of mutual convenience during final exam week. (Common final exams are not among those to be rescheduled unless two common exams are scheduled at the same time.) The affected student will notify the instructor a written request to reschedule the affected exam at a different time at least two weeks prior to the beginning of final exam week. In seeking to provide relief to the student, the instructor may request that the student provide a copy of his or her schedule to confirm the difficulty. The instructor has one week prior to the beginning of final exam week to arrange a mutually convenient time for administration of the final exam, after which the student may take the request to the instructor’s department head.

4. CREDITS

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

4.2 Credit Earned Through Outreach and Correspondence. Outreach Credit. Outreach credit is earned by OSU-Admitted students who complete credit courses offered during normal academic terms through OSU academic outreach programs. Outreach courses are also referred to as “electronically delivered” and “traditional off-campus courses and programs” in State Regents’ policy. OSU accepts transfer outreach credit from other accredited institutions. Outreach credit is fully applicable toward the satisfaction of requirements for academic degrees and certificates consistent with State Regents’ and institutional residence and degree requirements.

Correspondence Credit. Correspondence credit is earned by students who complete year-long correspondence study courses offered through OSU Correspondence Education. Admission to OSU is not required to earn correspondence credit unless the student intends to apply the credits toward an OSU degree. OSU accepts transfer credit to a maximum of eight semester credit hours earned through correspondence study from other accredited institutions. Credits earned through correspondence study cannot exceed one-fourth of the credits required for a baccalaureate degree. (See also Academic Regulations 2.2, 4.1, 5.5, and 6.11.)

4.3 Transfer Credit from Other Accredited Four-Year Institutions. Except as excluded in Academic Regulations 4.4 Transfer of Credit from Community Colleges and 7.2 Residence Credit Requirements, credits transferred from accredited senior colleges will apply toward baccalaureate degrees in the same way that they would have applied if they had 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 that department and the academic dean.

4.4 Transfer Credit from Community Colleges. Credits will be accepted by transfer from a community 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 Credit from International Colleges and Universities. Credit is accepted based on equivalent standards as outlined in Academic Regulations 4.3 and 4.4. Credit is accepted based on the U.S. letter grade equivalents for the post-secondary grading method used in each country of study.

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

a. credit earned by examination will be recorded on a student’s OSU transcript with a neutral grade of “CBE-P” (Pass) if the student earns the equivalent of a “C” or better on the examination. No grade is recorded if the student fails the exam;

b. credit earned by examination does not count toward the minimum of 30 hours that must be earned in residence (See Academic Regulation 7.2 Residence Credit Requirements);

c. 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 that language (See Academic Regulation 4.9 Foreign Language Credit for Native Speakers);

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, military, or other commitments make it impossible to take or complete credit courses during a regular semester may apply for an examination for the subject. In addition to the regulations listed above, to qualify for an OSU Advanced Standing Examination the student must:

a. be enrolled at OSU;

b. not have taken an Advanced Standing exam over the course within the preceding six months;

c. receive the approval of the head of the department and the associate dean in which the course is offered;

1. present a valid student I.D. at the examination.

Information pertaining to OSU Advanced Standing Examinations may be obtained from the Office of Undergraduate Academic Administration.

Military Credit. OSU accepts credit as recommended by the American Council on Education (ACE), as published in "The Guide to the Evaluation of Military Experiences in the Armed Services," for selected educational experiences provided by the armed forces. OSU also accepts credit earned through the DSST exams (DANTES Subject Standardized Tests) for active veteran and dependent military personnel.

Students who wish to establish credit for military training should request and submit a copy of their JST (Joint Services Transcript) and/or a DSST transcript to the Office of Undergraduate Admissions for evaluation.

Training Programs. OSU awards credit as recommended by the American Council on Education (ACE) in the “National Guide to Educational Credit for Training Programs.” Students may present certificates of completion or a transcript from the ACE Registry of Credit Recommendations to the Office of Undergraduate Admissions for evaluation. OSU also awards credit based on the recommendation of the Board of Regents of the University of the State of New York in the NCCRS (National College Credit Recommendation Service, formerly National PONSI).

4.7 Graduate Credit Hours for a Senior. An OSU undergraduate senior may take a limited number of courses for graduate credit toward an OSU degree program. These credits may not be utilized for both a baccalaureate degree and a graduate degree. The courses in question must be approved for graduate credit as listed in the Course Catalog. The applicability of such graduate courses to a specific graduate program will be determined by the student’s graduate advisory committee when the student enrolls in the Graduate College and submits a plan of study for an advanced degree.

To receive credit, a Graduate Credit for Seniors form must be completed by the student to receive graduate credit for courses taken. This form must be submitted to the Graduate College prior to the end of the second week of class instruction of a regular semester, or the first week of a regular summer session. The required form is available on the Graduate College's Internet site or in the Graduate College.

Such credit may be earned only if the following conditions are satisfied at the time of application:

1. Students must have a minimum overall (cumulative retention/graduation) undergraduate GPA of 3.0.

2. The total enrollment must not exceed 18 credit hours for a regular semester or nine credit hours for a summer session.

3. The student must be within 12 semester credit hours of completing requirements for the baccalaureate degree at the beginning of the semester or summer session in which courses are taken for graduate credit.

4. Admission to courses taken for graduate credit must have approval of the course instructor, the director of the undergraduate student services office associated with the student’s major, and the dean of the Graduate College.

Not more than 15 semester credit hours taken while a senior may be approved for graduate credit. The student must earn a grade of “B” or higher in those courses for which he or she seeks graduate credit. Students are cautioned that institutions other than OSU may or may not allow courses taken for graduate credit during the senior year to be transferred into one of their graduate programs.
4.8 Semester Credit Hour. A semester credit hour is equivalent to (a) sixteen 50-minute class sessions (including examinations) conducted under the guidance of a qualified instructor plus 32 hours of preparation time, or (b) sixteen 3-hour laboratory sessions, or (c) sixteen 2-hour laboratory sessions plus 16 hours of preparation time. These same equivalencies apply to outreach courses, short courses and other learning formats for which academic credit is awarded.

4.9 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 fourth digit indicates whether the course is an undergraduate or graduate credit. For example, a course numbered 1213 should be interpreted as a freshman, or beginning, level course carrying three hours of credit. A course number beginning with zero indicates that the course does not carry University credit. A course number beginning with one indicates that the course carries variable credit.

Graduate Sections of Mixed Credit 3000 or 4000-level Courses (Undergraduate courses that are approved for graduate credit). Some courses have been approved to be offered for both undergraduate and graduate credit. These 3000 and 4000-level courses are identified in the Course Catalog. A student must perform additional assignments at an intellectual level commensurate with graduate level work as specified in the course syllabus to earn graduate credit for such a class. The instructor for any course for which graduate credit is received must be a member of the Graduate Faculty. Separate class sections are offered for undergraduate and graduate credit, but the course sections may be crosslisted (meet at the same time on the same days in the same classroom with the same instructor).

5.2 Maximum Semester Credit Hour Load. Undergraduate students are allowed to enroll in the number of credit hours each semester that do not result in academic overload, which is defined as the number of semester-credit-hours 25 percent or more than the number of weeks in the applicable academic term. See the “Graduate College” section of the Catalog for graduate student enrollment information.

Undergraduates desiring to carry an academic overload must have demonstrated readiness to perform on an overload basis, either through superior performance on a college aptitude test or on the basis of superior academic achievement in high school or college, and must complete a Petition for Excessive Hours (available in the Office of the Registrar). The maximum academic overload in any given term is limited to the number of semester-credit-hours which is 50 percent greater than the total number of weeks in the applicable academic term. Exceptions to deserving students may be granted by the Office of Academic Affairs.

In a regular 16-week Fall or Spring semester, the maximum enrollment for undergraduates without special approval is 18 credit hours. Enrollment in 20 to 24 credit hours results in academic overload, which requires a Petition for Excessive Hours. Enrollment in 25 or more credit hours requires both a Petition for Excessive Hours and approval by the Office of Academic Affairs.

Proportionate credit-hour limits apply to summer sessions and intersession periods separately, depending on the length of the session.

5.3 Adding Courses. The sixth class day of a regular semester or the third class day of an eight-week summer session, or the proportionate period for block or short courses is the last day a course may be added (nonrestrictive). With instructor and academic adviser approval, a course may be added during the second week of classes (seventh through tenth class days) of a regular semester or the fourth through sixth class day of an eight-week summer session, or the proportionate period for block or short courses (restrictive).

5.4 Dropping Courses. Dropping refers to the dropping of one or more courses while remaining enrolled in at least one other OSU course for a given semester. Courses may not be dropped without the approval of the student’s academic adviser. Enrollment changes, such as dropping courses, are the responsibility of the student. Failure to attend classes or nonpayment of tuition and fees does not constitute dropping a course.

General drop periods are provided in the table below. The Academic Calendar provides specific dates for each term. Exceptions to these deadlines may be considered by petition to documented extraordinary circumstances and committee approval. The Retroactive Drop/Withdraw Petition and the Petition for a Refund of Tuition and Fees forms are available on the Registrar website.

Periods for Dropping Full-Semester (16-week) Courses

<table>
<thead>
<tr>
<th>Semester Time Period*</th>
<th>Course Grade</th>
<th>Course-Related Tuition/Fee Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before term begins</td>
<td>No transcript record</td>
<td>100% refund</td>
</tr>
<tr>
<td>First 6 days</td>
<td>No transcript record</td>
<td>100% refund</td>
</tr>
<tr>
<td>Days 7-10</td>
<td>“W”</td>
<td>Partial refund</td>
</tr>
<tr>
<td>Weeks 3-12</td>
<td>“W”</td>
<td>No refund</td>
</tr>
<tr>
<td>Weeks 13-16</td>
<td>No drop option - Final grade</td>
<td>No refund</td>
</tr>
</tbody>
</table>

*Summer courses, intersession courses, and other courses that do not extend through the entire 16-week semester follow proportionate drop/refund periods.

A student may not drop any course in which a violation of academic integrity is pending against the student. If the student admits responsibility for a violation meeting a grade of “F” for an assignment or examination, the instructor or Academic Integrity Panel may permit the student to drop the course with a grade of “W”. If the student is found not responsible for the violation, 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 responsible for the violation, the instructor may assign an appropriate sanction, including assigning the grade “F” for the assignment/examination or “F” for the course. (See Policy and Procedures Letter 02-0822).

International students need to consult with International Students and Scholars (ISS) before dropping courses or withdrawing for the semester. Under reporting regulations required by the Student and Exchange Visitor Information System (SEVIS), dropping below full-time can put a student’s visa status in jeopardy.

5.5 Concurrent Enrollment. A student who desires to earn credits concurrently at another institution or through correspondence, 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 Course Prerequisites. Course prerequisites are listed in the Course Catalog. When no prerequisites are listed for courses numbered 3000 or 4000, it is understood that the prerequisite is approval of the student’s adviser. 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. Prerequisites for lower-division courses may also be waived by a student’s academic adviser if examination of the student’s academic record warrants such a waiver. 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 number 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. Generally, the maximum number of students permitted in an honors section is 22 students. The Director of The Honors College may slightly increase or decrease the size of some honors sections. The number of students enrolled in a class may not exceed the fire code capacity of the designated classroom.

5.8 Priority Enrollment. Currently enrolled/continuing students register for summer and fall classes during the latter part of the preceding spring semester, and for spring classes during the latter part of the fall semester. In order to facilitate access to courses required for timely degree completion, a student’s priority for enrollment generally follows academic class level with seniors having the highest priority. Some exceptions to this basic priority may be necessary to accommodate bona fide student needs, such as a special priority for physically disabled students. The Office of Academic Affairs determines enrollment priorities, and enrollment schedules and priorities are posted in the enrollment guide located on the Registrar’s website at registrar.okstate.edu.

Full-time staff members may utilize priority enrollment to help ensure they are given an opportunity to identify a section(s) at a time that is least disruptive to work in the office. This benefit of priority enrollment is extended to full-time (100% FTE), regular staff members. Staff members employed at less than one hundred percent are not eligible for priority enrollment.

5.9 Late Enrollment. Students are allowed and encouraged to enroll well before the beginning of a given term (fall, spring, summer). Students whose initial enrollment for the term occurs on or after the first day of the term will be charged a late enrollment fee. A student is permitted to add classes after initial enrollment without a late enrollment fee during the first two weeks of a 16-week semester or through the fifth day of an eight-week summer session or during proportionate periods for block or short courses. See the “Tuition, Fees, and Cost Estimates” section of the Catalog for the current late enrollment fee amount.
5.10 Payment of Tuition and Fees. Oklahoma State University (OSU) combines enrollment costs and charges from different areas on campus into one consolidated student account. By enrolling/registering in classes, students accept the responsibility of the costs associated with the courses unless dropping/withdrawal occurs by the published dates to receive credit. The Bursar Office generates monthly electronic billing statements based on the last business day of every month detailing charges, credits, and payments that occurred during the month. A billing email notification is sent to the student’s OSU email address at the beginning of each month when the billing statement is available for viewing online. An alternate email address can be added during O-Key registration. Your alternate email should be a private, reliable, non-OSU email address. Your OSU email is still considered to be the primary source for receiving electronic communications from the University; providing an alternate email allows an additional way to receive private communications from the University. No one other than the student should receive billing notifications, an authorized user email address may be set up by the student through Student Self Service at http://my.okstate.edu by clicking on the bursar section. You may also set up an alternate email in the Student self service, Authorizations and access is located through the bursar website at http://bursar.okstate.edu.

Payment is due no later than the 15th of each month. All tuition and fees (required and optional) and other charges are considered past due if not paid by the 15th of the billing month. Late fees and holds can be avoided by paying by the published deadline. Students may use their O-Key credentials to view online real-time account activity through Student Self Service at http://my.okstate.edu. Failure to view a bill does not relieve the student of his/her financial obligation. It is the student’s responsibility to update addresses and phone numbers to the University. All alterations such as book orders may occur throughout the semester, often after financial aid has processed. Students are responsible for paying these subsequent charges as they appear on monthly bursar billing statements. In efforts to assist students in meeting financial obligations, Oklahoma State University offers a semester-based payment plan as an alternative to the traditional lump-sum payment method. This plan provides an opportunity for families (authorized users) and students to pay University billed expenses in regular monthly payments. No financial charges are associated with the payment option plan or enrollment holds if payments are made as promised. The Payment Plan is available online each semester. The student can sign-up online via Student Self Service at http://my.okstate.edu/ by clicking on the bursar section. It is important to designate an important email address under the authorized user tab by entering their email address for access to the payment plan enrollment. September 15th is the deadline to enroll in the Fall plan and February 15th is the deadline to enroll for the Spring plan. Summer enrollment is not eligible for the plan. A $25 non-refundable application fee is required at the time of application each semester. If the student is participating in the payment plan, and has also been awarded financial aid, our office will be unable to refund any resulting student account credit balance until the student’s payment plan has been completed and paid off. In the event that a student’s financial aid award exceeds the remaining amount owed for his/her payment plan, it is the student’s responsibility to contact our office and reduce the (original) amount of the plan if he/she so chooses. Payment plan participants receive installment due notification via email, all emails are sent from the monthly billing notification. The monthly billing notification informs payment plan participants of the total monthly billing statement amount for informational purposes. Providing a paper check as payment authorizes Oklahoma State University to clear that check electronically. Bank accounts may be debited the same day payment is recorded. Electronically cleared transactions appear on bank statements even though checks are not presented to the financial institution. Any resubmission due to insufficient funds may also occur electronically. All transactions are secure and payment by check constitutes acceptance of these terms. Refusal or return of a check assessed a $25 fee and the account holder is responsible for all dishonored payments which have been processed on their account. If a payment is returned to the University by the bank and the payment was made to get enrolled, the Bursar may cancel enrollment and refer to student conduct as a possibility. Delinquent accounts accrue a penalty at the rate of 1.5% monthly (19.56% APR). Any charges incurred by the University in an effort to collect delinquent accounts are assessed to and become the responsibility of the account holder. Delinquent account information is released to credit reporting agencies, which may endanger the student’s credit rating on a local or national level. Past due accounts are presented to the warrant intercept program (WIP) that captures state income tax refunds to pay outstanding OSU debt. Oklahoma law has jurisdiction and any disputes arising shall be determined in accordance with the law of this jurisdiction. Accounts must be cleared before a student can obtain the release of any academic records such as transcript, receive a diploma or enroll for subsequent semesters. Oklahoma State University extends bursar optional charges to students in order to facilitate use of real-time or other online based services. Bursar accounts must remain current or charging privileges may be revoked. If the student’s federal or institutional financial aid or third-party sponsor payment is either not received by Oklahoma State University or is not eligible, the student shall be responsible for the total amount incurred. The student still has the responsibility for paying their bursar account obligations by the due date. Consent is assumed that communication via all phone numbers, including cell phones, provided to the University as a source of contact could occur. Communication may include from its agents (including collection agencies) for purposes of collecting any portion of your account financial obligation which is past due. The University reserves the right to request prepayment before allowing registration for future terms based upon previous actions.

5.11 Auditing Courses. A student who does not wish to receive credit in a course may enroll as an auditor, provided space is available and the student obtains approval from the instructor of the course and his or her adviser. (Note: Adviser permission is only required for currently enrolled students.) A student who enrolls as an auditor must verify that he or she will not petition to receive course credit for the method of coursework that is described below under “Audit to Credit.” Instructor discretion will determine the auditor’s level of class participation, such as taking exams or turning in assignments. Audited courses do not count in the determination of full-time student status and do not apply toward Veterans Affairs benefits. Laboratory courses, private music lessons, studio art courses, outreach courses, and other courses that require special course fees are not open for audit enrollment.

The audit enrollment form is available on the Office of the Registrar website (registrar.okstate.edu). Initial enrollment in a course as an auditor may be completed only between the first and the tenth class day (inclusive) of a 16-week semester and proportionate periods for shorter sessions. Students changing enrollment status from audit to credit must have been admitted to OSU.

Credit to Audit. A student who is already enrolled for credit in a course may change the enrollment to audit only if the student officially drops the course (or, if appropriate, withdraws) at the time the student changes to audit. This action is not allowed after the drop/withdraw deadline for the course. The audit action will not remove the original course withdrawal notation from the student’s transcript.

Audited courses appear on a student’s official transcript with an indication that the student was an audit enrollment. An “AU” appended when the grade normally would appear. The “AU” does not contribute to a student’s GPA, and no credit hours are earned for the course.

Audit enrollments follow the same resident and non-resident tuition and fee policies as credit enrollments. Late enrollment fees are waived for audit enrollments. Any individual 65 years or older may audit a class at no charge. The audit tuition and fees are also waived for faculty and staff who have retired from the University under the Oklahoma Teacher Retirement System’s “Rule of 80” or “Rule of 90” regardless of age at time of retirement (OSU Policy 2-0108).

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,” “FI,” “I,” “NP,” “P,” “S,” “U,” “W,” or “R,” “SR,” or “UR.”

Descriptions of the grades are provided below. For graduate students, a grade of “D” or “F” is considered a failing grade. Additional consequences and/or requirements for graduate students receiving “C,” “D,” and “F” grades also exist in most graduate programs. Irrespective of letter grades received, an overall 3.00 GPA must be maintained. See the “Graduate College” section of the Catalog.

Undergraduate

Graduate

Grade “A” Excellent

Grade “A” Excellent

Grade “B” Good

Grade “B” Good

Grade “C” Average

Grade “C” Passing

Grade “D” Below average

Grade “D” No Graduate Degree Credit

Grade “F” Failure

Grade “F” No Graduate Degree Credit

Grade “FI!” (pronounced F shriek). The “!” indicates that the student failed the course because of a violation of academic integrity. Students may remove the first “I” (though not the “F”) from their transcripts by completing an academic integrity educational program. The “FI!” will appear on the transcript for a minimum of one semester. (See also academincintegrity.okstate.edu)

“Incomplete” Grade. This grade is given to a student who satisfactorily completes the majority of course requirements, but who has not met all conditions to receive a grade (not less than 50% of the course grade as outlined in the course syllabus) and whose work averaged “D” or better, but who has been unavoidably prevented from completing the remaining work of the course. This grade is considered temporary. The instructor should notify the student of the conditions the student must fulfill in order to complete the course. The instructor will submit a final grade of “I” along with an incomplete final/default grade. The default is the projected grade the student would earn if he or she received a zero for the remaining coursework. Grades of “A,” “S,” “UR” and “SR” are not permitted for the default grade, and an instructor may not require the student to repeat the course to remove the incomplete.

The academic transcript will reflect an “I” grade for the course until the final grade is assigned.

The maximum time allowed for a student to complete the course is one calendar year.
This grade is given for satisfactory (equivalent to a GPA of 2.00 or above) and the remaining requirements.

It is the responsibility of the student to satisfy the requirements stipulated by the instructor at the time the incomplete grade is assigned; it is the responsibility of the instructor to initiate action to have any new permanent grade entered as soon as possible after the student completes the course or, after one year, partially fulfills the remaining requirements.

Upon completion of any or all of the remaining requirements, or at the end of the one-year period (whichever occurs first), the incomplete grade on the transcript is changed to reflect the final grade for the course. Any course in which none of the remaining requirements are fulfilled will, after one year, have the incomplete grade changed to the default grade. If the student opts to graduate prior to the end of the one year period and if the course is required for graduation, the remaining course requirements must be completed and the final grade assigned by the deadline for course work completion for his or her final graduating semester. If the course is not required for graduation, the standard completion time limits apply. When the temporary incomplete grade is replaced with the incomplete final grade, this action is not considered a violation of the policy that states a grade will not be lowered after graduation.

An incomplete grade that was assigned prior to the Fall 2008 semester and is not cleared within the designated time limit remains a permanent "I" grade on the transcript.

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

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

Grade "S" or "U." This grade is given for satisfactory (equivalent to a "C" or better) or unsatisfactory work in developmental courses in English, mathematics, reading, and science. On the transcript, developmental courses are designated by "DEV" preceding the grade, such as "DEV-A." These grades count in attempted hours, but not in earned hours. They are not included in GPA calculations and do not satisfy degree requirements.

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

Grade "R." This grade is given to a student in a master's degree creative component course, and other courses as appropriate, when course work is still in progress. It is the responsibility of the instructor to initiate action to have a permanent letter grade entered as soon as possible after the student completes the course work.

Grade "SR" or "UR." These grades are given for satisfactory and unsatisfactory work, respectively, in thesis or dissertation courses (5000 and 6000). Both credit hours and grade points are ignored in calculating grade point averages, but courses in which a grade of "SR" is earned may be used toward minimum degree requirements.

Mark of "CBE" preceding a grade. Grades for credit by exam (P or S) are designated on the transcript by "CBE" preceding the grade, such as "CBE-P." These grades count in attempted hours, but not in earned hours. They are not included in GPA calculations.

Mark of "PA" preceding a grade. Grades for performance/activity (leisure) courses are designated on the transcript by "PA" preceding the grade, such as "PA-B." These grades count in attempted hours, but not in earned hours, and they are not included in GPA calculations. Limitations exist on applying these courses toward degree requirements.

Mark of "AU." An "AU" indicates that the student enrolled as an auditor in the course. 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.
Grade "F" yields 0 grade points per semester credit hour.

6.4 Grade-Point Average Calculations. 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," "R," "SR," "UR," or the mark of "AU" or "N" will not affect the grade-point average. In addition, the following courses are excluded from GPA calculations: developmental courses, physical education activity (leisure) courses, and courses repeated (with an original grade of "D" or "F") or reprinted/renewed based on State Regents policy. (See Academic Regulation 6.13 Academic Forgiveness.)
6.12 Violation of Academic Integrity. Oklahoma State University is committed to maintaining the highest level of academic integrity and ethical behavior. It is necessary that all members of the University support and promulgate the values of honesty and responsibility appropriate for an academic community. Not only does such academic integrity and ethical behavior contribute to the status of the University, but it also represents an important component of the educational process. To assure a high level of integrity among students, behaviors that violate academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submission of the same work for credit, another person's work, unauthorized access to examinations, altering or destroying the work of others, and fraudulently altering academic records) will not be condoned nor tolerated. Violations may subject the student to disciplinary action, including the following: receiving a failing grade on an assignment, examination, or course; receiving an "F" notation of a violation of academic integrity on the transcript; and suspension from the University. In the event an incident is not resolved at the time grade reports are due to the Registrar (e.g., alleged violation is discovered during the final examination period), the instructor will assign an incomplete grade until the allegation is resolved. (See also academicintegrity.okstate.edu)

6.13 Academic Forgiveness (Undergraduates). Repeated Courses. A student shall have the prerogative to repeat a course and have only the second grade, even if it is lower than the first grade, included in the calculation of the overall (retention/graduation) grade-point average 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 along with a notation indicating whether the course is included in or excluded from the GPA. All other repeated courses, those in excess of the 18-hour, four-course maximum and those with a grade of "C" or better in the original course, are included in the grade-point averages.

Academic Reprieve. A currently enrolled or former OSU student may request an academic reprieve for 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 reprieved 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 (A, B, C, D, F) course work (a minimum of 12 hours) excluding physical education activity or performance courses since the semester requested to be reprieved; (c) the student has not previously been granted an academic reprieve or renewal; (d) there were extenuating circumstances which caused the student to perform poorly during the semester. Course work with a passing grade included in a reprieved semester may be used to demonstrate competency in the subject matter. However, the course work may not be used to fulfill credit hour degree requirements. Academic Renewal. A currently enrolled or former OSU student may request an academic renewal for all courses taken prior to a specified date if the following conditions are met: (a) at least five years must have elapsed between the last semester being renewed and the renewal request; (b) prior to requesting academic renewal, the student must have earned a GPA of 2.00 or higher with no grade lower than a "C" in all regularly graded (A, B, C, D, F) course work (a minimum of 12 hours) excluding physical education activity or performance courses since the semester requested to be reprieved; (c) the request will be for all courses completed before the date specified in the request for renewal; (d) there were extenuating circumstances which caused the student to perform poorly during the semester. Course work with a passing grade included in a renewed course may be used to demonstrate competency in the subject matter. However, the course work may not be used to fulfill credit hour degree requirements.

Requests for Reprieve or Renewal. A student may request an academic reprieve or renewal by submitting an Academic Reprieve or Renewal Petition to Academic Affairs. A committee appointed by Academic Affairs reviews each request and approves or denies a request based on the conditions stated above and the committee's judgment concerning the extenuating circumstances reported by the student. Courses that are reprieved or renewed remain on the student's transcript but are excluded from the overall (retention and graduation) grade-point average. (See also OSU Policy 2-0820, Academic Forgiveness for Undergraduate Students.)

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 Credit Requirements. Students must earn at least 30 semester credit hours at OSU. At least 15 of the final 30 hours applied toward the degree at OSU must be earned in residence at OSU. In the Spears School of Business, a minimum of 15 of the last 30 hours applied toward the degree and at least 50 percent of the upper-division hours required in the major field must be satisfactorily completed at OSU.

7.3 Residence Waivers for Certain Premedical and Pre-law Students. Students who complete at least 30 semester credit hours in a recognized premedical science or pre-law preparatory program and are admitted to a professional program leading to the doctoral degree at an accredited professional school, including medicine, osteopathic medicine, chiropractic medicine, veterinary medicine, dentistry, optometry, pharmacy, physical therapy, podiatry, and law, will be awarded the appropriate baccalaureate degree upon the successful completion of 30 semester credit hours in professional school courses applicable to the OSU major. This option is available only to students who have completed all other degree requirements for the major, have taken and passed the last 30 semester credit hours of work at OSU prior to transferring to a professional school (See Academic Regulation 7.2 Residence Credit Requirements), and have completed at least 60 semester credit hours at a baccalaureate degree granting institution (See Academic Regulation 4.4 Transfer Credit from Community Colleges). Credits from accredited professional schools that are part of baccalaureate degree-granting institutions will satisfy the 60 semester credit hour requirement.

7.4 Minimum Hours for Graduation. Each degree program requires a specific minimum number of semester credit hours for graduation, as indicated in the Catalog. A new 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 (leisure 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.) A minimum of 30 hours is required in the major field. Of these 30 hours, at least 15 hours must be upper-division. Hours of "S" or "U" earned in developmental courses may not count toward total hours.

7.5 Grade-Point Average for Graduation. An overall (retention/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 exclusions from developmental courses and physical education activity courses. (See Academic Regulation 6.13 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.

7.6 Payment of Graduation Fees. Basic graduation cost is included in the records maintenance fee.

7.7 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 the "Academic Enrichment Programs" section of the Catalog.)

7.8 Graduation Application. All degree candidates must submit a graduation application online via Self Service before or during the final semester to be eligible for graduation. Undergraduates must be classified as a senior before they can submit a graduation application, and graduate students must have filed an approved Graduate Clearance Form with the Graduate College before they are eligible to submit a graduation application.

Students must submit their graduation application by November 1 for their name to appear in the fall commencement program, and by April 1 for spring and summer graduate names to appear in the spring commencement program. Students who will complete all degree requirements in the summer should file their graduation application for the summer term, but are invited to participate in the spring commencement ceremony.

Students whose graduation application has become inactive (due to not meeting degree requirements, changing a component of their degree program, or other factors) will be required to submit a new graduation application via Self Service. Graduates can apply to complete their applications during the summer; students have only until the end of the spring semester to complete all degree requirements. Students not meeting degree requirements are not met. Contact the Registrar's Office if assistance is needed.

7.9 Presence at Commencement Exercises. The University will hold Commencement exercises at the close of the fall semester and at the close of the spring semester. 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 at the close of the previous spring semester.

The University encourages all candidates for degrees to be present at the Commencement exercises. Attendance is not compulsory.

7.10 Graduation with Distinction. Students who earn an OSU undergraduate degree may also earn a level of distinction based upon the final overall (retention/graduation) grade-point average. (See also Academic Regulation 6.4 Grade-Point Average Calculations) The level of distinction added to the diploma and transcript is:

Overall (retention/graduation) grade point average

<table>
<thead>
<tr>
<th>Distinction</th>
<th>Cum laude</th>
<th>Magna cum laude</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.90 to 4.00</td>
<td>3.80 to 3.89</td>
<td>3.70 to 3.79</td>
</tr>
</tbody>
</table>

This grade-point average calculation is two decimal places only, e.g., 3.69. In actually, this GPA may be 3.69785 if additional digits were to be added. However, the value used to determine distinction is 3.69, which does not qualify for a level of distinction.

7.11 Professional Education. Professional Education requires a minimum 2.50 GPA to admission to Professional Education, student teaching and graduation. This requirement is consistent with state standards for students who complete professional education programs and seek licensure in the state of Oklahoma.
The College of Agricultural Sciences and Natural Resources (CASNR) is the academic unit of the Division of Agricultural Sciences and Natural Resources, and offers outstanding undergraduate and graduate programs that are recognized nationally and internationally. Programs in agriculture, forestry, landscape architecture and agricultural communications are accredited by the appropriate professional societies and approved by the Liaison Committee on Accreditation of Education Programs in Agricultural Sciences and Natural Resources. Most programs also have specific approval through professional organizations. The College of Agricultural Sciences and Natural Resources is designed to provide outstanding students with opportunities to pursue new challenges and academic excellence. Honors students are readily available to students and work closely with the students throughout their academic careers.

High School Preparation and Admission Requirements
The high school preparation and admission requirements for the College are the same as the general University requirements.

Transfer Students
Students who transfer from an accredited college or two year college must meet the general University admission requirements. All transferred courses are recorded on the OSU transcript; however, a minimum of 60 credit hours must be earned at a senior college (baccalaureate degree-granting institution) to meet the College’s degree requirements. Credits will be accepted by transfer from a community college to meet lower-division (i.e., 1000- and 2000-level courses) requirements only. 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 over 1.4 million dollars in scholarships by the College and its departments. The following areas are considered in the awarding of scholarships: scholastic standing in high school or college; leadership qualities; financial need and sincere interest in the various agricultural disciplines. Additional information may be obtained from the office of the associate dean, College of Agricultural Sciences and Natural Resources, Oklahoma State University, 136 Agriculture Hall, Stillwater, OK 74078. Applications are available at casnr.okstate.edu.

Student Success Center
The College of Agricultural Sciences and Natural Resources Student Success Center (SSC) helps students with educational, career and personal goals. The SSC provides important services, programs and student support including Student Academic Mentors, Ambassadors, Career Liaisons, Freshmen in Transition, Success Coaches for Outstanding Transfer Students, Career Services, Prospective Student Services, assistance with tutoring or other services, and liaison to the OSU Writing Center, Mathematics Learning Resource Center and the Learning and Student Success Opportunity Center.

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. Academic advisers are readily available to students and work closely with the students throughout their academic careers.

Special Academic Programs
Honors Program. The Honors College through 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 study 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 one another. 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.

For eligibility requirement information for new freshman, transfer, and current OSU students, please refer to the Honors College section of the catalog. Online information is available at http://honors.okstate.edu.

Pre-Veterinary Medicine Curriculum. Specific pre-veterinary science majors in agribusiness, animal science, biochemistry and molecular biology, entomology, and natural resources and ecology management as offered in the College of Agricultural Sciences and Natural Resources, include all courses required for admission to the Center for Veterinary Health Sciences.

Although the pre-veterinary 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 more information on application requirements, refer to the “Center for Veterinary Health Sciences.”
section in the Catalog and the current brochure, OSU Veterinary Medicine Admission Requirements.

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 BS degree, the required total semester credit hours vary by department, major and option. A minimum of 40 semester credit hours and 100 grade-points must be earned in courses numbered 3000 or above. The Bachelor of Landscape Architecture is a five-year program requiring 150 credit hours.

College and Departmental Clubs, Organizations and Honor Societies
Agricultural Communicators of Tomorrow
Agricultural Economics Graduate Student Association
Aggie-X Club
Agronomy Club
Alpha Epsilon
Alpha Tau Alpha (Agricultural Education Honor Society)
Alpha Zeta (College Honor Society)
American Fisheries Society
American Society of Agricultural & Biological Engineers
American Society of Landscape Architects
Biochemistry Club
Biochemistry & Molecular Biology Graduate Student Association
Block and Bridge Club
CASNR Ambassadors
CASNR Career Liaisons
CASNR Student Council
Collegiate Farm Bureau
Collegiate 4-H
Collegiate FFA/JOTA
Cowboy Motorsports
Cowboys for Christ
Dairy Science Club
Environmental Science Club
Food Industry Club
Freshmen in Transition
Horsemens Association
Horticulture Club
Landscape Management Club
Meat Science Association
Minorities in Agriculture, Natural Resources and Related Sciences
Oklahoma Collegiate Cattlemen
Oklahoma Collegiate Cattlegirls
Pi Alpha Xi
Plant and Soil Sciences Graduate Student Organization
Pre-Veterinary Science Club
Rodeo Association
Sanborn Entomology Club
Sigma Lambda Alpha (Landscape Architecture Honor Society)
Society of American Foresters/Forestry Club
Society for Range Management
Soil and Water Conservation Society
Student Organization for International Agriculture
Swine Club
Turk Club
Wildlife Society
Xi Sigma Pi (Forestry Honor Society)

Agricultural Communications
Robert Terry, Jr., Ph.D.—Professor and Head
Modern agriculture, with its diversity and specialization, requires accurate communication between industry leaders and the public. Education in agricultural communications prepares students to provide the necessary communication between industry leaders and the public. The Bachelor of Landscape Architecture is a five-year program requiring 150 credit hours.

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

Graduate Programs
The Master of Science degree in agricultural communications is designed to build mastery of knowledge in key areas such as communication theory, history, philosophy, technology, advanced communication skills and research and data analysis. The Master of Science degree in agricultural communications reflects the distinctive body of knowledge, research base, professional delivery and program focus of the discipline. In addition, the program introduces and requires students to apply research tools and methods.

The Master of Science program serves two primary purposes: (a) encouraging mastery of discipline-specific knowledge with an introduction to research and data analysis and (b) offering discipline-specific knowledge with professional application to the work setting.

The Master of Science program offers students two options for completion of the degree: thesis option and formal report option. The thesis option requires a 30 approved credit hours of course work, which includes a six credit hour formal thesis following the graduate college format. The formal report option requires 32 approved semester credit hours of course work, which includes a two credit hour formal report.

Students applying for the Master of Science program without a background in the appropriate option will be expected to complete course work to bring their preparation to an acceptable level.

Admission Requirements. All students accepted into the agricultural communications Master of Science degree program will be expected to meet all University and Graduate College requirements and to have earned a degree in agricultural communications or related field from an accredited university. Applicants from outside agricultural communications will be required to complete prerequisite courses equivalent to the knowledge and competencies expected in the agricultural communications undergraduate program.

An undergraduate grade point average of 2.80 overall on a 4.00 scale or 3.00 in the last 30 hours is required. The applicant must complete the Graduate Record Examination, submit a statement of goals for pursuing the master's degree, and submit letters of reference from at least three people knowledgeable of the applicant's professional qualifications. These references should include statements relating to (a) the applicant's success in professional or academic work, or commitment to professions allied with the disciplines in the College of Agricultural Sciences and Natural Resources, (b) the applicant's prior academic record as a reflection of ability to succeed in a Master of Science program, and (c) the applicant's potential for success in research, writing and course work at the Master of Science level. If such references are not available, the applicant should submit references from one or more faculty members familiar with the applicant's academic career. Other references should be from individuals capable of addressing the applicant's ability to successfully complete a Master of Science program.

Review Process for Admission. The Office of the Associate Dean of Graduate Studies manages all procedures and records pertinent to admission. The admission process is ongoing with admission recommendations rendered by the graduate faculty in the department. To be eligible for committee review, each applicant must submit an application for admission to the Graduate College, transcripts of all academic records, reference letters, goal statement and GRE scores.

Agricultural Economics
Mike Woods, Ph.D.—Professor and Head
The Department of Agricultural Economics at Oklahoma State University offers programs of study leading to the BS, MS, MA, and PhD degrees in Agricultural Economics and the BS and MS degree in Agribusiness. Agricultural economics and agribusiness curricula study the economic relationships among individuals, firms, and service agencies in agriculture and between the agricultural sector and other sectors of the economy. The department’s courses emphasize the economic issues and concepts associated with producing, processing, marketing, and consuming agricultural goods and services and those used in the industry.

Undergraduate programs in Agricultural Economics and Agribusiness combine instruction in technical agricultural sciences with education in the application of economic and business management principles and tools. The agricultural economist or agribusiness person draws upon the physical and social sciences to outline, understand, and solve economic problems created by agriculture’s dynamic operating environment. Curricula in the Department of Agricultural Economics emphasize the decision-making and problem-solving skills used in the management of agricultural production and marketing firms.

Study in agricultural economics or agribusiness prepares students to excel in many challenging careers. Many graduates work to improve food production and processing throughout the world. Other graduates work with government policies that affect the food and fiber sector. Others assist rural communities to adjust and thrive in the rapidly changing world. Graduates also help protect and maintain natural resources and the environment for the greatest benefit of
Minor in Agricultural Economics and Agribusiness

The minor helps students understand the basics of economics and business within the context of Agricultural Sciences and Natural Resources. Requirements of the minor include an introduction to Agricultural Economics or Microeconomics and Financial Accounting or Agribusiness Accounting and Taxation plus 15 hours controlled electives of upper division Agricultural Economics courses.

Minor in Environmental Economics, Politics and Policy

This minor offered in cooperation with Political Science helps students understand economic politics and policy issues related to environmental issues. Requirements of the minor include an introduction to Agricultural Economics or Microeconomics, a 3000 level environmental economics course, Environmental Economics and Resource Development and 12 hours controlled electives from related upper division courses.

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. PhD 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, related to planning, distribution and consumption of agricultural products. Courses in economic theory, econometrics, mathematical programming, and statistics are an integral part of the program. Primary data analysis, natural resource use, international trade, planning, policy, and development are also important topics included in graduate coursework. The faculty provide direction and individual guidance to student research in marketing, production, management of agricultural enterprises, demand and price analysis, land and water use and development, non-market valuation, rural development and planning, agricultural finance, international trade, farm appraisal, agricultural policy, econometrics, and experimental economics. Students specialize through course electives and research topics. In addition, an advisory committee guides each student in preparing the program of study to ensure that the student's background, graduate course work, and research program together 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, statistics, and intermediate macro- and microeconomic theory constitute a minimum background for advanced study in agricultural economics. In certain cases, a student can take part of this work after admission but the work will not count towards a graduate degree. Acceptance by an adviser and the student's advisory committee is required for admission to the program.

Agricultural Education

Robert Terry, Jr., PhD—Professor and Head

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 BS, MAg, MS or PhD degrees. The Agricultural Education program is accredited by the Council for the Accreditation of Education Preparation (CAEP).

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 initial requirements for initial certification in most states. Graduates look forward to careers ranging from Agricultural Education teacher and Cooperative Extension Educator to agricultural sales, marketing and production positions. Some students find it advantageous to enroll in a dual major i.e., Animal Science/Agricultural Education or Agricultural Education/Agricultural Communications, thus meeting requirements in both Agricultural Education and another major within the College of Agricultural Sciences and Natural Resources. The undergraduate Agricultural Education major is 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. To meet the needs of both international and domestic students, plans of study are developed for academic excellence specific to students' career goals. The selection and organization of courses are made in consultation with the adviser and the student's advisory committee.

The Master of Science develops the theoretical and research foundation for advanced graduate students in addition to further knowledge and skills in agriculture and education. It is designed primarily for those students interested in research. Two options are offered in the Master of Science program. The thesis option requires 30 approved credit hours of course work, which includes a six-credit hour formal thesis following the graduate college format. The non-thesis option requires 32 approved semester hours of course work, which includes a two-credit hour formal report.

The Doctor of Philosophy program is designed to prepare graduates for careers in professional education, supervision, administration, curriculum development and other areas of professional leadership in Agriculture, Agribusiness, Extension, Career and Technology, and Agricultural Communications. Within the minimum 60 credit hour requirement, 15 credit hours must be completed in Agricultural Education. In addition, 15 credit hours must be completed in an area of specialization such as Agricultural Extension, Technical Agriculture, Educational Administration, or other similar areas. The additional hours include 15 hours of research design and statistics and 15 hours for the dissertation.

Admission Requirements

Evidence of academic ability (2.80 GPA or above) in undergraduate coursework must compensate for such deficiencies before completing the masters degree. Evidence of academic ability (2.80 GPA or above) in undergraduate coursework is required. Three letters of reference and a statement of purpose are required. Graduate Record Exam (GRE) scores are required for students seeking admission to the Master of Science degree program.

Admission to the doctoral degree program is based upon evidence that the applicant meets the general requirements of the Graduate College, has demonstrated superior achievement, and can successfully complete a doctoral program as evidenced by three letters of recommendation, GRE scores, a minimum of 2.80 undergraduate grade-point average and 3.00 graduate grade-point average, three years of successful professional experience, and a philosophy statement and goals. Alternative criteria may be considered by the graduate committee for those who submit ample supportive evidence of other exemplary qualifications.

Agricultural Leadership

Robert Terry, Jr., PhD—Professor and Head

The Agricultural Leadership curriculum is guided by five core values: commitment to agriculture, authenticity leadership, diversity, critical thinking and professionalism. Agricultural leadership faculty align course objectives, learning opportunities and student experiences with the five core values. Beginning students study historical and theoretical foundations in leadership, authentic leadership and transformational leadership before exploring contemporary leadership issues, leadership curriculum facilitation and assessment within the discipline. Specific topics within course work include leadership styles, power, decision-making, ethical leadership, motivational theories and team processes.

In addition to leadership course work, the curriculum provides a broad introduction to the agricultural sciences and natural resources and allows students to develop an area of emphasis or pursue a minor in areas such as Animal Science, Soil Science or Agricultural Economics.

Minor in Leadership Education

The minor is designed to prepare students to serve as leadership educators within the context of their chosen major. Students explore career options in leadership education, develop an understanding of...
their own leadership style and philosophy, acquire knowledge about leadership theories, explore contemporary issues in leadership, evaluate current leadership research and learn to design and facilitate leadership training. Requirements of the minor include 17 hours of leadership course work, including six hours of elective courses.

Graduate Programs

Students may pursue graduate studies in agricultural leadership through the Master of Agriculture in Agricultural Leadership or the department’s Doctor of Philosophy or Master of Science in agricultural education. The Master of Agricultural degree in Agricultural Leadership is an advanced studies program for practitioners seeking to develop their knowledge related to leadership and its application to the agricultural industry. Graduates pursue careers in extension, government, corporate agriculture, and human resources and training. The Master of Agriculture program requires 32 approved semester hours of course work including a 12 hour area of emphasis. Graduate course work in agricultural leadership includes leadership theory and practice, developments in agricultural and extension education, and a creative component. More information on graduate opportunities in Agricultural Leadership is available under Agricultural Education graduate programs.

Agriculture

Cynda R. Clary, PhD—Professor and Associate Dean

Graduate Programs

The Master of Agriculture degree is designed for students interested in graduate professional training. The degree is offered with specializations in: Agribusiness and Agricultural Leadership.

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 PhD degree will generally follow the requirements of the Master of Science degree program, but with the specializations noted above.

Character of Program. This program provides a greater breadth of study than the Master of Science program. Emphasis is on practical application of the technical aspects of the discipline as well as discipline interrelationships. In some areas of specialization, the focus is on an applied research concept and a broader program of study 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 and advisory committee with whom he or she will develop a plan of study in accordance with guidelines and requirements established in the department responsible for the program.

Animal Science

Clint Rusk, PhD—Professor and Head

Animal science focuses on the science, art and business of the production of beef cattle, dairy cattle, horses, poultry, sheep, goats, swine and pet/ companion animals. An animal scientist is concerned with the application of the principles of the biological, physical and social sciences to the problems associated with domestic animal production and management.

Animal science is also concerned with food production. The food industry is one of the largest and most important industries in the United States. Food scientists are concerned with the processing, safety, quality control and marketing of food.

Undergraduate students may elect to pursue a Bachelor of Science degree in the department by majoring in either animal science or food science. Internship programs providing one to six months of off-campus work experience are available in all animal science options and are part of the curriculum for food science. Participation in undergraduate organizations (Animal Science Leadership Alliance, Block and Bridle, Dairy Science, Horsemen’s Association, Food Science Club, Meat Science Association, Oklahoma Collegiate Cattlemen, Oklahoma Collegiate Cattle Club, judging teams (livestock, meats, horses, or dairy cattle) and academic programs (honors, undergraduate research scholars, and academic quadrathlon) improves social, communication, leadership and academic skills and abilities.

Animal Science. Undergraduate students may elect study emphasis programs in the areas of Animal Biotechnology, Business, Livestock Merchandising, Pre-Veterinary Animal Science, Production, and Ranch Operations, or a double major with Agricultural Communications or with Agricultural Education. In addition, students have the opportunity to concentrate their studies on one or more animal species.

Students interested in veterinary medicine may complete the pre-veterinary medicine requirements at the same time they are working toward a BS 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, reproductive physiology, and nutrition. As seniors, students complete a series of advanced animal science courses which are designed to apply knowledge obtained in previous courses to livestock systems. Every opportunity is taken in teaching to utilize the excellent herds and flocks 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, research, feed and protein production, state and federal agencies concerned with inspection, grading or regulation; banking and financial activities, sales and service positions with companies involved with feeds, pharmaceuticals or other animal products; biotechnology; opportunities in Agricultural Extension or teaching; and work in the processing, distributing and merchandising of dairy, beef, pork and meat products.

Minor in Animal Science. The minor is designed to give students the core courses in Animal Science to supplement their chosen major. Animal Science coursework required for the minor will provide students with the knowledge to be competitive and succeed in the animal agriculture industry. The requirements include ANSI 1124; Introduction to Animal Science and 18 additional hours of core Animal Science courses that the student can select to personalize their programs. The basic core of advanced Animal Science courses include genetics, reproductive physiology, and nutrition. Students can then complete a series of advanced animal science courses designed to apply knowledge obtained in previous courses to animal systems.

Food Science. Food science is an applied field. A food scientist is someone who applies the basic sciences: biology, physics, chemistry, and mathematics to the food industry. In our understanding of these factors that affect food quality, safety, and nutrition. Food science is applied to the selection, preservation, processing, packaging, distribution, and use of safe, nutritious, and wholesome foods.

There are four study emphasis programs in the food science major: Science, Industry, Meat Science and Food Safety.

The Science emphasis gives students a well-grounded background in chemistry, physics, mathematics and biology as well as food science. Students who elect this option usually have a primary interest in science and will be prepared to enter graduate education programs in food science.

This Science emphasis is also an excellent choice for students interested in professional schools such as medical school, dental school, pharmacy, physical therapy, or veterinary medicine. Students who elect not to pursue a graduate degree or a professional degree are prepared to work in any facet of the food industry, especially those jobs focused on research, product development and food analysis.

The Industry emphasis provides a basic understanding of the chemical and physical processes of food processing. Students pursuing this option are prepared to enter food plant management, quality assurance, quality control, product development and sales.

The Meat Science emphasis provides a background knowledge and understanding in live animal production, slaughtering and fabrication, and meat processing along with a basic understanding of the factors that affect meat quality. Students pursuing this option are prepared to enter the meat industry working in quality assurance, slaughter/fabrication, meat processing, product development and sales.

The Food Safety emphasis provides knowledge and experience in food safety issues and practices affecting all sectors of the food industry from production agriculture to wholesale and retail distribution channels. Students pursuing this option are prepared to enter the food industry with expertise in food safety programs, auditing, and quality assurance.

Minor in Food Science. The minor includes the core courses in Food Science. Requirements include FDSC 1133 – Introduction to Food Science and 18 additional hours of core Food Sciences courses that the student can select from to personalize their programs. The basic core of food science courses include food chemistry, food microbiology, quality control, and food analysis, as well as meat science courses for students interested in the meat industry or dairy and dairy products courses for students interested in the dairy industry. Students can complete their program with advanced courses in these areas.

Graduate Programs. The Department of Animal Science offers programs leading to the Doctor of Philosophy or Master of Science degree in Animal Science and contributes to the interdepartmental food science graduate program. Research areas of emphasis are available in Animal Breeding (quantitative and molecular genetics), Animal Behavior, Animal Biotechnology, Grazing Livestock, Nutrition and Management, Immunology, Animal Reproduction and Physiology, Animal Biotechnology, and Meat 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 Chemistry, Manufacturing, Microbiology, Human Nutrition, Food Science, Animal Biotechnology, Grazing Livestock, Nutrition and Management, Immunology, Animal Reproduction and Physiology, Animal Biotechnology, and Meat Science.

2016-2017 University Catalog
Biochemistry and Molecular Biology

John E. Gustafson, PhD—Professor and Head

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 and thus, must be fluent in the concepts of biological sciences. Since a biochemist's tools include many techniques derived from the physical sciences, he or she must receive sound education in mathematics, physics and chemistry. Our academic programs are designed to integrate these disciplines, preparing students for a wide range of professional careers.

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 genetics techniques.

The Department of Biochemistry and Molecular Biology administers two BS degree options in Biochemistry and Molecular Biology through the College of Agricultural Sciences and Natural Resources, and a BS degree through the College of Arts and Sciences. In 2016, the two BS degree options administered through the College of Agricultural Sciences and Natural Resources became accredited by the American Society of Biochemistry and Molecular Biology, providing students taking these degree options an opportunity to take the American Society of Biochemistry and Molecular Biology certification exam. An honors program is available in all three degree plans. Also available is a 4+1 Year Masters by Coursework program. The undergraduate curriculum provides a broad background in chemistry and the biological sciences and permits flexibility to meet particular interests of the student. Courses in biochemistry are based on general, organic and analytical chemistry. The undergraduate curriculum also provides students with sufficient background in the sciences of mathematics, physical sciences, and clinical studies for graduate study in most disciplines of contemporary science such as agriculture or medicine and other allied health subjects, and is excellent for pre-professional students. The Department’s research activities provide opportunities for students to employ the advancement of undergraduate majors to improve their professional competence.

Minor in Biochemistry and Molecular Biology

This minor is designed to give students a firm background in the fundamentals of Biochemistry and Molecular Biology and to develop critical thinking skills for the interpretation of new findings in these disciplines. Students will gain primary knowledge in modern biochemistry through prerequisite courses (BIOC 3713 and BIOC 3813). Hands on training with experimental tools of these disciplines will be emphasized during the Biochemistry and Molecular Biology laboratory course (BIOC 3723). The knowledge gained by this minor gives a science educator, a laboratory technician, an industry employee or a life science researcher the tools they need to apply these disciplines. This minor will also demonstrate competency in these disciplines to post-graduate health institutions.

Graduate Programs

Many career opportunities in biochemistry require advanced coursework, and so part of the Biochemistry and Molecular Biology curriculum is focused on its graduate program leading to the MS or PhD degree. This graduate program is also an integral part of the extensive basic research activities supported by the Oklahoma Agricultural Experiment Station.

Prerequisites

Although a BS in Chemistry or Biochemistry is preferred, students with strong backgrounds in other biological or physical science disciplines are eligible for the graduate programs in Biochemistry and Molecular Biology. Individuals not having at least eight semester credit hours each of organic chemistry and calculus, plus four credit hours each of analytical and physical chemistry, may be accepted, but will have to make up deficiencies. The results of the three general GRE exams (verbal, quantitative, analytical) are required for entrance to the Graduate College. The preferred minimum GRE scores required for admission to the Biochemistry and Molecular Biology graduate program are: Verbal Reasoning 154 (64%); Quantitative Reasoning 153 (65%); and Analytical Writing 4.0 (48%).

Degree Requirements

A more detailed description of the graduate study program in Biochemistry and Molecular Biology is available on the Department’s website: http://biochemistry.okstate.edu/graduate-program. The requirements listed below complement the general graduate requirements described in the “Graduate College” section of the Catalog. All Biochemistry and Molecular Biology graduate students are expected to attend and participate in the Department’s Graduate Student Association Journal Club and the Department’s Seminar Series throughout the academic year.

The Master of Science Degree

Twenty-four (24) credit hours of formal graduate courses are required, including BIOC 5002, 5753, 5824, 5853, and 5930. In addition, a student must present an acceptable research thesis (six hours of BIOC 5000) and pass a final oral examination covering their thesis work and related material. Research advisers are selected at the end of the student’s 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 MS plan requires thirty (30) credit hours of coursework and two (2) hours of research. The non-thesis MS is not recommended for students wishing to pursue a PhD.

The Doctor of Philosophy Degree

The PhD program course requirements are determined with the assistance and approval of the student’s advisory committee and are based on whether a BS or MS has previously been earned: (a) a minimum of total of (60) graduate credit hours if a student enters the PhD program having earned an MS in a related discipline: (b) a minimum total of ninety (90) graduate credits are required if a student enters the PhD program having earned not higher than a BS in a related discipline.

A formal “Plan of Study” with a minimum of 30 credit hours of graduate coursework, a minimum of 15 credit hours of research, and a minimum total of (a) 60 credit hours or (b) 90 credit hours must be approved by the student’s advisory committee and submitted to the OSU Graduate College before completing (a) 17 credit hours or (b) 28 credit hours of graduate study. The student’s advisory committee is selected at the end of the student’s second semester. All graduate students must maintain a B average in their graduate coursework. A grade of C in a single graduate course can place the student on academic probation.

The Department offers research experience in a variety of areas. Formal PhD program graduate coursework includes all of the courses listed for the MS degree, at least four of the advanced graduate courses in biochemistry (6000 level) including BIOC 6740, and additional courses and lab experience appropriate to the student’s interests. Each student will take a series of preliminary examinations in 2 areas of his or her major. Each area must be passed with a grade of A or better.

Each student also presents and defends their research thesis proposal sometime in their 4th -5th semester, and at the end of their program presents their research and defends their dissertation in a final oral examination. The doctoral dissertation must contain a substantial original contribution to the discipline of biochemistry and molecular biology.

Bioinformatics Graduate Certificate Program

The Department of Biochemistry and Molecular Biology also offers the Bioinformatics Graduate Certificate Program - a multi-disciplinary program that involves faculty in Departments across the University. This Program’s mission is to train post-baccalaureate students in the techniques required to generate, analyze, and interpret complex biologically-derived data sets. The Graduate Certificate in Bioinformatics requires completion of 16 credit hours of course work eligible for graduate credit. A minimum of 12 credit hours must be at the 5000 level or above. Required courses include 9 credit hours from the core areas of life sciences, statistics and computer sciences. Additional information on this Certificate Program is available online: http://www.bioinformatics.okstate.edu.

Review Process for Admission

The Department’s Graduate Studies Committee reviews all eligible applications for the graduate program in Biochemistry and Molecular Biology. To be eligible for committee review, each applicant must submit an application for admission to the Graduate College, along with transcripts of all academic records, GRE scores and TOEFL scores if their undergraduate education was in a language other than English. Applicants must submit to the Department three reference letters, a current resume, and a statement of purpose.

Biosystems and Agricultural Engineering

Daniel L. Thomas, PhD, PE—Professor and Head

The Department 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 create and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of food, feed, fiber and other biological products, while at the same time providing for a quality environment and preserving and protecting natural resources. Biosystems engineers directly address problems and opportunities related to food, water, energy, and the environment - all of which are critical to the quality of life in our society. Subject-matter specialization is provided through the following four undergraduate option areas: bioprocessing, environment and natural resources, biomechanical, and bioprocessing and biotechnology.

Biosystems engineering courses integrate engineering sciences, physical sciences, and biological sciences, and teach students to address real-world challenges. With the guidance of experienced faculty, students work both as individuals and in teams to design creative solutions to complex problems.

The overall objective of the undergraduate biosystems engineering degree programs is to provide the comprehensive education necessary to prepare students for successful, productive and rewarding careers in engineering for agricultural, food and biological systems.

Within a few years of graduation, Biosystems Engineering program graduates will become top professionals, managers or leaders in a wide variety of
industries and organizations involved with Biosystems engineering, where they apply discovery, problem solving, and leadership skills for the benefit of their organization and the society at large.

The undergraduate educational program is divided into two components—pre-professional and professional. In the pre-professional portion of the biosystems engineering program (usually equivalent to two years of study) the focus is on the underlying biological, physical, chemical and mathematical aspects of engineering, supplemented by appropriate general education courses in English, social sciences and humanities. Students who demonstrate proficiency in this portion of the program are eligible for admission to the professional school in Biosystems Engineering.

The professional school of biosystems engineering curriculum (typically two years) builds systematically upon the scientific knowledge acquired in the pre-professional curriculum. In professional school, students have the opportunity to focus on the option areas given above. The degree is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology under agricultural engineering and similarly named programs.

Each professional school course builds upon preceding engineering courses to develop in the student the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work incorporates the social and economic aspects of technical problems, and stresses the responsibilities as engineering professionals to both society and victims of occupational and public safety. The program culminates in senior year design courses in which students integrate the analysis, synthesis and other abilities they have developed throughout the four years of their study. At this capstone experience. At this point, they are able to design components, systems and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. The students have also developed and displayed the ability to conduct experimental work essential to specific studies and to analyze the experimental results and draw meaningful conclusions.

An integral part of this education continuum from basic science through comprehensive engineering design is learning experiences that facilitate the students’ abilities to function effectively in both individual and team environments. Moreover, the program provides all graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and used as a part of their problem-solving experiences. Finally, the students’ experiences in solving ever-more-challenging problems enable them to continue to learn independently throughout their professional careers.

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 engineering firms, and agricultural and food equipment industries. Biosystems engineers are employed throughout the U.S. as well as internationally.

Students interested in a degree in Biosystems Engineering may initially enroll in the College of Engineering, Architecture and Technology or the College of Agricultural Sciences and Natural Resources. Through either college, they will be assigned a biosystems engineering advisor.

Graduate Programs

The Department of Biosystems and Agricultural Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees in Biosystems Engineering. These degrees emphasize research and development.

Excellent laboratory and computer facilities are available for students to explore research and design in such areas as bioprocessing and food engineering, machine vision, sensor and control technology, waste management and utilization, hydrology, water quality, porous media flow, and intelligent systems for agricultural machine design and production.

Research projects are supported by the Oklahoma Agricultural Experiment Station and by state, federal and private grants and contracts. Well-trained faculty members, many of whom are registered professional engineers with research and consulting experience in design engineering, the graduate students, graduate 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 and conduct an experimental investigation, manage the project to completion and report the results through peer-reviewed papers and professional presentations.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Engineering Accreditation Commission of ABET (www.abet.org). Students without accredited degrees may be admitted provisionally and may be required to take additional courses. A student must be accepted by an adviser in the department prior to official admission to the graduate program.

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

Entomology and Plant Pathology

Phillip G. Maults, Jr., PhD—Professor and Head

The mission for the Department of Entomology and Plant Pathology is to discover, develop and disseminate science-based knowledge concerning arthropods and plant pathogens. Entomology is the science and study of insects and related arthropods. Plant Pathology is the science and study of bacteria, fungi, viruses, and nematodes that cause diseases in plants. A strong academic background in the physical and biological sciences is essential for success in both disciplines. Research and education programs range from basic studies of cellular, physiological, and genetic aspects to broad ecological and population studies, and focus on the development of practical pest management strategies. The undergraduate program in entomology leads to the BS in Entomology and offers students opportunities to explore the diversity of nature through the study of arthropods and their interactions with plants, animals, and human culture.

Specialized course work in entomology includes insect identification, biology, ecology, physiology, biochemistry, population dynamics, medical and veterinary entomology, and insect pest management.

Plant pathology as a discipline encompasses the science required to understand the causes of plant diseases as well as prevention and controlling diseases. Undergraduate level courses are available in Plant Pathology and are valuable additions to programs in entomology, horticulture, agronomy, ecology and botany. Specialized course work in plant pathology includes pathogen identification, genetics, host pathogen physiology, biotechnology, molecular genetics, and disease management.

There are many, and diverse, career opportunities for graduates of these programs, including positions in government and private organizations in crop and livestock production, stored products such as grains and processed foods and protecting structural systems such as houses from termites and agricultural biotechnology. Undergraduate options in entomology include insect biology and behavior, aquaculture, and pre-veterinary sciences. Undergraduates of the entomology program are prepared to enter graduate programs in several disciplines, including entomology and plant pathology and have been successful in seeking and receiving professional degrees in medical and veterinary science programs. Others gain employment with private industry, research laboratories or county, state or federal agencies. Some develop their own businesses as consultants and/or entrepreneurs.

Minor in Entomology

This minor is designed to provide students with a basic understanding of insect biology, ecology, and classification. Students are also introduced on applications related to ecosystem function, conservation, and agricultural impacts. Directed electives in this major allow students to explore aspects of insect behavior, aquatic entomology, specific applications of entomology in horticulture, forestry, agronomy, and stored product scenarios. Requirements of the minor include 15 hours from core courses.

Minor in Pest Management

This minor is designed to introduce students to pests including insects, plant pathogens, and weeds that damage, reduce the quality, or increase production costs of agricultural crops or livestock, turf or ornamental plants, and trees. Integrated management methods for these pests will be presented including cultural, biological, and chemical control strategies. The minor is intended for students majoring in horticulture, plant and soil science, natural resource ecology and management, animal science, environmental science, entomology, or other majors in biology.

Requirements of the minor include 18 hours with 9-12 hours from core courses.

Graduate Programs

The Department of Entomology and Plant Pathology offers programs of study that lead to the MS of Entomology and Plant Pathology, the PhD in Entomology or the PhD in Plant Pathology. These programs offer students opportunities to specialize in a wide range of basic or applied research fields. To qualify for graduate study in entomology and/or plant pathology an applicant should obtain a solid background in the basic sciences, especially biology, chemistry, mathematics, English and communications skills. All requirements of the Graduate College must be satisfied for entry to the graduate programs. In addition, applicants for graduate programs should take the Graduate Record Examination and submit their scores. Students applying to the graduate program must be accepted into a research program by a major professor. The applicant must secure appropriate financial support in the form of a scholarship, fellowship, or graduate assistantship to be negotiated with the major professor and department and be approved by the departmental screening committee and department head before being admitted to the Department. Each graduate student is under the direction of the major professor as adviser and a selected faculty advisory committee. The program of study will be adapted to the individual’s needs within departmental and Graduate College guidelines.

Graduate students are required to meet with their advisory committees every six months for program reports and examinations. Each student must propose a program of study and research approved by the student’s committee and, if applicable, must submit an approved thesis or dissertation, and present a public defense. Students supported as half-time research assistants are expected to be active participants in the research projects of their major professors. Additional information regarding the graduate programs in Entomology and Plant Pathology may be obtained from the department’s website at, www.entoplp.okstate.edu.
Environmental Science
Brian J. Carter, PhD—Professor and Director
The College of Agricultural Sciences and Natural Resources offers an undergraduate major in environmental sciences. This interdisciplinary program is designed to improve the current and future welfare of the human race through understanding environmental policies based on scientific principles in accordance with the true benefits and costs as evaluated by an informed society. As an interdisciplinary and science-oriented major, the student takes courses in biology, chemistry, math, physics, statistics, and social sciences. The student may choose one of three areas of emphasis (options): Environmental Policy, Natural Resources, or Water Resources. Depending on the option, upper-division course work will involve problem-solving work in water and soil quality, economic and social policy, science resource management and engineering. The student will also be exposed in general education subjects, including communications, philosophy, ethics and sociology.

A primary goal is to enable graduates to solve environmental problems based on scientific principles and in accordance with society's needs. Successful completion of this major earns the student the Bachelor of Science in Agricultural Sciences and Natural Resource degree.

The environmental sciences undergraduate major is directly supported by faculty from the departments of Agricultural Economics, BioSystems and Agricultural Engineering, Entomology and Plant Pathology, Horticulture and Landscape Architecture, Natural Resource Ecology and Management, and Plant and Soil Sciences. The major and its students also benefit from working in and out of the classroom or laboratory with faculty who are conducting cutting-edge research related to environmental problems through the Freshman Research Scholars Program.

Graduates work in such areas as land-use planning, environmental management, natural resources management, waste disposal, water and soil quality, environmental remediation and policy analysis. Industries associated with the extraction, production, 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 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.

Horticulture and Landscape Architecture
Janet C. Cole, PhD—Regents Professor and Head
Horticulture is the science, business 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 management of these plant materials in the landscape. Horticulture is involved with the production and processing of a significant part of the nation's food supply. It provides a major source of the beauty in and around homes, cities, parks, highways, golf courses and other public areas. Educational opportunities for study in horticulture exist in 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, conservation of resources, harvesting, processing and storage. Students can prepare themselves for careers in public garden management (arboreta, parks and zoos), golf course management, horticulture business, environment and sustainability areas, sales and marketing, production, teaching, extension and research.

Landscape Architecture is an environmental design discipline. It applies artistic and scientific principles to the design, planning, and management of both natural and built environments. Landscape architects work a wide variety of projects including garden design, residential design, community planning, urban design, parks and recreation, commercial /campus design, and sustainable site design. The design process involves creative expression that comes from an understanding of the context of site (or landscape), natural systems, cultural systems and social dynamics. It requires one to interpret, imagine, draw, conceptualize, synthesize, and construct project ideas that transform both the landscapes and the users of those landscapes. As issues of sustainability are becoming more critical, Landscape Architects are poised to address them, as they design the interface between humankind and the urban, suburban, and natural environment.

The Department of Horticulture and Landscape Architecture offers undergraduate programs leading to the following degrees: BS in Horticulture, BS in Landscape Management and BLA in Landscape Architecture. www.hortla.okstate.edu

Horticulture Science emphasis is on preparing students for science-based careers, including laboratory science or graduate study. This option provides the training for research in production, maintenance and preservation of fruits, nuts, vegetables, nursery crops, flower crops, etc. Training can be general or be chosen to emphasize a particular commodity area of horticulture. Students learn plant care techniques and the role plants and landscape applications play in sustaining the environment.

Horticulture Business option features opportunity to combine horticulture with principles of running a business. A built-in requirement for a formal academic minor in a business area is a feature of this option.

Turf Management provides the training for turfgrass production and for management of turfgrass in golf courses, parks, athletic fields, home lawns, airports and along highways.

Public Horticulture focuses on the people-plant interface, particularly in urban settings. Students may choose to specialize in either garden management or urban horticulture. The program is appropriate for those interested in careers in arboretas, botanic gardens, zoos, horticultural societies, park systems, museums, habitat creation and restoration (especially disturbed areas and/or wetlands) civic and community centers, and specialty crop production in developed areas. The option can also lead to graduate study. Students have the opportunity to be involved in The Botanic Garden at OSU and the department’s television show, Oklahoma Gardening.

Landscape Architecture is the study of artistic, scientific and technical principles as they are applied to landscape planning, design, and management services. Landscape architects develop detailed landscape plans to be aesthetically pleasing, functional, and compatible with the built and natural environment. Students will experience a strong landscape design curriculum that is supported with courses in art, construction, horticulture, ecology, environmental science, and social science. This five-year Bachelor of Landscape Architecture (BLA) degree focuses on professional practice. This degree is nationally accredited by the Landscape Architecture Accreditation Board (LAAB). Study plans may be tailored to the individual with emphasis in areas in Design, Environmental Planning, and Horticulture. Typical employers of landscape architects include landscape architecture firms, architectural / engineering firms and government agencies dealing with land planning, environmental and conservation applications, urban planning and parks/recreation.

Landscape Management emphasizes the construction and management phases of landscape development, including plants, environmental applications, and structures. This four-year program leads to a BS degree accredited by the National Association of Landscape Professionals (NALP). Courses include basic landscape architectural design, construction technology, business and horticulture. Students may emphasize either landscape design or business management. Students emphasizing business management may complete a minor in Management through the OSU Spears School of Business. Graduates are employed by landscape contracting companies, design-build firms, landscape maintenance companies, landscape nurseries, and governmental agencies.

Minor in Horticulture. Additional formal training in horticulture can benefit students in career areas as diverse as education, interior design, or entrepreneurship. The minor includes 16 hours of core courses in soil science, plant biology, and horticultural science, along with advanced cross-commodity applications in plant propagation. The core provides the basic prerequisites for further study. Students then select at least eight hours of controlled electives in horticulture according to their areas of interest. A total of 23 hours is required for the minor.

Graduate Programs
The department offers programs of study leading to the degrees of Master of Science in Horticulture (with areas of specialization in Horticultural Science, Sustainable Landscape Design and Management, Phytochemistry and Turfgrass Science) Doctoral students can participate in multidisciplinary PhD programs in Crop Science, Environmental Science, Food Science, and Plant Science. Areas of study include floriculture crops, fruit and nut crops, vegetables, ornamental nursery crops, and turf. In addition to commodity-oriented specialties, students may emphasize food processing, environmental applications, plant extraction applications, postharvest physiology, or stress physiology disciplines. Applicants should indicate their interest area(s). Research opportunities range from whole plant production/management studies to fundamental cellular studies. Additional information on programs, application procedures, and financial assistance is available at: www.hortla.okstate.edu/students/graduateprogram/.

Prerequisites. Admission requires a bachelor's degree in Horticulture, Landscape Architecture, 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 proficiency in accordance with the advisory committee's guidance. In addition to Graduate College requirements, applicants must submit official GRE scores, a statement of research and career interests, and three letters of reference.

Admission to the program requires approval by the graduate committee, a departmental adviser on the Graduate Faculty, the department head, and Graduate College. The program of study and research will be directed by the student's graduate adviser and advisory committee.

International Agriculture
Shida R. Henneberry, PhD—Professor and Director
Master of Agriculture in International Agriculture (MAIA). The Master of Agriculture in International Agriculture (MAIA) is a multidisciplinary degree
program that provides students the diverse background necessary to design, implement, and manage agricultural programs in developed and developing areas. The program prepares candidates for positions in the public and private sectors related to international agricultural development and marketing. Graduates work in international agribusinesses, non-profit organizations, development agencies, government, and international agricultural extension, agricultural trade associations and commodity groups and other positions in global agriculture. Others pursue a personal desire to make a difference in the world by entering the Peace Corps, doing agricultural development work in developing countries, and working in areas recovering from a natural disaster. The MAIA is for students who prefer to blend theory and practice to improve the lives of people, develop professional skills and network through an international agricultural experience, develop a focus area to support professional goals, develop broader understanding of world cultures and issues and engage in international travel.

Three alternatives exist for satisfying requirements for the MAIA degree:

1. 32 credit hours, including two credit hours for a formal report,
2. 36 credit hours and a creative component, and
3. 36 credit hours, including six hours for a professional internship.

A minimum of 21 credit hours must be earned at the 5000 level or above. The creative component, research for formal report, and professional internship are expected to be in the area of international agriculture. Each student must take 17 semester credit hours of approved core courses, a minimum of 12 semester credit hours of focus area courses, and at least three hours of electives. Each student is required to have an international experience of four weeks or longer.

Master of Science in International Agriculture (MSIA) The Master of Science in International Agriculture is designed to prepare candidates for positions in the public and private sectors related to agricultural sciences and natural resources, or for continuation in a Ph.D. program. The MSIA accommodates those students who want to take their theoretical training beyond the scope of the research. This program will provide students the theoretical, science, and research backgrounds necessary to design, implement, and manage agricultural programs in developed and developing countries. It allows participants to blend theory and practice to improve the lives of people. Advanced study leading to the Master of Science degree in the field of International Agriculture prepares students for such professional careers as business analyst, international trade and development specialist, college-level educator, agricultural extension specialist, and professional work with non-profit organizations, government sectors, and agricultural commodity groups. The program is multidisciplinary, allowing students the freedom to focus on the area of study they choose.

Three alternatives exist for satisfying requirements for the M.S. degree:

1. With thesis, 30 credit hours, consisting of 24 hours of course work and six hours for a thesis*
2. With report, 32 credit hours, consisting of 30 hours of course work and two hours of research*
3. With no thesis or report, 32 credit hours of course work and a creative component*

Degree candidates are expected to conduct research related to a topic on international agriculture. The prerequisites include two courses in statistics, mathematics, or quantitative analysis; nine additional semester credit hours in agricultural sciences and natural resources or related areas.

Natural Resource Ecology and Management Robert J. (Jim) Ansley, Jr., PhD—Professor and Head Faculty, The Department of Natural Resource Ecology and Management (NREM) have expertise in conducting interdisciplinary instruction, research, and extension education which focus on the natural resources of fisheries, forests, rangeland, and wildlife within and beyond the boundaries of Oklahoma. Increased public understanding of the ecology and management of these natural resources which are important in agriculture, hunting and fishing, ecotourism, forest production and use, as well as the conservation of wildlife habitat is an important goal of the faculty in NREM.

The NREM faculty support undergraduate and graduate programs in Fire Ecology, Fisheries, Forestry, Rangeland, and Wildlife. The NREM curriculum prepares students to plan, implement, and research the management, protection, and sustainable use of natural resources within Oklahoma and throughout the world. The department provides an integrated education in renewable natural resource management, conservation, and utilization, as well as a valuable perspective for understanding and solving critical contemporary environmental problems at local, regional, and global scales. Courses in NREM study options fulfill the requirements for many applied and professional careers in the natural resource disciplines, including preparation for graduate school, certification with the Society of American Foresters, The Wildlife Society and The American Fisheries Society. Graduates may be employed by governmental agencies, non-profit organizations, private agencies or individuals. Federal agencies hiring NREM graduates include U.S. Department of Agriculture, U.S. Forest Service, U.S. Bureau of Land Management, U.S. Geological Survey, U.S. Fish and Wildlife Service, Agricultural Research Service, Bureau of Indian Affairs, National Park Service, Animal and Plant Health Inspection Service, and the Natural Resources Conservation Service. In addition, state, county, and municipal governments employ NREM graduates in a variety of resource management consultant, restoration, service, and technical positions.

Natural Resource Ecology and Management Degree Options.

Fire Ecology and Management option was developed in response to the need for understanding the ecological role and management of wildland fire in natural ecosystems, or the importance and implementation of prescribed fire in land management. This option offers students the opportunity to accomplish specific land management objectives through the proper use of prescribed fire. The curriculum combines experience with prescribed fire plans, policy and law, wildfire behavior, equipment, professional skills, and post-burn management. In addition, students will be assisted in completing federal fire training requirements.

Fisheries and Aquatic Ecology is an option designed for students with interest in the management of fish populations and habitats. Courses offer research techniques and methodology in fisheries science, including sampling design, habitat measurements, sampling techniques and abundance estimation, age and growth analysis, recreational surveys, data analysis and report writing.

Forest Ecology and Management emphasizes the science-based conservation and management of forest lands, ecosystems and related natural resources. Students gain the skills that are necessary for the measurement, assessment, and valuation of natural resources and the evaluation of management strategies for forest and related wildlife. Successful completion of the curriculum will provide competency in the general areas of basic science, forest ecology, forest mensuration, forest economics, natural resource policy, decision-making and problem solving, and communications. The option is accredited by the Society of American Foresters (SAF), the specialized accrediting body for forestry programs in the U.S. Requirements for this option include two successful two-week, three-week field camps in which students are scheduled to follow the sophomore and junior years, and are held annually in diverse forest settings. Field forestry skills, forest ecology, integrated natural resource management, and state-of-the-art operations are emphasized at camp.

Natural History and Conservation option provides a broadly integrated science background in the classification, biology and ecology of plants and animals with an emphasis on natural history and conservation. The option specifically prepares students for careers in environmental stewardship and outdoor education and stresses the development of excellent communications, interpersonal, and leadership skills.

Rangeland Ecology and Management program emphasizes understanding management of grasslands, shrub lands, and forests for forage and habitat production. This includes the effects of grazing, fire, and other disturbances on biotic and abiotic processes. Students learn to integrate their knowledge of soil, water and vegetation attributes into management of public or private wild lands for multiple uses.

Wildlife Ecology and Management option provides insight into the biological basis for management of wildlife populations and habitats, with emphasis on current management problems. This option combines research techniques, including aging and sexing, wildlife and vegetation sampling, and wildlife population and habitat analysis with the methodology of wildlife science.

Wildlife Biology and Preveterinary Science option provides ecological background and training in natural wildlife science and population dynamics in addition to the basic sciences necessary to prepare students for graduate education in wildlife biology or veterinary medicine. The option combines research and management training in population ecology with basic biology and chemistry. Students entering the NREM department are encouraged to join and become active members of one of the many student organizations: Society of American Foresters, Society for Range Management, The Wildlife Society, and the American Fisheries Society. Participation in one or more of these organizations provides students the opportunity to attend state, regional, or national meetings where they will gain valuable advantages through networking, student competitions, and interacting with various career-related activities.

Graduate Programs

The department offers the MS and Ph.D degrees in Natural Resource Ecology and Management with specializations in Fisheries and Aquatic Ecology, Forest Resources, Rangeland Ecology and Management, and Wildlife Ecology and Management. In addition, students may work toward the MS and PhD degrees in the Soil Science Program and the graduate students in the Plant Science Graduate Program with faculty members from the Department.

The overall goals of the Department are to provide high quality advanced training and instruction in the application of the scientific method to problems in natural resource ecology and management. This includes problem analysis and solution, design of research methods, synthesis of results and communication of findings. The Department strives to develop the capability for original and creative work under the guidance of established professionals and scientists. Graduate instruction is a critical component of the research, instruction and extension missions of the Department.
Students work directly with a member of the faculty to design a program of study to serve individual career goals. The prerequisite for graduate study in the Department is a bachelor’s degree in an area aligned with the student’s research interests with a minimum overall GPA of 3.00. Please refer to the website nrem.okstate.edu for a full description of the application process. A student must be accepted by a member of the Department’s faculty prior to official admission to the program.

Plant and Soil Sciences
Jeffrey T. Edwards, PhD—Professor and Head
The goal of the department is to meet societal needs for food, fiber, energy, and intrinsic value related to the conservation and management of plant and soil resources. Teaching, research and extension efforts are designed to assist decision makers in matters regarding land management.

Undergraduate students select an option of study from: agronomic business, crop production and management, plant biotechnology and improvement, or soil and water resources. Students may choose to specialize in an area such as: entrepreneurship, forage and livestock production, pest management, plant genetics, precision agriculture, or environmental management. In addition, students can fulfill prerequisites for professional programs such as pharmacy school. Students interested in professional certification will complete the necessary course requirements in their degree programs. Students have flexibility to work with their academic advisers to develop a plan of study to suit their interests. Many undergraduate students work with the research faculty on projects providing the student an opportunity to assist in gathering new information related to plant breeding and genetics, biotechnology, environmental remediation, plant physiology, crop production, weed science, soil nutrient management, soil chemistry, soil physics, water quality, and land restoration.

Upon completion of a Bachelor of Science program, students are employed by private firms, public institutions, state and federal agencies, or non-profit organizations that require personnel with expertise in plant and soil systems. Typical careers include: federal employment in soil and rangeland conservation; crop consulting; technical sales and service for seed, fertilizer or agricultural chemical supply companies; farm or ranch operation; research positions as plant and soil scientists with federal agencies, state agricultural 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, equipment, agricultural chemicals and other agricultural supplies and services. Demand for individuals with experience in plant and soil sciences will continue as long as society demands a safe, secure food supply balanced with a desire to conserve natural resources.

Minor in Agronomy or Soil Science. The Department of Plant and Soil Sciences offers two minors, Agronomy (24 hours) and Soil Science (19 hours). Students pursuing a minor in Agronomy will take courses in areas that are most important for understanding the science of crop production, including genetics and biotechnology, weed science, and nutrient management in order to prepare them for careers that support crop production. The Soil Science minor has a great deal of flexibility (12 credits of controlled electives) that will allow students to explore diverse aspects of soils ranging from chemistry to conservation while helping them prepare for a variety of environment-related careers.

Graduate Programs
Programs of course work and research are offered leading to the Master of Science degree in plant and soil sciences. A Doctor of Philosophy degree can be attained in Crop Science or Soil Science. Specific programs are available in the areas of plant breeding and molecular biology, biotechnology, bioenergy, environmental remediation, forage and pasture management, weed science, crop physiology, crop management, conservation cropping systems, soil morphology and genesis, soil microbiology, soil fertility and plant nutrition, soil physics, soil-water management, soil chemistry, soil and water quality, and waste management. Applicants should indicate their specific area of interest upon application. Plant and soil sciences faculty also serve on advisory committees for the Environmental Science and Plant Science interdisciplinary degree programs.

The degree plans of study for the Doctor of Philosophy degree in crop science and soil science are developed individually for each candidate and must be approved by the students advisory committee. Doctoral programs in crop science and soil science require 60 credit hours beyond the MS degree, including a minimum of 15 credit hours of PLNT or SOIL 6000 (Dissertation). All students must 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.
College of Arts and Sciences

College Administration
Bret S. Daniłowicz, PhD—Dean
Bruce C. Crauder, PhD—Associate Dean for Instruction and Personnel
Thomas A. Wikle, PhD—Associate Dean for Academic Programs
Larry L. Mullins, PhD—Associate Dean for Research
Amy Martindale, EdD—Assistant Dean for Student Academic Services
Bobbi Kay Lewis, PhD—Assistant Dean for Outreach
Lauren Kidd—Development Director
Renée G. Tefertiller—Fiscal Affairs Director

Campus Address and Phone:
201 Life Sciences East, Stillwater, OK 74078
405.744.5663 Fax: 405.744.1797
Website: http://cas.okstate.edu/

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

Accreditation
Refer to departmental listings that follow for information on accreditation of specific programs.

High School Preparation
In addition to the curricular requirements for admission specified by the Oklahoma State Regents for Higher Education, The College of Arts and Sciences strongly recommends that high school students have a fourth year of mathematics; a third year of laboratory science; at least two years of a single foreign language; one year of arts such as music, theatre, or studio art, and computer literacy.

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 or access the OSU Internet site for a list of available scholarships. Arts and Sciences students are also encouraged to apply for the variety of scholarships available through the University’s Office of Scholarships and Financial Aid.

Student Success Center
The Arts and Sciences Student Success Center is comprised of four units listed below. Student Academic Services includes coordination of pre-professional advising is provided through the Center, so regardless of major, pre-law students may consult with an advisor in Student Academic Services, and pre-health students may consult with an advisor in Pre-Health Advising.

Student Academic Services. The academic advising process in Arts and Sciences is coordinated by Student Academic Services. The advising staff in Student Academic Services advises freshmen and undecided students. Departmental advisors provide advising for students who have declared their majors. The general education program in the College of Arts and Sciences allows undecided freshmen to make progress toward most degrees for up to three semesters, while exploring possible fields of study with an academic advisor. The responsibility for satisfying all requirements for a degree and for ensuring that a degree plan has been submitted rests with the student. Advisors assist students in curriculum planning, and students are encouraged to consult fully with their advisors.

The Student Academic Services staff represents the College in the University’s recruiting activities and represents the dean in such matters as petitions for excessive hours, 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.

Career Services. The primary goal of A&S Career Services is to promote academic excellence to enhance career planning and lifelong success. Services offered include career counseling, job and internship search strategies, and assistance with preparation of resumes and cover letters. Presentations on a wide-range of career-related topics are offered to classes and clubs.

Outreach. The mission of A&S Outreach is to extend intellectual resources, disseminate knowledge to learners at any time and any place, and provide lifelong learning opportunities. This is accomplished through offering high school and collegiate distance learning courses, international credit courses, and field trip courses. Outreach also coordinates academic conferences, industry workshops and seminars, and cultural outreach opportunities.

Academic Programs

Undergraduate Programs. Requirements for all degree programs and options are detailed in Undergraduate Programs and Requirements publication available online at registrar.okstate.edu. 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 (BA):
American studies
art and art history
economics
English
French
geography
German
history
liberal studies
mathematics
multimedia journalism
music
philosophy
political science
psychology
sociology
Spanish
sports media
strategic communication
theatre

Bachelor of Science (BS):
biochemistry
biological science
chemistry
communication sciences and disorders
computer science
economics
geography
geospatial information science
geology
liberal studies
mathematics
microbiology/cell and molecular biology
multimedia journalism
physics
physiology
plant biology
political science
psychology
sociology
sports media
statistics
strategic communication
zoology

Bachelor of Fine Arts (BFA):
art (graphic design and studio)

Bachelor of Music (BM):
elective studies in business
music education (instrumental/vocal certification)
performance

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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 could be higher depending 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 advisor to submit a degree plan for the second degree, clearly heading “second degree,” and showing how all the requirements of the second degree are to be satisfied. The second degree plan should be sent to the College of Arts and Sciences Office of Student Academic Services no later than 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.

Second Majors and Minors. A student majoring in one field may also complete 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 specifications satisfy the requirements of the degrees in which the second major or minor is sought, or from the Office of Student Academic Services. The student must formally declare each major and minor by completing a declaration form with each respective college. During the semester in which the student is enrolled in courses that will complete the second major or minor the student should ask the advisor in the second major or minor to submit certification of completion of the required courses to the Office of Student Academic Services in the College of Arts and Sciences.

Graduate Programs. Twenty-five master's degrees are offered in the College along with 12 doctoral degrees. For details, see the departmental entries that follow or consult the “Graduate College” section in the Catalog.

Special Academic Programs

The Honors College. The College of Arts and Sciences has offered honors courses since the 1960s and has the greatest number of students and faculty participating in The Honors College at Oklahoma State University. The Honors College 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 College 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 College awards are available to A&S students—the General Honors award, the Departmental Honors award in the student’s major field, and The Honors College degree. These awards are reflected on the student's transcript and a special honors diploma is awarded to students completing the requirements for The Honors College degree.

Priority enrollment is provided for students who are active in The Honors College. 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. For eligibility requirements, visit The Honors College website at honors.okstate.edu.

Bachelor of University Studies (BUS). The BUS in the College of Arts and Sciences allows students with unique educational objectives that cannot be fulfilled by any of the existing degree programs to design an individual plan of study to fit the student’s particular needs. BUS plans must be approved by the Assistant Dean for A&S Student Academic Services, and the Office of the Provost and Senior Vice-President.

Geographic Information Systems Certificate. The Geographic Information Systems (GIS) certificate provides a specialized course of study for interested students. The GIS certificate program provides students with a theoretical foundation concerning the rapidly growing field of GIS. The program is open to any student at Oklahoma State University. For more information, contact the GIS Certificate coordinator in the Department of Geography, 337 Murray Hall.

High School Teaching Preparation. Students earning degrees in the College of Arts and Sciences may prepare for certain courses, receive state licensure for teaching in the secondary schools. Full details may be obtained from the OSU Professional Education Unit in the College of Education, 325 Williams.

It is possible to qualify for teaching licensure and the bachelor's degree within the minimum semester credit hours required for graduation. If not possible, students may meet the requirements for the degree and then complete the licensure requirements by taking additional courses.

Students who wish to qualify for teaching licensure should consult as early as possible with the advisor in their fields of interest, and apply for admission to professional education as soon as possible, preferably before the end of their sophomore year. Full teaching certification is awarded by the State Department of Education when the candidate has successfully completed a period of teaching in a school system.

OSU Teach and Secondary Teacher Certification (grades 6-12). Students earning a degree in Biological Science, Chemistry, Geology, Mathematics, or Physics may participate in the OSU Teach program by selecting a degree option in secondary teacher certification. OSU Teach offers four-year degrees with a B.S. in the selected discipline and teacher certification at the secondary level. OSU Teach is a collaboration between the College of Education and the College of Arts and Sciences. OSU Teach students begin supervised teaching in K-12 classrooms during their first semester in the program and continue to develop field experiences throughout their coursework, which culminates with apprentice teaching.

Students earning degrees in other majors in the College of Arts and Sciences can also satisfy the requirements for secondary teacher certification by completing certain courses and other requirements. Interested students should see their Arts and Sciences advisor and the OSU Professional Education Unit in the College of Education in room 325 Williams as soon as possible for more information. Students who plan to complete the requirements for certification should apply for admission to professional education immediately in order to incorporate certification requirements into their plan of study. OSU Professional Education recommends a candidate for certification to the State Department of Education when the candidate has successfully completed all requirements. See the Professional Education section of the catalog for more information.

Pre-professional Programs in the Health Professions. Pre-dentistry, Pre-optometry, Pre-pharmacy, Pre-chiropractic and Pre-veterinary Medicine.

The pre-professional curricula for physicians, dentists, podiatrists, optometrists, pharmacists, chiropractors 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 health, 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, pre-professional students may choose courses and a major as freely as any other student in the College of Arts and Sciences. 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.

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 available at prehealth.okstate.edu and in the Pre-health Advising office. The OSU pre-medical and pre-veterinary course requirements are listed in the “Center for Veterinary Health Sciences” and the “Center for Health Sciences” sections of the Catalog. Students whose goal is admission to medical, dental, podiatry, optometry, pharmacy or veterinary programs should consult with a pre-health advisor in the Arts & Sciences Student Success Center, 213 Life Sciences East for information regarding specific requirements of these programs.

Allied Health Professions. The allied health professions for which one can prepare at Oklahoma State University include dental hygiene, nursing, occupational therapy, physical therapy, physician's associate and medical imaging and radiation sciences. The College of Arts and Sciences offers the general education and basic science courses that a student must complete before he or she can be accepted into a professional program. Competitive students may be accepted into these programs after completing 60-90 hours of course work, depending on the health profession. Students whose goal is admission to a professional program in the allied health professions should consult with Pre-health Advising, located in room 213 Life Sciences East for information regarding the specific requirements of particular programs and schools.

Medical Laboratory Science. 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 on 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; letters of recommendation; work and leadership experiences; and applicant's background and motivation as revealed in an application essay.

Law school admissions officers most frequently recommend students include in their undergraduate programs courses which develop strong reading, writing and critical thinking skills as these verbal and analytical abilities 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 advisor in Student Academic Services.
Departmental Clubs and Honor Societies

Advertising Club
Alpha Delta Sigma (advertising honor society)
Alpha Epsilon Delta (health pre-professional honor society)
Alpha Epsilon Rho (national broadcast society)
Alpha Kappa Delta (sociology honor society)
American Association of Petroleum Geologists Student Chapter
American Chemical Society Student Affiliates
American Choral Directors Association
American Institute of Graphic Arts Student Chapter
American Mathematical Society Student Chapter
American Medical Student Association
American Student Dental Association
Army Blades
Arnold Air Society
Art History Organization
Arts and Sciences Student Council
Association for Computing Machinery
Association for Women in Communications
Association for Women in Sports Media
Association of Women in Geoscience
Beta Beta Beta (national biological sciences honor society)
Botanical Society of OU
Christian Medical and Dental Association
Claude Raines Appreciation Society (film society)
Collegiate Music Educators National Conference
Creative Writers Association
Delta Nu Alpha (biochemistry club)
Economics Club
ECO-OSU
English Graduate Student Association
Ethics Club (philosophy)
Forum of Geography Graduate Students
French Club
Friends of the Forms (philosophy)
Frontier Mosaic
Gamers of OU
Gamma Theta Upsilon (geography)
Geology Club
Geological Society of OU
Geology Graduate Student Association
Geophysical Society of OU
German Club
Graphic Design Club
Herpetology Club
History Club
Kappa Kappa Psi (band honor society)
Kappa Tau Alpha (journalism and mass communication honor society)
KXZY (broadcasting)
Latin Dancing and Cultural Club
Mathematics Graduate Student Society
Medieval Studies Group
Microbiology and Molecular Genetics Graduate Student Association
Microbiology Club
Music Student Advisory Council
National Association of Black Journalists
National Society of Pershing Rifles
National Student Speech Language Hearing Association
Oklahoma State Anime Society
Oklahoma State Artist Association
Oklahoma State Secular Society
Oklahoma Student Chapter of the American Fisheries Society
Opera Performance Educational Resource Association
Papyrus (publication society)
Pershing Rifles (military science honor society)
Phi Alpha Delta (pre-law)
Phi Alpha Theta (history honor society)
Phi Beta Kappa
Phi Lambda Upsilon (chemistry honor society)
Phi Mu Alpha Sinfonia (music)
Phi Sigma Tau (philosophy honor society)
Pi Alpha Nu (religious studies)
Pi Mu Epsilon (mathematics)
Pi Sigma Alpha (political science honor society)
Pre-Health Professions Club (chiropractic, pharmacy, occupational and physical therapy, nursing, radiologic technology)
Pre-Optometry Student Association
Pre-Pharmacy Student Association
Pre-Physician Assistant Club
Pi Sigma Alpha (political science honor society)
Psi Chi Honorary (psychology honor society)
Psychology Club
Psychology Graduate Student Association
Public Relations Student Society of America
Quiz Bowl Team

American Studies

Stacy Takacs, PhD—Associate Professor and Director

American Studies examines the history, culture, and society of the United States from a multidisciplinary, multicultural, and transnational perspective. Courses investigate the diverse peoples and ideas that have shaped the nation using an eclectic array of tools — from sociology and political science to history, literature, cultural and media studies. Our curriculum combines structure with latitude in course selection, enabling students to tailor their coursework to fit their personal interests and career goals.

In addition to two required courses in the major (6 credit hours), students must gain a foundation in American literature and history (6 hours each), with additional coursework in the humanities and social sciences (30 credit hours).

In all, the Bachelor of Arts in American Studies requires 48 hours of lower- and upper-division coursework in the field. Students may also minor in American studies, which involves 3 hours in a required American Studies class (AMST 3223 — Theories and Methods of American Studies), 9 hours of additional upper-division AMST-prefix courses, and 6 hours drawn from a list of upper-division courses with a focus relevant to the field of American Studies (18 hours total).

American Studies prides itself on providing students with a well-rounded liberal arts education and the critical thinking and communication skills desired by today’s employers. Our students learn to conduct research, analyze information, speak clearly, write well, and share their knowledge in multiple media formats. Graduates have pursued successful careers in a variety of fields, including education, social work, journalism, media production, marketing, non-profit management, business and the law. With its small class sizes and across-the-board emphasis on analytical writing, American Studies is also perfect preparation for the pursuit of advanced degrees in Literature, History, and the Law, among other areas.

Art, Graphic Design and Art History

Rebecca Briemen, PhD—Professor and Head

The Department of Art, Graphic Design and Art History offers courses for students who are interested in the visual arts or wish to major in studio art, graphic design or art history. Minors are also available in studio art and art history. Fields of concentration include drawing, oil and watercolor painting, printmaking, graphic design, electronic media, photography and digital media, ceramics, jewelry/metalsmithing, sculpture and art history.

The Bachelor of Art (BA) includes options in art history and studio art that can be combined with teacher certification; the Bachelor of Fine Arts (BFA), is a professional degree with options in studio art or graphic design.

In order to qualify for graduation, art majors have grade-point averages in Art Department courses of 2.50 for a BA in Studio Art, 3.0 for a BA in Art History, and 2.75 for a BFA in Studio Art or Graphic Design.

Students who wish to major in graphic design must have a minimum overall GPA of 2.75 to enroll in 2000 level graphic design courses. A student must take three 2000 level courses before their portfolio review (typically in the sophomore year), which is scheduled each spring semester. Students who wish to transfer into the graphic design program with earned credit in these courses are subject to the same review and must submit portfolio materials with application for admission into the program no later than April 1. This portfolio review determines those students who are qualified to proceed to 3000 level graphic design courses. Students who pass the graphic design portfolio review are furthermore required to purchase a MacBook Pro laptop computer for use in the classroom and at home. Specifications are available on the Department’s website, http://art.okstate.edu.

The Department of Art, Graphic Design and Art History is able to offer substantial scholarships at all levels, freshman through senior on a competitive basis.

The Gardiner Gallery of Art in the Bartlett Center for the Visual Arts, the Department’s main building, hosts up to ten exhibitions per year. Exhibitions include the work of national and international artists as well as faculty and students.
Graduate Programs

The Department of Art, Graphic Design and Art History offers an MA Program in Art History. This program differs from most traditional art history programs through its emphasis on intercultural connections, globalization and transnationalism. It involves a broad geo-cultural spectrum with six full-time faculty members who specialize in the art of the Americas, Europe and Asia. In partnership with the OSU Museum of Art, Postal Plaza Gallery and the Gardiner Gallery of Art in the Bartlett Center, students may also take coursework and gain hands-on training in museum and curatorial studies.

Admission Requirements. All applicants must complete the online application (including a statement of purpose, references and TOEFL scores), to be found at grad.okstate.edu. In addition, applicants should also submit three letters of recommendation, a statement of purpose, and a writing sample (5-10 pages; an excerpt from a longer work is acceptable). Prerequisites include five undergraduate courses in art history; foreign language experience is also recommended. While many applicants will have majored in art history, the MA program welcomes applications from graduates with bachelor’s degrees in other fields. MA students may take prerequisites during the program; however, they will not count toward the 30 hours required for graduation.

The Master of Arts Degree. The MA degree requires a minimum of 30 hours of graduate coursework, a thesis, and a defense. Students will select two geographic areas of concentration within the field currently offered in the Department of Art, one to be the major area and the other the minor (the current areas are: Europe, Latin America, East Asia (China and Japan, and the Middle East/Islamic World)). A selection of courses, both lecture and seminar, will be taken in these areas. At least one course outside the department will be in the major area. Generally, the master’s thesis will relate to the cultural connections between the major and minor areas.

Biochemistry and Molecular Biology

John E. Gustafson, Ph.D.—Professor and Head

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, as are evident in contemporary science research.

Biochemists and molecular biologists are concerned with living things and thus, must be fluent in the concepts 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. Our academic programs are designed to integrate these disciplines, preparing students for a wide range of professional careers.

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 genetics techniques.

The Department of Biochemistry and Molecular Biology offers a BS degree in biochemistry through the College of Arts and Sciences and a BS degree in biochemistry and molecular biology with two options through the College of Agricultural Sciences and Natural Resources. An honors program is available in both. The undergraduate curriculum provides a broad background in chemistry and biological sciences and permits flexibility to meet particular interests of the student. Courses in biochemistry are based on general, organic and analytical chemistry. The biochemistry and molecular biology undergraduate curriculum also provides students with sufficient background in the basic sciences of mathematics, physics, chemistry and biology needed for graduate study in most scientific and professional fields. The curriculum is excellent for pre-professional students of medicine, dentistry, pharmacy, and veterinary medicine. The Department’s research activities provide opportunities for part-time employment of undergraduate majors to improve their professional competence.

4+1 Year Masters by Coursework

Students interested in the 4+1 Year Masters by Coursework program are eligible for admission when they have completed or are in the process of completing a minimum of 92 hours of undergraduate coursework including BIOG 3713, 3723, 3813 with a minimum science GPA of 3.0. Application is made to the BMB MS Program through the OSU Graduate College after approval by the BMB Department Head in the spring semester. Students accepted into this program continue to take undergraduate coursework toward their BS degree in Biochemistry (A&S) or Biochemistry and Molecular Biology (CASNR). Students will simultaaneously take appropriate graduate coursework to be applied to the 4+1 program. Students will be admitted to the Graduate College at the beginning of the semester after the semester in which they complete a total of 120 hours, whether these hours count towards the B.S. or the M.S. degree.

Graduate Programs

Many career opportunities in biochemistry require advanced course work, and so part of the Department of Biochemistry and Molecular Biology’s curriculum is focused on its graduate program leading to the MS or PhD degree. This graduate program is also an integral part of the extensive basic research activities supported by the Oklahoma Agricultural Experiment Station.

Prerequisites. Although a BS in chemistry or biochemistry is preferred, students with strong backgrounds in other biological or physical science disciplines are eligible for the graduate programs in Biochemistry and Molecular Biology. Individuals not having at least eight semester credit hours each of organic chemistry and calculus, plus four credit hours each of analytical and physical chemistry, must take appropriate undergraduate courses to make up deficiencies. The results of the three general GRE exams (verbal, quantitative, analytical) are required for entrance to the Graduate College. The preferred minimum GRE scores required for admission to the Biochemistry and Molecular Biology graduate program are: Verbal Reasoning 154 (64%); Quantitative Reasoning 153 (65%); and Analytical Writing 4.0 (48%).

Degree Requirements. A more detailed description of the graduate study program in Biochemistry and Molecular Biology is available on the Department’s website: http://biochemistry.okstate.edu/graduate-program. The requirements listed below complement the general graduate requirements described in the “Graduate College” section of the Catalog. All Biochemistry and Molecular Biology graduate students are expected to attend and participate in the Department’s Graduate Student Association Journal Club and the Department’s Seminar Series throughout the academic year.

The Master of Science Degree. Twenty-four (24) credit hours of formal graduate courses are required, including BIOG 5002, 5753, 5824, 5853, and 5900. In addition, a student must present an acceptable research proposal (six hours of BIOG 5000) and pass a final oral examination covering their thesis work and related material. Research advisors are selected at the end of the student’s first semester.

A non-thesis Master of Science degree is also available. It does not require a research thesis, but requires reporting and approval of the student’s advisory committee and are based on whether a BS or MS has previously been earned:

(a) A minimum total of (60) graduate credits are required if a student enters the PhD program having earned an MS in a related discipline.

(b) A minimum total of ninety (90) graduate credits are required if a student enters the PhD program having earned an MS in a related discipline.

A formal “Plan of Study” with a minimum of 30 credit hours of graduate coursework, a minimum of 15 credit hours of research, and a minimum total of (a) 60 credit hours or (b) 90 credit hours must be approved by the student’s advisory committee and submitted to the OSU Graduate College before the student’s advisory committee is selected at the end of the student’s second semester. All graduate students must maintain a B average in their graduate coursework. The minimum total of sixty (60) graduate credits is required if a student enters the PhD program having earned an MS in a related discipline.

A minimum of 30 credit hours is required for graduation. A minimum of 24 hours must be 5000 level or above. Required courses include 6 credit hours from the core courses in biochemistry, statistics and computer sciences. Additional information on this Certificate Program is available online: http://www.bioinformatics.okstate.edu/.

Bioinformatics Graduate Certificate Program

The Department of Biochemistry and Molecular Biology also offers the Bioinformatics Graduate Certificate Program - a multi-disciplinary program that integrates coursework across the University. This program's mission is to train post-baccalaureate students in the techniques required to generate, analyze, and interpret complex biologically-derived data sets. The Graduate Certificate in Bioinformatics requires completion of 18 credit hours of course work eligible for graduate credit. A minimum of 12 credit hours must be at the 5000 level or above. Required courses include 9 credit hours from the core courses in bioinformatics, life sciences, and computer sciences. Additional information on this Certificate Program is available online: http://www.bioinformatics.okstate.edu/.

Review Process for Admission

The Department's Graduate Studies Committee reviews all eligible applications for the graduate program in Biochemistry and Molecular Biology. To be eligible for committee review, each applicant must submit an application for admission to the Graduate College, along with transcripts of all academic records, GRE scores and TOEFL scores if their undergraduate education was in a language other than English. Applicants must submit to the Department three reference letters, a current resume, and a statement of purpose.
Chemistry
Nicholas Materer, Ph.D.—Professor and Chair
Chemistry is the science that deals with the composition, structure, and interactions of matter. 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 medicines, are all studied and modified through chemical means. From natural chemicals, chemists create new and useful substances that enhance the quality of life. Chemists develop new drugs to fight disease, new agents to combat pests that destroy crops, and new materials for structures or electronics. Chemists are at the forefront in advancing new technologies to solve problems involving human and animal health, the environment, energy alternatives and conservation, new materials, detection of hazardous substances and crime scene investigations.
A student considering a career in chemistry should have a strong curiosity about natural phenomena, good problem solving skills and an above average work ethic. To succeed in this major, it is important to learn more about the changes that take place in materials and to use this knowledge for the betterment of humankind. Interest and ability in mathematics and physics are also helpful since these subjects are basic to the study of chemistry.
Chemists are employed in industry, government, and education. In industry, jobs range from highly focused problem solving and product development to quality control, environmental testing and even sales. A great deal of industrial research is devoted to food and drug production as well as new energy sources, materials and detection devices. State and federal agencies also employ chemists for basic research and analysis. Finally, many chemists become teachers in high schools, colleges, and universities. In addition to teaching classes, many college and university faculty members train students to do research in their laboratories. Generally, an MS or PhD degree is required for those interested in research or college level teaching.
The Department of Chemistry offers three bachelor’s degrees: (1) a BS degree that is certified by the American Chemical Society; (2) a departmental BS degree that requires less specialization; (3) a B.S. degree with specialization in secondary education.
Our chemical laboratories are modern and well-equipped with instruments for the determination of chemical properties, the study of chemical reactions and the detection and structure elucidation of small quantities of materials. Undergraduate research is encouraged as part of the chemistry curriculum.
Graduate Programs
Prerequisites. Students entering this program 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.
Admission Requirements. For admission, a grade-point average of 3.00 or better is generally required. Deserving applicants with grade-point averages less than 3.00 are occasionally 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 required. Recommendations on admission to the Graduate College are made on behalf of the applicant by the departmental admission officer. Acceptance by a permanent advisor is not a prerequisite for admission to the program.
Degree Requirements. A more detailed description of the graduate study program in chemistry is available in a brochure supplied by the department upon request, or on the Internet at http://chemistry.okstate.edu. The requirements set forth below complement the general requirements stated in the "Graduate College" section of the University Catalog. Attendance and participation in the departmental colloquia 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 a focus in analytical, biological, environmental, inorganic, materials, medicinal, nanotechnology, organic physical, polymer or theoretical chemistry or chemical education. The student must pass a qualifying examination in his or her field of specialization.
An acceptable dissertation must be presented which contains a substantial original contribution to the field of chemistry. The student must pass a final oral examination covering the dissertation 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 the student and his/her advisory committee consistent with departmental requirements.
Communication Sciences and Disorders
Maureen A. Sullivan, PhD—Associate Professor and Interim Head
The Department of Communication Sciences and Disorders offers Bachelor of Science and Master of Science degrees in Speech-Language Pathology. The undergraduate program focuses on the scientific study of normal and disordered communication processes. Emphasis is placed on developing background knowledge in phonetics, speech and language development, anatomy and physiology, speech science, and the neurogenic basis of communication. During the junior year, students are introduced to a variety of communication disorders in preparation for the Master of Science degree. All students participate in 25 hours of applied clinical observation.
Graduate Programs
The Master of Science degree program is designed to provide students with intensive course work in the various communication disorders and with a wide variety of clinical rotations both on and off campus. Research opportunities are available under the direction of the graduate faculty. Graduates are prepared to take positions in hospitals, community speech and hearing centers, private practices, schools and other related settings, and to pursue additional graduate education at the doctoral level. All graduates meet the academic and clinical requirements for the Certificate of Clinical Competence in Speech-Language Pathology from the American Speech-Language-Hearing Association, and the Oklahoma license in Speech-Language Pathology.
Additionally, many students elect to earn the state teaching certificate required to practice speech-language pathology in the Oklahoma school system. The program holds national accreditation from the Council on Academic Accreditation of the American Speech-Language-Hearing Association.
Prerequisites. Admission to the graduate program requires a bachelor’s degree in Communication Sciences and Disorders, or an out-of-field bachelor’s degree plus at least 20 hours of prerequisite course work.
Admission Requirements. Applicants for admission should have a minimum grade-point average of 3.40 in the major, strong letters of recommendation from those familiar with the student’s previous academic background, a minimum combined verbal and quantitative GRE score of 298 (including an equivalent of 1000), a minimum verbal GRE score of 153 (or a total GRE score of 500), and a minimum analytical writing score of 3.5. Students not meeting the above requirements may be admitted on a provisional basis. Admission is competitive, and all application materials must be received by February 1st of each calendar year for fall admission. Completed applications must include: an online application, GRE scores, three letters of recommendation, transcripts from all undergraduate institutions, and a personal statement indicating why the applicant desires to be a speech-language pathologist. In addition, all applicants must have completed a course in an introductory speech, an audiology course, and a neural anatomy and physiology course having earned a grade of “B” or better. Additional national certification requirements must be completed before enrollment in graduate coursework. Those requirements include the following: physics, biology, psychology, and statistics.
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 79 (internet-based) or 550 (paper-based) on the Test of English as a Foreign Language (TOEFL) and a minimum of 26 (internet-based) or 600 (paper-based) on the speaking portion of the TOEFL (IBT) or a minimum IELTS speaking score of 8.5 to be cleared for clinical assignments. It is especially important that students have readily intelligible spoken English—because they are conducting therapy sessions in English. Additional requirements for international students:
Requirements: Students who score a minimum of 42 on the combined Reading and Listening portions of the TOEFL (internet based) with a minimum score of 20 in each section are not required to enroll in remedial coursework. Remedial coursework includes enrollment in ENGL 003 during the first semester. The course carries a grade of S/U and may not be used toward minimum degree requirements. Students must enroll in ENGL 003 each semester until a grade of S is earned. Students who score less than 22 on the TOEFL Writing portion must enroll in ENGL 4893 during their first semester. ENGL 4893 carries graduate credit and may be used toward minimum degree requirements. A minimum grade of C is required. Both ENGL 003 and ENGL 4893, as applicable, must be listed on the student’s Plan of Study.
Alternatively, an official IELTS, academic stream, examination with a minimum overall band score of 6.5 will satisfy the English proficiency requirements for admission to a graduate program. Either examination must have been taken within the last two years. Students who have completed the IELTS-or the paper-based TOEFL have different requirements as stated by the OSU Graduate College. To ensure that graduate students are prepared to successfully complete a written English, the Test of English Language Proficiency (TELP) is required for all graduate students who took the IELTS or paper-based (PBT) TOEFL test. The TELP must be taken before the student’s first semester enrollment.
Financial Aid. All admitted students will be considered for graduate teaching assistanships and fee waiver scholarships. Graduate teaching assistants qualify for tuition waiver.
Program Requirements. Requirements for the master of science degree include 36 credit hours of academic courses and 15 credit hours of clinical practice. The program typically can be completed in two academic years including one summer semester.
Examinations. Students enrolled in a thesis option complete a master’s thesis under the direction of a member of the graduate faculty. Students enrolled in a non-thesis option complete an academic/clinical portfolio, and a comprehensive examination.
Computer Science
K.M. George, Ph.D.—Professor and Head

Computer science is concerned with theoretical and practical methods of storing, processing and communicating information by means of computing devices and computer networks. Professional computer scientists obtain a formal education through the BS, MS or PhD 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 marginal 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 offers the full range of degree programs—BS, MS and PhD. All programs are offered in Stillwater. The BS is offered on the Tulsa campus. Students admitted to the BS degree on a probationary basis. The student must have minimum overall GPA of 2.0; take CS 1113, CS 2133, MATH 2144 and MATH 2153 with no course grade less than “C” and have a GPA for the four courses of 2.5 to remain in the program. CS majors whose semester GPA is below 2.0 or 2.5 for their major core courses will be placed on departmental academic probation, regardless of overall GPA. Students on CS departmental probation must complete a minimum of 9 hours at Oklahoma State University with a GPA of 2.5 or higher to have their probationary status removed. Students who are not able to have their CS probationary status removed following the completion of a minimum of 9 hours of (nine semester’s work, if more than 9 hours) will not be allowed to enroll again as an undergraduate major in CS regardless of their overall GPA.

A student who experiences a catastrophic event that plays a significant role in his or her being placed on CS academic probation has the right to appeal to the Head of the Computer Science Department. With a successful appeal, a student will be given a semester to raise his or her GPA to the minimum level both overall and/or in his or her core courses before any probationary action is taken.

Most BS and MS graduates obtain positions in industry. Approximately half of the PhD graduates take university teaching and research positions and half are employed in industry.

The Computer Science Department has a variety of computing resources, including a Linux cluster, several Linux workstations, an iMac mobile app lab, and robotics and graphics, gaming and media labs. The systems are available to Computer Science students, faculty and staff for both course assignments and research work. Graduate students have access to several research labs. The department also has a student lounge for networking.

Computers can be accessed through the OSU Information Technology Division. There are a number of personal computer labs located in various buildings on campus. Some of the residence halls have personal computer labs available. All of the labs have links to personal academic probation, regardless of overall GPA. The Computer Science Department has a variety of computing resources, including a Linux cluster, several Linux workstations, an iMac mobile app lab, and robotics and graphics, gaming and media labs. The systems are available to Computer Science students, faculty and staff for both course assignments and research work. Graduate students have access to several research labs. The department also has a student lounge for networking.

Graduate Programs
The department offers degree programs leading to the Master of Science degree and to the Doctor of Philosophy degree. These programs are designed to prepare students 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 course work, a student must complete a dissertation for a PhD degree. The MS degree program provides a thesis option and a non-thesis option. A student must complete a thesis for MS degree in the thesis option or a report for MS degree in the non-thesis option.

The core course requirement assures the student of breadth of knowledge in computer science; the freedom to choose an area and additional research areas as the student acquires sufficient 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 in the thesis option, 30 hours of graduate credit, including a six-credit-hour thesis, are required. For a master’s degree in the non-thesis option, 36 hours of graduate credit, including a two-credit-hour report, are required.

A master’s degree student is required to pass an oral examination over the thesis or the report. If the oral examination is over a report, the committee members may ask questions over material covered in both core courses and in all courses listed on the Plan of Study and in all prerequisites for these courses.

For the PhD, 60 credit hours beyond a master’s degree (or 90 hours beyond a bachelor’s degree) are required. A dissertation of 15 to 40 hours (counting towards the maximum) is required. The PhD dissertation must describe original research. PhD students must pass (at an appropriate level) a diagnostic examination, a comprehensive examination, a qualifying examination, and a final oral examination. In general, both academic and industrial positions exist for each PhD graduate.

The candidate’s baccalaureate degree need not be in computer science in order to enter the MS program. Students with degrees in other areas may be admitted provisionally and required to take specified prerequisite courses.

Economics and Legal Studies in Business
Lee Adkins, Ph.D.—Professor and Head
See “Economics and Legal Studies in Business” in the “School of Business” section for additional information.

Economics is a science of human choice. The study of economics centers on what motivates us to act, and, more importantly, the consequences to ourselves and to others of our actions. It provides a comprehensive view of how a society is organized to transform its limited resources into want-satisfying goods and services. It investigates the principles underlying the operation of the economic system, seeks to determine its weaknesses and to prescribe policies that will improve its operation. In the process, economic principles are used to address 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 is the development of elementary mathematical and statistical skills and complementary study in the social and behavioral sciences.

A major in economics prepares students for positions with business firms, non-profit private organizations and government agencies—both national and international. It provides an excellent background for the study of law. An international economic relations option is also offered. A degree option in business economics and quantitative studies is offered through the Spears School of Business to provide additional training in analytical methods and communication skills for both public and private sector occupations. A student interested in pursuing graduate studies in Economics should include a wide range of math courses in their undergraduate curriculum.

Graduate Programs
The department offers programs 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 regional and urban economics, international economics, and economic development. In addition, graduate courses are offered in energy, economics, and econometrics.

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. Students must have an undergraduate economics degree, be well grounded in economic theory, and have an excellent mathematical background. A total of 30-33 graduate credits are required to earn an MS in economics.

Each graduate student is guided in the preparation of a plan of study by the graduate program director. At the master’s level there are two options: one provides the student with a well-rounded program that prepares the student for the doctoral program in economics or further graduate study in another related discipline. The second option is applied economics which stresses communication skills, quantitative analysis and course work from other disciplines related to a career objective.

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.

A research report or thesis is required of all students who take only the MS degree. 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 superior academic records. A total of 60 graduate credits are required to earn a PhD with a previous earned MS degree. A total of 90 graduate credits are required to earn a PhD without a previously earned MS.

This program stresses balanced preparation in economic theory and mathematics, as well as competence in subject-area fields of specialization. The student is required to pass qualifying examinations in the theory core and in one field of specialization. (The theory core is not considered a field of specialization.) Competence must be demonstrated in a second field of specialization, through course work. The graduate program director helps the student develop a plan 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 PhD degree in economics. The final oral examination is the dissertation defense.
English
Richard Frohock, PhD—Professor and Head

The Department of English prides itself on the diversity of its course offerings and on its small lecture and discussion classes. The department offers a full range of courses in seven areas: literature, creative writing, screen studies, linguistics, teaching English as a second language, rhetoric, and professional writing. The number of students in any English class rarely exceeds 30; and in a writing class, including freshman-level classes, the enrollment limits range from 15 to 19. The maximum number of students in a graduate-level class is 12.

An undergraduate English major may select from four options: The traditional literature-based option emphasizes literary appreciation and analysis; and allows ample opportunity for discussion, independent thinking and writing. English majors can also add a teaching certificate to this option by completing the required education courses as electives. The creative writing option includes fiction writing, poetry writing, and creative nonfiction, with an emphasis on interaction with the student's advisory committee. The screen studies option emphasizes film, screen studies, focuses on the study of the history, theory, and aesthetics of cinema, television, and new media. And the fourth option, professional writing, is for majors who seek careers using writing to generate and exchange ideas in professional settings.

Many English majors pursue careers directly related to their major, such as those in teaching, editing, or publishing, or they may decide to go to graduate school in order to teach in a college or university. Other students find that an English major is excellent preparation for law school or for careers in the ministry, government, business, counseling, social work, or library science. The Department of English actively participates in the University Honors Program. Students who qualify for Honors are eligible to enroll in restricted courses and to write a Senior Honors Thesis. The department offers Honors courses at all levels, including an Honors seminar on a different topic each year.

A Bachelor of Arts in English requires 45 hours of lower- and upper-division English courses. An English minor requires 18 hours of English, at least nine of which must be upper-division. (These hours do not include Freshman Composition.)

Graduate Programs

The Department of English offers programs leading to the Master of Arts, Master of Fine Arts, and the Doctor of Philosophy. Master's students may choose among four programs: Master of Arts in English; Master of Arts in professional writing; and Master of Arts in teaching English as a second language (TESL); and the Master of Fine Arts in Creative Writing. In consultation with their advisory committees, both master's and doctoral students have considerable flexibility in designing a degree that meets their own interests and professional goals. Students may take courses in creative writing, screen studies, professional writing, composition and rhetoric, TESL, linguistics, literary theory, and all periods of British and American literature. The diversity of choices and the flexibility of the program prepare students to meet the demands of a changing academic marketplace.

Admission Requirements. Students seeking admission to the graduate program in English must be accepted by the Graduate College and by the departmental admission committee. In addition to the application and transcripts required by the Graduate College, students must submit to the Department of English a statement of purpose; letters of recommendation; and a writing sample or the Graduate Record Examination general and subject area scores. Non-native speakers of English must submit scores on all subtests of the TOEFL iBT. For fall admission, the preliminary decision is made by January 15; the final deadline is March 1. The deadline for spring admission is October 15. Prerequisites are listed under each degree below.

Teaching Opportunities. Depending on their levels of experience and areas of emphasis, graduate teaching assistants may tutor in the Writing Center, serve as discussion leaders for selected large lecture classes, or teach their own sections of freshman composition, composition for international students, technical writing, creative writing, screen studies, or literature. All teaching assistants are required to take an appropriate pedagogy course during their first year of teaching.

The Master of Arts Degree. The MA in English allows students to develop expertise in a variety of areas: literature written in English, creative writing, literary theory and criticism, screen studies, composition and rhetoric, professional writing, linguistics, and TESL. In consultation with their advisory committees, students devise an individualized curriculum that reflects their own intellectual interests and prepares them to enter a doctoral program or to teach at the college level. The degree programs in TESL and professional writing prepare teachers for the bilingual classroom and professional writers for industry.

Prerequisites include a baccalaureate degree with an English major, or at least 24 hours in English (excluding freshman composition). Successful applicants usually have a minimum grade-point average of 3.00 on a 4.00 scale, particularly in English courses.

The MA in English consists of 30 credit hours, including six hours of thesis. In addition to these hours, students must demonstrate reading knowledge of a foreign language, pass the MA qualifying examination, and pass an oral defense of the thesis. The thesis is a work of original research prepared with the guidance of the student's advisory committee. Creative writing students may present as their theses original works in poetry or prose fiction. The programs in professional writing and TESL have separate degree requirements described below.

Professional Writing. The MA option in professional writing consists of 30 credit hours (with thesis) or 33 credit hours (without thesis). In addition to these hours, students must fulfill the foreign language requirement and pass the MA qualifying examination in technical writing. Prerequisites are the same as those above.

TESL. The MA option in teaching English as a second language is designed to provide students with the skills necessary to teach English to non-native speakers in a variety of settings, such as teaching English as a foreign language in overseas schools, college classes in teaching English as a second language to international students studying in intensive English programs in the U.S.; or teaching English to bilingual and bicultural students in American public school systems and adult education programs.

Prerequisites are the same as those above except that the major may even be in English or in a field related to second language acquisition or teaching. In addition, applicants to the TESL program must have six hours in a foreign language with a grade of "B" or better, or must complete this requirement prior to taking the qualifying examination.

The TESL program consists of 30 credit hours (thesis option) or 34 credit hours (non-thesis option). In addition to these hours, students must pass the MA qualifying examinations in TESL.

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. The Oklahoma State Board of Education recently approved an "optional certification" for teachers of English as a Second Language. Already certified teachers can obtain this certification upon passing the required standardized examination. Several of the courses offered for the TESL option can prepare students for this examination, although the MA degree does not confer certification.

Certificate in TESOL (Teaching English to Speakers of Other Languages). The Certificate in TESOL is a program designed to provide students with the skills important for teaching English to non-native speakers in a variety of situations, including teaching English to bilingual/bicultural, English Language Learner (ELL) and Limited English Proficient (LEP) students in public school systems and adult education programs, teaching English as a Second Language to international students studying in English programs in the U.S., and teaching English as a Foreign Language in an overseas school, college, or university. The certificate consists of 12 credit hours, with three required courses and one elective course chosen from a group of courses offered by the Department of English.

Admission to the Certificate Program in TESOL requires a Bachelor of Arts or Bachelor of Science degree from an accredited institution of higher learning, a 3.0 GPA, two letters of recommendation, and, for non-native English speakers, appropriate scores on either the TOEFL iBT or IELTS.

The Master of Fine Arts Degree. The MFA in Creative Writing allows students to focus on developing their abilities as poets and/or fiction writers, through a course of study emphasizing creative writing workshops, literature seminars, and electives in either of those areas or other areas in language and culture. In consultation with their advisory committees, students devise an individualized curriculum that reflects their own artistic and intellectual interests and prepares them to publish their artistic writing, enter a PhD program, or teach at the college level.

The MFA in Creative Writing consists of 42 credit hours, including 12 hours of thesis. In addition to these hours, students must present their creative work at a public reading following the completion of their thesis.

Prerequisites include a baccalaureate degree with an English major, or at least 12 hours in English (excluding freshman composition) and writing sample of high quality. Successful applicants usually have a minimum grade-point average of 3.00 on a 4.00 scale, particularly in English courses.

The Doctor of Philosophy Degree. The Department of English grants one doctoral degree, the PhD in English. Students may, however, emphasize in their courses, their exams, and their dissertations a variety of areas: all periods of British and American literature, Native American literature and language, creative writing, literary theory and criticism, screen studies, rhetoric and professional writing, linguistics, and TESL. They may also choose an interdisciplinary emphasis. In consultation with their advisory committees, students devise an individualized curriculum that reflects their own intellectual interests and professional goals.

Prerequisites include a master's degree in English or a field related to the student's area of emphasis. Successful applicants usually have a minimum grade-point average of 3.00 on a 4.00 scale in their master's degrees. All PhD students are admitted provisionally and must take the first-year examination during their second semester of enrollment.

The PhD degree consists of 60 credit hours beyond the master's degree. Fifteen to 20 of these hours are devoted to the dissertation. In addition to these hours, students must take a first-year examination; demonstrate reading knowledge of two foreign languages or mastery of one language; pass the PhD qualifying examination in two areas; and pass an oral defense of the dissertation.

The dissertation is a work of original research prepared under the direction of
the dissertation committee. Creative Writing students may present as their dissertations original works in poetry or prose fiction.

Additional information and requirements may be found in the English Graduate Guidelines, which may be consulted online at english.okstate.edu.

Foreign Languages and Literatures

Karina Schestokat, PhD—Professor and Head

The Department of Foreign Languages and Literatures offers French, German, and Spanish as majors of study. Majors may be earned in American Sign Language, Chinese, French, German, ancient Greek, Japanese, Latin, Russian, and Spanish, or an Area Studies program.

In all languages offered by the department, elementary courses are available for students with no previous experience. Students with previous foreign language experience are strongly encouraged to take placement tests to find the course best suited for their level of proficiency. A major in a foreign language is often supported by study of another language or work in other fields.

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 liberal arts degree.

Job opportunities are greatly enhanced for those who combine foreign language study with a major in another discipline. In addition to 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.

In addition to the standard courses in language, literature and civilization for individual languages, the department offers literature-in-translation courses for general education, and courses in German for reading knowledge and Russian for reading knowledge.

Geography

Dale K. Lightfoot, PhD—Professor and Head

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

Geographers attempt to understand human behavior by answering such questions as: Where do people work? Where do they play? Where do they live? Why do people make these locational choices? What are the consequences of these decisions and behavior?

Because the physical environment is important in many explanations of spatial behavior and spatial patterns, geographers have traditionally concerned themselves with the relationships between humans and their environment. What impact do people have on the land? What impact does the land have on people? How do people perceive their environment? How does this perception influence their activities?

Finally, geographers examine spatial patterns and behaviors in specific regional contexts. These analyses occur at many levels—worldwide, 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, remote sensing, Geographic Information Systems, area studies, management or education are among those who 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 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 inquiry and 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 manages the Center for Applications of Remote Sensing, a palynology/paleoecology laboratory, a computer mapping facility, spatial database facility, field mapping equipment such as Global Positioning System receivers, an interactive weather analysis system with satellite data feed, and two ARC GIS equipped geographic information system laboratories. Two international journals are edited and published by faculty members in the department, the Journal of Cultural Geography, and the Journal of Central Asian Studies.

The department specializes in three areas: Cultural, Urban and Historical geography, Resource Management, and Geographic Information Systems and Technology. Complementary course work supporting these specialized areas is available in other departments.

The Department of Geography offers the BA and BS degrees with the ability to specialize in one of four degree tracks. These tracks are Outdoor Recreation and Resource Management; People, Place, Society; Global Studies; and Environmental Change and Sustainability. An advanced program leading to the MS and PhD degrees is also available. The department also sponsors students in the interdisciplinary MS and PhD programs in environmental science.

Certificate in Geographic Information Systems (GIS). The certificate in GIS provides students with broad exposure to principles and applications of GIS. A student who has earned the certificate is well-versed in general GIS theory and has knowledge and/or practical experience to the following: (1) hardware and software used in GIS, (2) planning and construction of spatial and non-spatial databases, (3) GIS analyses (performed on data related to the student's area of interest), and (4) representation of data in both mapped and tabular form.

Requirements for the certificate are designed to parallel skills needed by GIS professionals. Through elective courses, students focus on one of several areas of specialization. Admission into the certificate program is open to anyone enrolled as an undergraduate student, graduate student or special student at OSU. To receive a certificate in GIS, a student must complete 21 hours of course work in GIS that is part of either a degree program or is 21 hours of coursework. Students must pay attention to the certificate while completing their bachelor's or graduate degree.

Geospatial Information Science. Driven by technological innovations and an explosion in the availability of spatial information, geospatial technologies including geographic information systems (GIS), the Global Positioning System (GPS) and remote sensing have introduced revolutionary ways to utilize spatial data. A student who earns the BS in Geospatial Information Science at OSU will be well-versed in general GIS theory and will have competency utilizing GIS hardware and software for the planning, development and maintenance of spatial and nonspatial databases. Most important, students who complete the BS will have higher order skills involving the analysis of geospatial data and will be capable of communicating findings with large audiences. Requirements for the proposed BS have been designed to parallel skills needed by GIS professionals. Upon earning the BS, a student will be proficient in spatial data capture, data representation, spatial data analysis, GIS and database theory, and GIS project development and implementation. Students can expect to find occupations in a variety of fields in private industry, government, education, and agriculture.

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Since the early 1990s, the OSU Geography Department has distinguished itself as a leader in GISc instruction and research. In 1996 the Department launched the state's first Certificate in Geographic Information Systems and in subsequent years has expanded GISc course offerings to address growing student interest and demand. The Department is well-known nationally and internationally for research involving the integration of GISc within farm-level decision-making, for scholarship involving human patterns and processes tied to cultural and historical landscapes and for research involving communications and transportation systems. Faculty in the Department have been highly successful in obtaining extramural support for GISc research and extension activities from organizations ranging from the National Science Foundation to the National Park Service, U.S. Department of State, Oklahoma Historical Society, and the U.S. Department of Transportation.

In the Department's MS work in GIS and related topics and hold a bachelor's or more advanced degree

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Graduate Programs

The Department of Geography offers work leading to the MS and PhD degrees. These degree programs emphasize preparation for employment in positions which are enhanced by an ability to recognize and to interpret spatial distributions, 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 graduate degrees in geography have also gone on to a variety of successful careers in various fields, including retail spatial analysis, city planning, environmental assessment, and university teaching and research.

Incoming graduate students must demonstrate competency in cultural geography, physical geography, statistics, and cartography. If a student lacks
The PhD is awarded upon completion of a dissertation. A minimum of 60 credit-hours (course work and research hours) beyond the master's degree is required for the PhD. Under normal circumstances, students must hold a master's degree in geology or a related field to be accepted into the PhD program. However, under exceptional circumstances, students may be accepted directly into the PhD program without a master's degree. Such students will be required to complete a total of 90 semester credit-hours (course work and research hours) to earn their degree. Scholarships are made by the entire faculty of the School of Geology, upon recommendation of the Graduate Advisor. To be admitted to candidacy, students must pass a written and oral qualifying exam, and successfully defend their dissertation research proposal and pass an associated comprehensive exam. The PhD is conferred after the successful defense of the dissertation.

Boone Pickens School of Geology
Estella Atewa, PhD—Regents Professor, Sun Chair of Hydrogeology and Head

Earth is the residence of the human race, therefore it is essential to develop a better understanding of the composition, internal and external forces that affect the Earth. Earth is an outdoor laboratory filled with opportunities to observe geologic processes in action. By applying knowledge of forces that shape Earth, geoscientists seek to reconstruct the past and anticipate the future. Geoscientists provide information to society for solving problems and establishing policy for resource management, environmental protection, and public health, safety and welfare.

Geology is concerned with the processes, the history, and the characteristics of the rocks and sediments that shape the Earth. Human activities, predominantly on or near the surface, have utilized rocks and rock products, 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, volcanic events, 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), geochronology (study of Earth processes), structural geology, and paleontology (study of fossils), have developed.

The Boone Pickens School of Geology offers traditional academic program services, awards BS, MS and PhD degrees in geology and conducts various outreach programs. Geology majors are provided a quality education designed to develop leadership skills and enhance employment opportunities. The faculty of the Boone Pickens School of Geology conduct research in the areas of continental tectonics, conventional and unconventional energy resources, environmental issues, paleoclimatology, geophysics/remote sensing. In these areas, the school has already established a sound infrastructure—appropriate faculty appointments, laboratory and computer upgrades, and a sound record of productivity. Geology undergraduates are eligible for one of at least 10 available departmental scholarships, based on academic achievement and need. Teaching assistants, research assistants, and fellowships are available for qualifying geology graduate students.

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 groundwater. The geologist is well-prepared to advise and direct governmental studies. Careers in research may be found with private employers, government 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

The Master of Science Degree.

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

The Doctor of Philosophy Degree.

The PhD is awarded upon completion of a doctoral dissertation. A minimum of 60 credit-hours (course work and research hours) beyond the MS or MA degree are required for the PhD. Under normal circumstances, students must hold a master's degree in geology or a related field to be accepted into the PhD program. However, under exceptional circumstances, students may be accepted directly into the PhD program without a master's degree. Such students will be required to complete a total of 90 semester credit-hours (course work and research hours) to earn their degree. Scholarships are made by the entire faculty of the School of Geology, upon recommendation of the Graduate Advisor. To be admitted to candidacy, students must pass a written and oral qualifying exam, and successfully defend their dissertation research proposal and pass an associated comprehensive exam. The PhD is conferred after the successful defense of the dissertation.

Gender and Women's Studies

Lucy Bailey, PhD—Professor and Director

Gender and Women's Studies is an interdisciplinary program offering a minor for undergraduates, support for curricular development and research by faculty, and opportunities to collaborate with community and campus partners who are inspired by how gender shapes the world. Faculty and courses from twelve departments across the university contribute to the program. The minor is offered through the College of Arts and Sciences, but is open to all undergraduates regardless of major. In addition to two required courses in Gender and Women's Studies (GWST 2113 or 2123; 4113), students choose from courses focusing on gender and women (9 hours), and from classes that complement gender and women's studies (6 hours).

Students in Gender and Women's Studies pursue research in the history of women, in theories of gender, in feminism, in the cultural construction of masculinity, and in the cross-cultural intersections of race, class, nationality, and gender. Work in Gender and Women's Studies connects with a wide variety of careers, including nonprofit development, graduate training in humanities and the social sciences, education, curatorial administration, human resources, creative writing and reportage, international relations, publishing, public relations, electoral politics, and advocacy.

History

Laura A. Belmonte PhD—Professor and Head

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 insight into the meaning of this evolution. They are also designed to prepare graduates for many types of employment.

Because history is basic to many fields, the Department's instruction is designed to aid students interested in the humanities, 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 a minor in History are encouraged to enroll in History courses. The Department of History offers a number of courses that satisfy General Education requirements in the humanities, social sciences, and diversity. It participates actively in the Honors Program and offers to its majors the option of pursuing an Honors certificate. The Department of History also participates actively in interdisciplinary programs.

A Bachelor of Arts (BA) in History requires 48 hours in the major and related disciplines, with 36 hours of History courses across U.S., European, and World History, plus 12 hours of upper-division courses is required. A History minor requires 18 hours of History, at least twelve of which must be upper-division. GPA of 2.5 in History courses with no HIST grade below "C."
The Master of Arts Degree. Admission to the MA program requires submission of scores for the verbal, quantitative, and analytical writing sections of the Graduate Record Examination. Candidates for the MA degree choose one of two alternative plans. Requirements common to both plans include completion of a course (HIST 5023) in historical methods of research and writing, research and reading 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 second semester of enrollment. The two 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 two fields. These hours must include at least 12 hours of seminar (including at least one research seminar), Historical Methods (HIST 5023), and six hours of thesis (HIST 5000). Students must take at least 12 hours in the major field and at least 9 in a minor field. With the consent of their advisory committee, students may take course(s) at the graduate level in a related discipline.

Fields of study include:
- United States
- Europe
- Ancient World
- Middle East
- Asia
- Latin America

Students must demonstrate satisfactory reading knowledge of one foreign language.

Plan II. (Students must be pursuing Public History.) Students must complete a minimum of 36 hours of graduate courses. These hours must include at least 9 hours of seminar (reading and/or research). Historical Methods (HIST 5023), Introduction to Public History (HIST 5033), an internship (HIST 5030), and 6 hours of thesis (HIST 5000). Normally, students will also take Museum Studies (HIST 5053) and/or Historic Preservation (HIST 5063). With the approval of the student’s advisory committee, as many as 9 of these hours may be taken in related disciplines. The foreign language requirement required of Plan I students is optional, but a student’s advisory committee may require foreign language proficiency for certain topics.

The Doctor of Philosophy Degree. Admission to the PhD program requires a satisfactory score on the Graduate Record Examination. Applicants must also meet Oklahoma State University requirements for the MA degree in history, with preference for applicants having at least a 3.50 grade point average (on a 4.00 scale).

The PhD program requires at least 60 hours beyond the MA degree. Students must select 3 fields of study—a general field (at least 15 hours), a major field (at least 12 hours), and a minor field (at least 9 hours) from the options shown below. The minor fields must not duplicate the general field. To be admitted to candidacy, students must pass comprehensive examinations, demonstrate a reading knowledge of one foreign language, have an approved dissertation proposal, and submit a Plan of Study to the Graduate College before writing a dissertation.

All PhD students must take Historiography (HIST 6023) and Teaching History at the College Level (HIST 5021), and at least 18 hours of seminar, including at least 3 hours of research seminar. Students without a MA thesis must take Historical Methods (HIST 5023). With the consent of their advisory committee, students may apply graduate course work taken outside the History Department to their major field.

General fields:
- United States
- Europe to 1789
- Europe after 1789

Major fields (including but not limited to):
- United States West
- Native North America
- Thematic fields (may be transnational)
- Science, medicine, and technology
- Religion
- Gender
- War and society
- Race and ethnicity

Minor fields:
- Europe
- Ancient World
- Middle East
- Asia
- Latin America
- Public History

Thematic fields (may be transnational)
- Science, medicine, and technology
- Religion
- Gender
- War and society
- Race and ethnicity

Upon the recommendation of the departmental Director of Graduate Studies, a PhD advisory committee of no fewer than four voting members will be appointed by the Dean of the Graduate College. This committee consists of members of the OSU Graduate Faculty (at least one from each of the examination fields and one from outside the History Department), including the student’s major advisor, who acts as a chairperson and must have PhD chairing privileges.

Integrative Biology

Loren Smith, PhD—Regents Professor and Head

The Department of Integrative Biology offers BS degree programs in biological science, physiology, and zoology. The undergraduate degree in biological science is appropriate for students wanting to obtain a broad background in the life sciences. Students complete general education requirements in animal, plant and microbial biology, genetics, ecology, physiology and evolution. This degree meets the requirements for admission to graduate and professional schools, and also prepares students for a broad range of biology-related employment opportunities. Students who choose this degree can also select options in environmental biology, pre-healthcare, or secondary teacher certification.

The undergraduate degree in physiology also serves as preparation for graduate school or a medically-related professional school. The bachelor’s degree in physiology requires participation in an undergraduate seminar and intensive coursework in general biology, genetics, comparative anatomy, mammalian physiology, biochemistry, mathematics, physics, and chemistry. Students may also choose to pursue an option in pre-medical sciences.

The curriculum in zoology is designed to provide a thorough background in the biology of animals and prepares students for graduate school and many applications. The professional careers. The zoology degree requires courses in ecology, evolution, genetics, and vertebrate and invertebrate zoology. Students participate in unique research experiences and/or internships and develop a good foundation in the related fields of chemistry, physics, and mathematics. Options with the zoology degree include ecology and conservation biology, pre-medical sciences, and pre-veterinary science.

Graduate Programs

Programs of Study. Programs of study leading to MS and PhD degrees are offered in integrative biology. The department emphasizes Ecology and Evolutionary Biology and Environmental Stress. Among faculty research interests are behavioral and evolutionary ecology, conservation biology, cytogenetics, ecotoxicology, ecosystem services, ecological immunology, behavioral endocrinology and neuroendocrinology, theoretical ecology, invertebrate ecology, ichthyology, herpetology, ornithology, mammalogy, parasitology, landscape ecology, molecular systematics, population ecology, aquatic and wetland ecology, and science education. The department includes the Ecotoxicology and Water Quality Research Laboratory and the Oklahoma State University Collection of Vertebrates.

Prerequisites. Applicants must have completed a baccalaureate degree including 40 semester hours in biology and related areas and have completed the Graduate Record Examination.

The Master of Science Degree. Students must prepare a research proposal 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 Doctor of Philosophy Degree. Students must prepare a research proposal, pass written and oral comprehensive examinations, and complete a dissertation based on original research worthy of publication. Most students enter the program already with an MS degree and their plan of study must include at least 60 credit hours. Exceptional students can enter the program directly following the BS; their plan of study must include 90 credit hours.

Financial Aid. The department employs more than 35 graduate teaching assistants (TA). Faculty members also award research assistantships (RA) based on ongoing grants and contracts. Out-of-state students on RA or TA support are assessed in-state tuition only. However, in-state and out-of-state students on RA or TA support also receive full or partial waivers of in-state tuition.

Research Facilities. The Department of Integrative Biology occupies a six-floor building with offices, classrooms, laboratories, and animal rooms. A broad range of instrumentation is available for both teaching and research. The department maintains laboratories in wildlife toxins, herpetological ecology, conservation genetics, geographic information systems and remote sensing, and water quality. Specialized equipment within the department includes atomic absorption spectrophotometers, ultraviolet and visible spectrophotometers, ion chromatographs, high pressure liquid chromatograph, liquid scintillation counter, ultracentrifuges, gas chromatograph, ion specific electrodes, forage fiber analyzer, bright field and epifluorescent microscopes and photomicrography systems, cryostats, laminar flow hoods, tissue culture equipment, PCR thermocyclers, ultracold freezers, horizontal starch, agarose, and polyacrylamide gel apparatus, automated DNA sequencer, and computer labs. Available for use in field studies is the university-owned Lake Carl Blackwell area. The Department of Integrative Biology also houses the OSU Collection of Vertebrates which includes over 25,000 lots of fish, 14,000 reptiles and amphibians, 3,000 birds, and 13,000 mammals.

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The department offers three tracks in the School of Media and Strategic Communications. Undergraduate programs of study in the School of Media and Strategic Communications (SMSC) are designed to complement each other with a minimum of duplication. These areas seek to complement each other with a minimum of duplication. Degrees offered include a bachelor of arts and sciences in Multimedia Journalism, Sports Media and Strategic Communication. 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 and organizations 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 different media, whether as a journalist or a strategic communication practitioner, requires knowledge of the people to whom or on whose behalf one wishes to speak and an understanding of the world in which they live. Therefore, the curricula of the School of Media and Strategic Communications are designed to offer more than training in communication techniques. Three-quarters of the SMSC 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 SMSC. On graduation, undergraduate students in the School of Media and Strategic Communications will be able to:

1. Demonstrate an understanding of the relevant constitutional freedoms, legal issues and ethical principles in mass communications.
2. Demonstrate an understanding of the relevance of human diversity in mass communications.
3. Demonstrate an understanding of the history and social role of mass communications.
4. Demonstrate critical, creative and individual thinking.
5. Demonstrate an understanding of the relevant theories and concepts of mass communications.
6. Demonstrate an understanding of the methods and techniques of research and information gathering.
7. Demonstrate appropriate writing, editing and production techniques in mass communications.
8. Demonstrate an understanding of relevant planning and management methods in mass communications.

Accreditation. The undergraduate programs of study in the School of Media and Strategic Communications are accredited by the Accrediting Council on Education in Journalism and Mass Communication.

Admission to the Undergraduate Program. Admission into the School requires completion of 28 hours with a minimum graduation retention GPA of 2.75. Enrollment in all upper-division SMSC courses except MC 3173 and MC 4253 requires admission into the School, a passing score on the SMSC language proficiency exam, and a minimum grade of "C" in MC 2003 and MC 2023.

Requirements for Graduation. The degree programs of study offered in the School of Media and Strategic Communications are built around strong writing, liberal arts and professional components. Of the 125 hours required to earn a degree in SMSC, students must complete up to 45 semester hours in media and strategic communications courses.

Students must have a minimum 2.5 GPA in all SMSC courses and major requirements with a minimum grade of "C" in each course. No more than 12 hours in SMSC courses may be transferred from other institutions.

All three degree options in SMSC are also required to develop and maintain a portfolio exhibiting their best and most appropriate work as well as assignments required for the portfolio. Portfolios will be turned in during senior capstone courses as part of their graduation requirements. School faculty, staff and industry professionals will evaluate these portfolios periodically and offer guidance and constructive criticism. It is anticipated that the portfolios will be helpful in showcasing students' performance when they apply for internships or jobs.

Multimedia Journalism. The many changes in the media environment require that students should have expertise in journalism and storytelling in all media formats. The degree in multimedia journalism will allow graduates to work with any media platform, be it print, television, radio, or the internet. While students will develop their skills across all media platforms they will be able to specialize in one of two areas: multimedia journalism, news or multimedia production.

Students learn the basics of journalism writing and reporting for print, online, audio and video production on state-of-the-art equipment and are challenged to develop skills across all media platforms, be it print, television, radio, or the internet. While students will develop their skills across all media platforms they will be able to specialize in one of two areas: multimedia journalism, news or multimedia production.

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to put those skills to use by participating in the daily operations of the campus newspaper, The Daily O’Collegian and its online version ocolly.com, the radio stations KOSU and KXXY and various video productions. Students are creating content for OSUtv, the OSU online TV station. Students gain on-the-job multimedia experience through internships and some hold part-time jobs as campus correspondents for various publications or work for media in the Stillwater area.

Internships at broadcast and cable outlets in the region also provide students with on-the-job experience and a valuable opportunity to work with seasoned media professionals. Many juniors and seniors find this work a source of revenue to assist them in the cost of their education.

The multimedia program is affiliated with the Oklahoma Press Association, Southwest Journalism Congress, the Society of Professional Journalists, the National Association of Black Journalists, the National Association of FM Broadcasters, Radio/Television Advertising Bureau, Oklahoma Association of Broadcasters, Oklahoma Broadcast Education Association, National Association of Broadcasters, Broadcast Education Association and National Public Radio.

Sports Media. This program, one of very few undergraduate degrees in sports media in the United States, offers students the option of concentrating in sports multimedia journalism, sports multimedia production, or sports strategic communications.

Students pursuing an undergraduate degree in sports media from OSU receive classic hands-on training in all aspects of the industry. Depending on the area of concentration, course work may include sports writing, play-by-play announcing, field production, broadcasting.

Oklahoma State University and the School of Media and Strategic Communications enjoy a special relationship with sports media throughout the country. As a major sports venue, the OSU campus is visited regularly by national and regional sports media - both print and broadcast - to cover major sporting events. These media organizations routinely utilize SMSC student workers. The 2004 debut of ESPNU was telecast from Stillwater because the campus represents classic collegiate sports, and because the network producers were able to rely on a supply of ready and trained media and strategic communications students.

The sports media faculty has strong professional backgrounds in the field and offers students the solid foundation in both theory and practice that prepare them for a variety of career paths.

Strategic Communication. Employers increasingly require communication professionals to first have an understanding of the relevant audiences with whom they wish to communicate or on whose behalf they need to communicate and then choose the best communication methods, be it through the techniques currently taught in public relations or advertising or both. This requires students to have a thorough understanding of the political, social and economic systems of society. Additionally, the new media environment now requires that professionals have skills they can apply to every media platform, be it print, television, radio, or the internet. Although all students in strategic communication are required to have experience in and an understanding of all strategic communication methods, they do have a choice to specialize in either public relations or advertising.

The degree in strategic communication prepares students to be professional communicators in any environment, such as counseling firms, advertising agencies, corporations, non-profit organizations, or even their own businesses. It still prepares students to write and communicate well because good writing skills remain the foundation of professional communication. It also provides students in a thorough knowledge of gathering and analyzing data relevant to their practice and in communication management principles with an emphasis on strategic thinking. The ultimate aim of this degree is to prepare students to be the future leaders in their field. Students complete their degree with a capstone campaign course, where students integrate and apply the knowledge they gained in their undergraduate work to a single strategic communication campaign.

Students may participate in Innovative State, an Oklahoma State University student-run Media and Strategic Communications firm. Its members are high achieving students of the School of Media and Strategic Communications. The members of the firm use their talents not only to gain work experience and build their portfolios, but also to provide services to non-profit organizations on campus and in the community.

Innovative State continues to grow, take on new clients and provide opportunities for OSU students to use and develop their professional skills.

The Strategic Communication program is affiliated with the American Advertising Federation, the American Academy of Advertising, the Society of National Association Publications, the International Association of Business Communicators, the Public Relations Society of America and the Association of Women in Communication.

For more information, please go to media.okstate.edu.

Graduate Programs

The School of Media and Strategic Communications offers courses leading to the degree of Master of Science in mass communications. Preferred qualifications for admission to the master’s program include a bachelor’s degree in an area of mass communication with an overall grade-point average of 3.0. The Graduate Record Exam (GRE) is required. 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 during the first year of their graduate education.

Specialty tracks in media management, strategic communication management and sports media are offered. Basic emphasis is on the application of communication theories and research to the professional aspects of mass communication. Electives in the behavioral sciences or business management are encouraged.

Microbiology and Molecular Genetics

Tyrrell Conway, Ph.D.—Professor and Head

Microbiology/Cell and Molecular Biology. Microbiology is the hands-on study of bacteria, viruses, fungi and algae and their many relationships to humans, animals, plants and the environment. Cell and molecular biology bridges the fields of chemistry, biochemistry, and biology as it seeks to understand life and cellular processes at the molecular level. Microbiologists apply their knowledge to food production and preservation, industrial fermentations which produce chemicals, drugs, antibiotics, alcoholic beverages and various food products; biodegradation of toxic chemicals and other materials present in the environment; insect pathology; the exciting and expanding field of biotechnology which endeavors to utilize living organisms to solve important problems in medicine, agriculture, and environmental science; infectious diseases; and public health and sanitation.

Microbes live in every imaginable habitat. They generate two-thirds of the oxygen in our atmosphere, drive the geochemical cycles that make life on Earth sustainable, and are the basis of every food web. As subjects of basic research, microbes have contributed most to the current knowledge of genetics at the molecular level.

In contrast to the enormous benefits derived from some microbes, other microorganisms and viruses are the causative agents of infectious disease and hence have a devastating impact on humanity. These pathogens are the subjects of research into the mechanisms of infections, with the ultimate goal of combating or preventing diseases.

Departmental courses are designed to provide comprehensive training and the skills required for working with microorganisms in a professional setting, as well as a broad understanding of all aspects of microbial life. The lecture courses are taught by tenured faculty members and the laboratory courses are designed to integrate classroom learning with hands-on research experience.

Opportunities for employment exist at all scholarly levels, in many local, state and national agencies and industry. The record for employment of microbiologists has been excellent for many years and with the increased interest in biotechnology, medicine, and the human microbiome, employment opportunities look even brighter for the future.

Microbiology is a strong foundation for students who wish to go to medical, dental, veterinary or graduate schools. We take pride in offering research and internship opportunities that prepare students for careers in the biomedical sciences. Our graduates find jobs in medicine, health care, medical laboratories, teaching, research, industry and government.

Medical Laboratory Science Option. This option is designed to give students the broad general education and the technical skills that are required for a successful career in medical laboratory science (MLS). The minimum requirement for the BS degree in Microbiology/Cell and Molecular Biology with the MLS option is three years of university work that includes general chemistry, organic chemistry, biochemistry, immunology, genetics, anatomy & physiology, physics, upper-division courses in microbiology, and one year of clinical laboratory education (internship).

For certification and completion of the BS degree, students will take one year of clinical internship in program accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) and affiliated with Oklahoma State University. Students have the options of the following hospitals/programs: Comanche County Memorial Hospital, Lawton, OK; St. Francis Hospital, Tulsa, OK; Mercy Hospital, Ada, OK, Mercy Hospital, Ardmore, OK.

Medical Laboratory Science is unique in allowing students to enter the health profession directly after obtaining a BS degree. Clinical laboratory scientists comprise the third largest segment of the healthcare professions and are an important member of the healthcare team, working alongside doctors and nurses. Students who complete Microbiology/Cell and Molecular Biology with the MLS option enjoy a 100% employment rate upon graduation.

Graduate Programs

The department offers graduate study leading to the MS and PhD degrees in various areas of concentration, including microbial physiology, microbial genetics, microbial ecology, microbial pathogenesis, immunology, cell biology and the human microbiome.

Prerequisites. Applicants for admission must have received the baccalaureate degree from an accredited university or college and must have completed a minimum of 30 semester credit hours in the biological and physical sciences. The Aptitude Test portion of the Graduate Record Examination is required of
all applicants. A majority of the departmental graduate faculty must approve applicants.

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 thesis hours and one credit hour microbiology seminar for the traditional degree. An accelerated MS degree is available that is largely coursework and literature based, which allows completion of the degree in as little as 12 months. Literature research includes at least six credit hours in independent study.

Candidates for the MS degree are expected to attend and participate in all departmental seminars. A final oral examination (literature research for the accelerated program) is administered by the advisory committee following a public presentation of the candidate’s research.

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 the biological and physical sciences. Those entering with a master’s degree must include 15 hours in courses other than dissertation credits which were not included in the master’s study plan. Three hours of microbiology seminar must be included. Candidates for the PhD are expected to attend and participate in all departmental seminars. Candidates for the PhD degree must pass both 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/her research work.

Departments of Military Studies
Bret S. Danilowicz, PhD—Coordinator
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 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. The Army and Air Force ROTC programs offer a wide variety of four, three, and two year merit based scholarship opportunities to qualified students interested in pursuing a commission in the Army or Air Force. ROTC scholarships provide payment for tuition, mandatory fees, books, and a monthly subsistence allowance for the duration of the scholarship period. An additional universal ROTC scholarship of $1,500 per semester is awarded to 10 ROTC scholarship recipients annually. Four-year National ROTC scholarships are offered annually to high school seniors, who will be entering college in the fall semester. Scholarship applications may be obtained through local high schools, online or by contacting the University’s ROTC department. In addition, the Army ROTC Program offers four and three year Guaranteed Reserve Force Duty Scholarships to students interested in pursuing a commission as an officer in the Army National Guard or United States Army Reserve.

Flexibility. ROTC at OSU offers a variety of programs, giving the student considerable flexibility in charting a path to commissioning in the Army or Air Force. Programs are designed so those 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 students to "test the water" early in their academical 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
Lt. Col. Benjamin A. Dahlke—Professor of Aerospace Studies and Head
The basic four-year Air Force ROTC program consists of one classroom hour and one leadership laboratory period per week during the freshman and sophomore years. Additionally, at least two hours a week of physical conditioning is required. Basic courses give students a thorough background in United States Air Force (USAF) structure and history, as well as drill and ceremony, military customs and courtesies and wear of the uniform. Non-scholarship cadets enrolling in the freshman- and sophomore-level courses incur no military obligation. During the spring of the sophomore year, students compete for selection into the Professional Officer Course (POC); those selected will attend a four week field training encampment during the summer between the sophomore and junior years. For students getting a late start into the Air Force ROTC program, depending on academic major, there are three-year programs that can lead to POC entrance and eventual commission. Students who successfully complete the POC program are commissioned as second lieutenants in the United States Air Force, with a four-year obligation. Those who are selected for pilot or navigator training incur a ten-or six-year commitment, respectively.

Military Science
Lt. Col. Troy C. Buecher—Professor of Military Science and Head
Students desiring to expand the scope of their education, while preparing for a dynamic and rewarding career as an officer in the United States Army, active duty, National Guard, or Army Reserve, choose the Reserve Officer Training Corps program (ROTC) as an adjunct to their chosen field of study. With courses dealing in a wide range of subjects from leadership to tactics, taught both indoors and out, the Army ROTC program produces over 5,000 second lieutenants each year.

The Army ROTC program consists of a basic course and an advanced course. Students desiring to see what the program is like may enroll in up to 14 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 five-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. In addition there are several students who join Army ROTC in the simultaneous Membership Program in which they are both students in the ROTC and members of the Army Reserve or Oklahoma National Guard. This provides tremendous exposure and access to the many Army resources.

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 completion of commissioning requirements to include an upper division military history course. 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 two-and three-year scholarships are available through the department. Prior enrollment in military science is not a prerequisite for departmental scholarship application.

Music
Howard Potter, DMA—Professor and Head
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 (BM) in performance, (2) BM in instrumental/vocal music education, (3) BM with elective studies in business, and (4) Bachelor of Arts (BA) 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, call 405.744.6133, or check our website (music.okstate.edu) 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 (NASM), and is an All-Steinway School.
Admission Requirements. Students wishing to major in music should contact the Department of Music to arrange for an entrance audition and interview. Students are expected to maintain a cumulative graduation retention GPA of at least 2.0 while enrolled as music majors at OSU. Any student whose GPA falls below 2.0 will be placed on departmental probation. To be removed from departmental probation, students must increase the cumulative graduation retention GPA to at least 2.0. Any student who fails to meet the minimum GPA requirement in two consecutive semesters will be suspended from the OSU music program. For the purpose of determining probationary status, the number of ensemble credits that apply towards the GPA cannot exceed the total number of ensemble credits required for completion of the degree. Though a student must maintain a cumulative graduation retention GPA of at least 2.0 in order to avoid departmental probation from semester to semester, all music students must have a minimum GPA of at least 2.5 in the required major courses in order to graduate. In addition to maintaining a 2.0 cumulative graduation retention GPA, students must earn grades no lower than a C in any music class. Students who fail to pass a required music course with a grade of at least a C after two attempts will be suspended from the music major.

Applied Juries. Students are expected to pass a performance jury at the conclusion of each semester of applied study. Any students who fail to pass this jury will be placed on departmental probation. Students must also pass an upper division barrier jury prior to enrolling in upper division applied lessons. Any students who fail to pass this jury will be placed on departmental probation. Those students must re-take this performance barrier jury at the conclusion of the following semester. Any students who fail a performance barrier jury for two consecutive semesters will be suspended from the music program.

Any student suspended from the music program may re-audition for acceptance into the program, but must wait at least one year before continuing as a music major. Students who are initially suspended from the music program but are later accepted after the re-audition process will remain on probationary status for one semester. Any re-admitted student who does not meet all of the necessary minimum requirements at the conclusion of their first semester of re-admittance will be suspended from the program.

Further details of the departmental academic progress policy are published in the Undergraduate Music Student Handbook at music.okstate.edu.

Graduate Programs
The Master of Music offers the performer and conductor the opportunity to further their professional studies and/or prepare for study at the doctoral level.

For the student pursuing the conducting track, we stress challenging studies in conducting skills, repertoire, and rehearsal techniques. The degree candidate will focus on his/her particular area of specialty and will have numerous opportunities to conduct appropriate choirs, wind bands, orchestras and string groups, and chamber ensembles.

As a part of specializing on his/her instrument, the student who chooses the applied music track will develop a refined knowledge of the literature composed for that instrument and also learn the teaching and technical skills that have been developed for that musical medium. Performing opportunities, both solo and collaborative, are an important component of the degree candidate’s studies.

The Master of Music is a 32 hour degree. Each track includes courses in music research and bibliography, music theory, and music history. Elective credits that are built into each track permit the student to explore additional interests. Each degree candidate will complete a final project which contains both written and performing components. A final oral examination is also part of the degree requirements.

Admission Requirements. To participate in the master’s program, a student must first make application to the Graduate College. Prospective students must have earned a Bachelor of Music from an NASM accredited institution, or the equivalent. Students interested in the conducting track must audition on campus, or submit a video-tape of their conducting, and fill out the department of music application. Students interested in the applied music track must audition on campus, or submit an audiotape of a recent performance (minimum of 20 minutes of music), and fill out the Department of Music application for admission.

Financial Assistance. The Department of Music offers a variety of assistantships with areas of specialization including music appreciation, class piano, instrumental techniques, accompanying, and music technology. Additional scholarships may be awarded by the Department of Music.

Philosophy
Scott D. Gelfand, PhD—Associate Professor and Head
Philosophy is both an intellectual activity and a subject of study. 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 action is directed and justified. Philosophy explores every area of experience and behavior—esthetic, political, religious, scientific and moral. The ideas 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 related to the development of every academic discipline.

Courses offered in philosophy fall into three general groups: broad introductory courses that cover a variety of topics, historical courses that study important thinkers chronologically, and special topic or field courses. Some offerings combine the latter two characteristics. Few undergraduate courses are intended primarily for majors. The BA program in philosophy has been approved for offering at OSU-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 BA degree, as a second major, or in connection with a graduate program. The program in the major accommodates students of three sorts. The "general" track is designed for students who wish to explore philosophy as a general path to the refinement of their thinking, writing and speaking, and a deepening appreciation of the most fundamental and guiding ideas and values of civilization. It is a very flexible program, requiring only three upper-division courses, two upper-division historical survey courses and 19 hours of additional unspecified philosophy courses numbered 3000 or above. The "pre-professional" track is designed for students who wish to provide a philosophical foundation for their professional interests (such as law, medicine, business, public service, the ministry). Though requirements are technically the same for these students as ones on a general track, they are assigned a second advisor who helps to coordinate curricular and other activities for the best career preparation possible. The "graduate preparation" track is designed for students who are interested in pursuing graduate study in philosophy. It requires an additional six hours of upper-division philosophy and mandates more specific courses than either of the other tracks. Students may shift from track to track at any time in their matriculation without prejudice.

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 College" in this catalog for general regulations and requirements relating to admission.

The Master of Arts degree in philosophy offers a broad-based curriculum designed to serve the interests of two kinds of students:

1. Professional Emphasis: for students who wish to pursue their study of philosophy as a supplement to preparation in a wide variety of professions including business, law, government, the health professions, the ministry, or counseling. Students interested in the professional emphasis have the opportunity to choose from a wide variety of courses that support their career plans (biomedical ethics, business ethics, philosophy of law, philosophy of religion, and cognate courses in other disciplines).

2. PhD Emphasis: for students who wish to pursue their study of philosophy as a preparation for PhD studies in philosophy at another institution. Students interested in the PhD emphasis have the opportunity to enhance their understanding of the history of philosophy, logic, and metaphysics and epistemology.

Students in both of these emphases are able to compete for teaching assistantships and may teach either Critical Thinking or Introductory Moral/ Social Problems courses.

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 philosophy (PHIL 3113 or equivalent), the history of 17th and 18th century philosophy (PHIL 3213 or equivalents) and a course in logic (PHIL 3003 or equivalent). Students without these prerequisites, but otherwise admissible, may be granted "qualified" or "provisional" status until the prerequisites are satisfied.

The Master of Arts degree in Philosophy may be earned through any of three options:

1. Thesis option (twenty-four credit hours of course work plus six credit hours of research in which a thesis is written);
2. Report option (thirty credit hours of course work plus two credit hours of research in which a report is written); or
3. Creative Component option (thirty-two credit hours of course work including a creative component).

Students will prepare a plan of study under the guidance of their graduate advisor. Each student is supervised by a three-person advisory committee appointed for, and in consultation with, the student.

A student may also, in accordance with the policies of the Graduate College, select a graduate minor in connection with the master's degree in philosophy, thus permitting a concentration of work in broad areas such as social thought or cognitive science.

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 fields as economics, education, engineering, English, history, psychology, and sociology.

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Physics

Kalaj Babu, PhD—Regents Professor and Interim Head

Physics is the science of matter, energy and their interactions. Physics majors learn the fundamental laws governing the natural world, and in so doing develop critical skills of observation and quantitative analysis in both experimental and theoretical settings. Because those skills are increasingly valued in diverse fields in today's technologically sophisticated society, persons trained in physics are found not only in science, but also in fields where analytical skills are vital to success, such as finance, medicine, law and engineering.

The Department of Physics offers two bachelor's degree programs. First, the “BS in Physics” degree program is designed for students who seek a broad, comprehensive study of the set of traditional as well as contemporary topics which together comprise the subject of physics, and who ultimately may be interested in obtaining master’s and/or doctoral degrees and becoming professional physicists or astronomers. In contrast, the “BS in Applied Physics” degree program is designed for students who wish to stay in physics with a minor in another subject, or minors in physics. The detailed requirements for all degree programs of the Physics Department can be obtained from the department office or its website: www.physics.okstate.edu.

Prospective physics majors should contact the departmental advisor as soon as possible to plan a successful undergraduate career. A special freshman-level course, PHYS 1001, acquaints new physics majors with the department's professors and research, as well as with each other. During their first two years, physics majors learn the laws of mechanics (forces and motion) and electricity and magnetism. Students are encouraged to supplement work in Newton and Maxwell with courses in their chosen areas. At the same time, students develop their mathematical skills through courses in calculus and differential equations.

During their last two years, physics majors delve into advanced topics including the quantum and relativistic physics of Schroedinger, Einstein and their colleagues. Courses in laboratory and computational methods further develop experimental abilities. Students are also encouraged to work in the department's research labs or astronomical observatory. Students pursuing the BS in physics take additional physics courses and do a senior project. Students seeking the BS in applied physics replace the additional physics courses with upper-division courses in their chosen areas.

Graduate Programs

Prerequisites. Thirty semester hours of physics beyond the elementary course work and mathematics courses through advanced calculus and differential equations are normally required.

The Master of Science Degree. Students can choose between a thesis or non-thesis plan. For both plans, the required courses are PHYS 5113, 5213, 5413, 5453 and 5613. The thesis plan requires the successful completion of 30 semester credit hours beyond the BS, which include the required courses; nine semester credit hours of electives in physics, mathematics or an allied field; and the submission of an acceptable thesis along with six credit hours of PHYS 5000. The non-thesis plan is based on independent research, which is chosen in consultation with the student’s advisor. The student must successfully defend the thesis in an oral examination. The non-thesis plan requires 32 semester credit hours beyond the BS degree. Including the required courses, fifteen hours of electives (with at least nine credit hours of senior level courses), and two credit hours of library research (PHYS 5000) on a topic chosen in consultation with the student's advisor. A completed written report based on the library research must be orally presented to the student’s advisory committee. For both plans, the electives must be chosen in consultation with the student’s advisor committee.

Also available are two specialized options at the MS level. One is an option in optics and photonics, in association with the School of Electrical and Computer Engineering. Students may pursue one of two plans, both of which require 24 credit hours of course work with at least one course taken outside the student's specialization. Beyond this, the first plan (30 credit hours) requires an additional six hours of research and a successful defense of a thesis. The second plan (32 credit hours) requires an additional six hours of course work as a two-credit-hour report. The second option in medical physics is designed to prepare graduate students for clinical and research careers in medical physics, such as in proton, x-ray, and other radiation-based medical therapies. This option entails a 30 credit hour program requiring PHYS 5453 and 5613, as well as six additional courses specific to Medical Physics: PHYS 5653, 5583, 5573, 5553, and 5593.

The Doctor of Philosophy Degree. The following physics courses are required: PHYS 5113, 5213, 5313, 5413, 5453, 5813, 6313. Three additional PHYS prefix courses at the 5000 or 6000 level, including at least one course not in the student’s specialization must be completed. Additional courses required for the candidate’s specialization may be required by the advisory committee. Ninety semester hours of credit beyond the bachelor's degree, or sixty semester hours of credit beyond the master’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 eligible physics course work at the 4000 level can be counted toward graduate credit and no more than 12 total credit hours of eligible course work 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.

A Photonics PhD program shared with the Electrical and Computer Engineering Department is also available, with Physics as the home department. Details of the multidisciplinary photonics PhD program are found in the “Graduate College” section of the Catalog.

The most important single requirement for the PhD 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. Full information on graduate programs in the Department of Physics is available from the Graduate Coordinator or from the department website at www.physics.okstate.edu.

Plant Biology, Ecology, and Evolution

Tom Wilke, PhD—Professor and Interim Head

The field of plant biology, spans from molecules to ecosystems. The importance of plants to the ecosystem and to humanity can't be underestimated. They regulate global processes and form complex relationships with other organisms, and have intriguing patterns of development and diversity. Plants provide medicine, fuels, foods, fibers, and oxygen, and sustain the life of life on Earth. As human populations increase, the need for more and better supplies of food, fiber, and biofuels also increases. The study of plant biology underlies the applied sciences such as agronomy, forestry, natural resource management, horticulture, and plant pathology.

To major in plant biology a student must have a strong interest in life sciences with a good background in chemistry and mathematics. Majors with a BS degree must choose to specialize by taking the Degree Option in Ecology and Evolutionary Biology or the Option in Cell Biology and Molecular Genetics. Graduates with the first option are qualified to hold positions in federal and state agencies in areas such as conservation biology, habitat restoration, environmental biology, and plant inspection. Students taking the second option are qualified for various research positions in private industry, such as plant biology, bioinformatics, and drug development, and both may qualify for secondary education certification.

Facilities used in undergraduate teaching include well-equipped plant physiology and ecology laboratories, environmental chambers, the 160-acre McPherson Preserve, and a herbarium with over 150,000 plant specimens. Faculty members teach and do research in their specialty areas of plant biology including ecology, population biology, biodiversity, climate change, evolution, physiology, biochemical, biophysics, taxonomy and systematics, genetics and development, genomics, and cell and molecular biology.

Graduate Programs

Programs of research and study leading to the degrees of Master of Science in Plant Biology and Doctor of Philosophy in Plant Sciences.

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 must submit scores for the Aptitude portion of the Graduate Record Examination.

Prerequisites for graduate degrees include successful completion of courses in the two broad areas of 1) ecology and evolution, and 2) cell and molecular biology. Students with an undergraduate major in biology or plant science will have completed a substantial portion of these courses; those with a less closely related major may be required to take some background courses. Final authority for each student's plan of study resides with the student's advisory committee.

Degree Requirements. Demonstrated research competence through submission and acceptance of a thesis or dissertation is required for all plant biology graduate degrees. A minimum of 36 credit hours beyond the BS in plant science must be completed, including 12 credit hours of 7000 level graduate courses. This requirement may also be satisfied by enrollment in a college teaching practicum course (GRAD 5990).

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

The Master of Science Degree. Plans of study must include 30 credit hours including six credit hours of thesis and two credit hours of seminar. At least 21 semester credit hours numbered 5000 or above are required. A minimum of three graduate courses must be taken.

The Doctor of Philosophy Degree in Plant Science. The Department of Plant Biology, Ecology, and Evolution is one of seven departments participating in the multidisciplinary PhD plant science program. Students in this program have great flexibility in research and course work. The student who chooses Plant Biology, Ecology, and Evolution as a home department has a faculty advisor from within the department and will take BOT 6000 research hours in the department. To receive the PhD in plant science, students must enroll in a total of 90 credit hours beyond the BS or 60 credit hours beyond the MS. No fewer than 36 or more than 60 hours of BOT 6000 are allowed in the plan of study. Two hours of seminar (BOT 5850) must also be included in the plan of study. Students may choose as a specialization area from either cellular and molecular,
organismal, or ecological plant science. After a PhD candidate has completed most of the course work, qualifying examinations are scheduled that cover major areas of the student's plan of study and relevant subdisciplines of plant science.

Political Science

Jeanette M. Mendez, PhD — Professor and Head

Political Science is, on the one hand, an ancient discipline with roots in Plato and Aristotle, and on the other, it is one of the most recent of the social sciences with roots in the early twentieth century. Political scientists study political institutions, the political behavior of individuals and groups, the formulation of public policy, the relations among states, and also enduring moral issues, such as what is justice and how leaders should be chosen. Political science, by its very nature, blends normative and empirical issues. Questions about democracy, participation, justice, and representation have both empirical and evaluative components. The discipline attempts to understand who participates in the political process and why they do or do not participate. It means for society. A major in Political Science offers the student a front row seat in the analysis of these questions. The principal fields of study in Political Science are political theory, public law, comparative politics, international relations, public administration, and political science. Political science has great career versatility for students. While the major does focus on the subject matter of government and politics, it also develops students' critical thinking, written and oral communication, leadership and judgment. Such skills, prepare students for a wide range of options throughout their professional lives.

Graduate Programs

The Department of Political Science offers a Master of Arts degree in political science, a Master of Science degree in fire and emergency management administration, and a PhD in fire and emergency management administration.

Candidates for the Master of Arts degree in political science complete a foundation of 18 hours of study and devote their remaining hours to a specialization in two of the following areas: American politics, Comparative politics, and international relations. With specialization in areas also possible. The plan is designed to prepare professional political scientists for careers in research and teaching, as well as administrative and policy positions in local, state, or national government and international affairs.

Candidates who have significant professional experience in emergency services or have an undergraduate degree in an emergency service or related discipline may opt for the Master of Science in Fire and Emergency Management Administration. The Master of Science in Fire and Emergency Management Administration is a specialized degree designed to provide an educational foundation for those who are currently serving or aspire to serve as managers or administrators in the fire service or emergency management. Candidates specialize in one of two areas: fire services administration or emergency management administration.

Admission Requirements for the MS in Fire and Emergency Management Administration degree. In addition to the general requirements outlined above, candidates for the Master of Science degree in fire and emergency management administration must meet one of the following requirements:

1. Have significant practical experience in a fire or emergency service organization.
2. Have a bachelor's degree in fire or emergency related discipline such as fire protection technology, fire management administration, fire science, emergency management administration, or emergency management administration.
3. Meet the criteria specified in 1 or 2 above, complete a minimum of 12 hours of graduate study in fire protection and/or emergency management. Three of 12 hours must be an internship experience in fire or emergency management.

A complete application for admission to the master's program must include:

1. A completed Graduate College application submitted with a non-refundable application fee.
2. An official copy of undergraduate transcript(s).
3. Three letters of recommendation with at least one from an employer or faculty member familiar with the applicant's academic abilities.
4. TOEFL results for students for whom English is a second language. Students must have a score above 549 (paper exam) or 213 (computer exam) to be considered for admission.
5. A brief letter indicating interests and other information the applicant considers relevant.

Degree Requirements for the MA in Political Science. In addition to the general requirements of the Graduate College, requirements for the Master of Arts degree in political science are listed below.

1. A minimum of 33 credit hours in political science or closely related courses. These include: including nine required hours in research methods and foundations of Political Science (POLS 5103, POLS 5013, POLS 5023); three "proseminars" (American Politics-POLS 5703, Comparative Politics-POLS 5403, International Relations-POLS 5203); at least nine hours of electives in two subfields (American Politics, Comparative Politics or International Relations); and a three-hour "creative component" or six hour thesis. A minimum of 21 hours of political science graduate seminars ( seminars numbered 5000 or above) is required. The student must successfully defend the thesis or creative component orally before the faculty committee.
2. Satisfactory completion of comprehensive exams in two of the following areas: American politics, Comparative politics, international politics.
3. Minimum 3.00 grade-point average, with only one grade of "C*" allowed.

Degree Requirements for the MS in Fire and Emergency Management Administration. In addition to the general requirements of the Graduate College, requirements for the Master of Science degree in fire and emergency management administration include the following:

1. A minimum of 36 credit hours in political science or closely related courses. Required courses include a nine hour core of the field core requirement, a nine hour methods requirement, and twenty-one hours from any of the following: An OSU Graduate College Application fee, and official transcripts of all previous college level course work including official transcripts that verify receipt of an undergraduate and graduate major's degree.

In addition, to the materials required by the Graduate College, applicants must meet the following departmental program admission requirements and provide the following documentation:

1. Undergraduate Degree: For the Fire Administration Track, an undergraduate degree in fire science, fire management, or closely related degree. For the Emergency Management Track, an undergraduate degree in emergency management or a closely related degree.
2. Master's Degree: For the Fire Administration Track, a Master of Fire and Emergency Management Administration. Master of Public Administration, or closely related degree. For the Emergency Management Track, a Master of Fire and Emergency Management Administration, Master of Emergency Management, Master of Public Administration, or similar degree.
3. GPA: Both Tracks require a minimum cumulative GPA of 3.0.
4. GRE: For both Tracks, scores from the Graduate Record Examination taken within the past two (2) years. A combined GRE score of 1100-1300 on the verbal and quantitative general exam is preferred but not required.
5. Professional Experience: For the Fire Track, professional experience in a mid-to senior-level management position in the fire service or related first responder services is preferred, but not required. For the Emergency Management Track, professional experience in emergency management or a related field is preferred but not required.
6. Research Skills: For both tracks, evidence of strong research skills as evidenced by research related course work and grades recorded on official transcripts and examples of authored research documents included in the Application Portfolio (see below).
7. English Language Proficiency: For international students, both Tracks require a minimum TOEFL score of 101 (Internet) and 607 (paper).

8. Application Portfolio that includes a current resume, three letters of recommendation, a career goals essay, and copies of published materials authored by the candidate.

Degree Requirements for the PhD in Fire and Emergency Management Administration.

In addition to the coursework, the Doctoral candidates must have completed a master's degree. In addition, they must complete 39 hours of required common course work that includes 15 hours in a common core, 9 hours of research tools, and 24 hours of dissertation research. An additional 21 hours of courses are required in either a fire service administration track or an emergency management administration track. Finally, candidates must take oral and written qualifying exams and must successfully defend their dissertation before their dissertation committee. Most courses in the FEMP PhD program are conducted in the department's state-of-the-art virtual classroom, where both on-site and off-site students participate simultaneously in the same class sessions.

Psychology
Thad Leffingwell, Ph.D.—Professor and Head

The student pursuing a BA or BS 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 a variety of vocational opportunities. In addition, students may take advantage of opportunities to work with faculty in research or in teaching to gain additional experience. Such experiences are especially helpful to those students wishing to pursue graduate education in psychology or related fields.

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 licensure or certification to teach psychology in the schools, it is possible to earn a teaching certificate or license in social studies education with endorsement in psychology while pursuing a major in psychology. Persons interested in such teaching should contact the Office of Professional Education. (See "Professional Education Programs" in the "College of Education" section of the Catalog.)

The department also offers courses in speech communication to enhance the student's ability to effectively communicate in the interpersonal, organizational and public contexts. Both conceptual knowledge and practical application are stressed to prepare students to begin careers in business and industry, or to enter graduate or professional schools.

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, experimental psychology, history and systems. Abnormal psychology is recommended for students applying to the clinical program.

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 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 requirements, the student may be admitted to doctoral status in Clinical Psychology or Experimental Psychology.

Religious Studies

Bruce Crabbe, PhD—Director

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. Many of the undergraduate courses enable students to satisfy humanities requirements and also provide an excellent background for many types of graduate and professional programs.

Sociology

Sharon Bird PhD—Professor and Head

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

The diversity of the faculty is reflected in the many different types of courses offered. Topics include environment and population, criminology, law and society, organizations, inequality, social psychology, race, ethnicity and gender. Many undergraduate majors take advantage of the applied research option by selecting supervised work-related internships.

The Department of Sociology offers BA and BS degrees in general sociology and applied sociology. The general sociology degree provides students the opportunities 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 option focuses on law, crime and social justice, environment and social services and provides practical experience for work in a variety of settings.

The option in anthropology provides students with a basic introduction into methods, theory and principles of cultural anthropology, archaeology, and physical anthropology. Regular course offerings introduce students to past and present cultures within and outside the United States.

Graduate Programs

The Department of Sociology offers the Master of Science degree with a thesis, or non-thesis (terminal degree) options, and the Doctor of Philosophy degree. Programs are designed to prepare students for appointments to the faculties of colleges and universities, to work in private industry and social service agencies, and for research positions in business and government. The department offers concentrations in environmental sociology, social inequality, social movements, deviance and criminology, and social psychology.

Degree Requirements. The MS in sociology, thesis option, requires a minimum of 31 hours of course work. The MS in sociology, non-thesis option requires 32 hours of course work. For students pursuing the PhD, a minimum of 90 semester credit hours beyond the baccalaureate, or 60 hours beyond the master's degree, is required. Each PhD student is required to take six hours of sociological theory, and 15 hours of research methods/statistics. Detailed information on each program is available on the Departmental website.

Statistics

Mark Payton, PhD—Professor and Head

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

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

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

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

The Statistical Laboratory operates within the department to provide statistical consulting to researchers—both faculty and student—across the campus. The Department of Statistics offers the BS and MS degrees to those interested in applications of statistics, and the PhD degree to those who wish to make original contributions to the theory of statistics.

Graduate Programs

Admission Requirements. It is necessary to have an undergraduate degree, not necessarily in statistics or mathematics, to begin a program of study toward the master's degree in statistics. In some instances, it may be advantageous to have an undergraduate degree in another field. However, the student should have acquired a good mathematical background as an undergraduate. This should be equivalent to the required mathematics courses in the bachelor's program (MATH 2144, 2153, 2163, 3013, 4013). Students admitted to the program with deficiencies will be required to remedy such deficiencies.

The Master of Science Degree.

The Master of Science degree in statistics is designed to prepare students for work as a statistician or doctoral studies in statistics. It 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 student will be required to attain an introductory knowledge of some field of application outside of statistics, mathematics and computer science. This requirement may be satisfied by having taken a three-hour graduate course in an approved field of statistical application. Each student is required to have demonstrated competence in a procedure-oriented language such as FORTRAN.

The Master of Science in Applied Statistics Degree. The Master of Science in Applied Statistics (MSAS) degree can be completed with online coursework. It is intended to be a terminal professional master’s degree. It is not intended to be preparation for doctoral work in statistics. Neither comprehensive exams nor a thesis or formal report is required for completion of this degree. A two-hour creative component course is required at the end of the matriculation through the program. More information regarding this degree can be found on the OSU Statistics Department website.

The Doctor of Philosophy Degree. The PhD requires the completion of 90 hours beyond the BS degree. A maximum of 30 of these credit hours may be earned by research for the dissertation. Each student will be required to attain an introductory knowledge of some field of application which may be satisfied by taking two three-hour graduate courses outside the fields of statistics, mathematics and computing. Each student is required to have completed CS 1113 or to have demonstrated competence in a procedure-oriented language such as FORTRAN.

Theatre
Andrew Kimbrough, PhD—Professor and Head
The Department of Theatre offers the Bachelor of Arts in Theatre degree and minors in Theatre and Dance.

The BA degree is a generalist degree, designed to provide a broad background in practical and theoretical areas while allowing students to develop an area of emphasis. The BA in Theatre is a comprehensive 48 hour degree with coursework in performance, technical theatre, directing, design, theatre history and dramatic literature. Students may elect an emphasis in performance, technical theatre and design, or a combination of performance and design/tech. This degree program is ideally suited for students interested in several areas of performance and production and who desire a comprehensive education in every aspect of theatre. The size of the degree plan allows for students to pursue a double major or minor in another discipline.

An active production program in two well-equipped theatre spaces augments course work. The regular production schedule consists of four faculty-supported main stage productions each year and two to four studio productions that are primarily directed, designed, and performed by students. Students also have the opportunity to study with a variety of guest artists and scholars during each academic year.

In addition to professional careers in acting and production, this major can lead to careers in arts management, teaching, law, counseling, or any career area where effective personal communication, team work, problem solving, and creativity are essential.

Graduate Programs
The department offers course work leading to the Master of Arts degree in Theatre. The Master of Arts degree in Theatre is an initial graduate degree designed to build on students' individual theatre skills and to deepen a student's theoretical and practical understanding of the art form. Accepting only a limited number of students each year, the program affords a great deal of individual contact with faculty members and considerable latitude in developing the plan of study.

Graduate candidates take a central core of graduate level courses in theatre history, theory, and directing, augmented by other courses available in the department and the university to develop and support their areas of special interest. Typically students accepted into this degree program pursue careers in professional theatre, become teachers in secondary schools or two-year colleges, or they prepare for the pursuit of advanced degree work in a Master of Fine Arts or Doctoral program.

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 Catalog.

A limited number of graduate teaching assistantships (GTA’s) are available to highly qualified students. Information and application information may be obtained from the department head.

Undergraduate credentials should be referred to the department graduate program coordinator for evaluation to assist advisement and to determine any possible deficiencies that will affect the admission status.
College of Education

College Administration
John Romans, PhD—Dean and Director of Professional Education
Juliana Utley, PhD—Interim Associate Dean for Research Engagement and Graduate Studies
C. Robert Davis, PhD—Associate Dean for Academic Affairs, Administrative Support and Outreach

Campus Address and Phone:
106 Willard, Stillwater, OK 74078 — 405.744.6350
Website: education.okstate.edu

The College of Education (COE) includes the schools of Applied Health and Educational Psychology, Teaching and Curriculum Leadership, and Educational Studies. The College offers a wide range of undergraduate and graduate programs to prepare individuals for careers in teaching, administration or research in the professional field of education either in the public schools or in institutions of higher education. There are a variety of degrees within the College at the bachelor’s, master’s, specialist and college level that prepare individuals for productive lives in the global community (see the “Degree Programs” section of the Catalog).

Accreditation
In the College of Education, the Aviation Management and Professional Pilot options are accredited by the Aviation Accreditation Board International (AABI). The counseling psychology program and the school psychology program are accredited by the American Psychological Association. The school psychology program is also accredited by the National Association of School Psychologists. The counseling program with options in Community Counseling and School Counseling are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The leisure studies program with options in leisure service management and therapeutic recreation, is accredited by the National Recreation and Park Association in cooperation with the American Association for Leisure and Recreation. Athletic training is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). All professional education programs are accredited by the Council for the Accreditation of Educator Preparation (CAEP) formerly named the National Council for Accreditation of Teacher Education (NCATE). Office of Educational Quality and Accountability (OEQA), and the North Central Association of Colleges and Secondary Schools. Career and Technical education professional education programs are also accredited by the Oklahoma State Department of Career and Technical Education.

Statement on Diversity
The College of Education is committed to the promotion and affirmation of diversity in the broadest sense. We highly value the dignity and worth of individuals inclusive of their gender, race, ethnicity, nationality, sexual orientation, age, physical and mental abilities, religious beliefs, socioeconomic class, and other identities. Valuing diversity also extends to diversity of thought and perspective. We promote and create a dynamic community for personal transformation and social change with an atmosphere of respect and trust in which individuals explore, discuss, and express their beliefs with one another.

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 students be involved in clubs and organizations as well as have had some experiences working with children and youth, or other experiences related to their chosen fields.

Admission Requirements
Freshman students are admitted to the College of Education consistent with criteria published for admission to the University. Students pursuing degree options in career and technology education non-certification option or leisure are required to maintain a 2.00 GPA. Students pursuing a degree in Elementary Education or Health Education and Promotion are required to maintain a 2.75 GPA. All other degree options require a 2.50 GPA.

For continuing enrollment in good standing, the Professional Education Unit and some other programs require a minimum of 2.50/2.75 GPA for admission to Professional Education, student teaching, and graduation. This requirement is consistent with state standards for students in the state of Oklahoma who complete professional education programs and seek certification.

Requests from students seeking readmission after having been placed under probation/suspension should be submitted to the Watson Family Student Success Center in the College of Education and will be reviewed by the Director of Student Academic Services prior to readmission. 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 Certification in Professional Education, the following minimum GPAs are required: (1) a 2.50 overall GPA (Elementary Education requires a 2.75); (2) a 2.50 GPA in the Major Requirements except Elementary Education and Secondary Education English which requires 2.75; (3) a 2.50 GPA in Professional Core Requirements (2.75 for Elementary Education); and (4) where noted, a 2.50/2.75 GPA in the College/Departmental Requirements. The student may earn 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 “C” or “P” in all sections of observation (lab and clinical experience) courses and clinical practice for recommendation for Certification.

Scholarships
The College of Education offers scholarships for undergraduate and graduate students in the School of Applied Health and Educational Psychology, School of Teaching and Curriculum Leadership and the School of Educational Studies. An up-to-date listing for COE Scholarships can be found at education.okstate.edu/students/scholarships.

Abercrombie, Betty Memorial Endowed Scholarship
Adams, Cathy Endowed Scholarship, A Son’s Final Gift
Adkins, Mike Memorial Scholarship
Albers, L. Mignon Scholarship
Allgood Family Scholarship
Bellmon, George D. and Edith Eleanor Caskey Endowed Memorial Scholarship
Benson, Ann and Gene Endowed Scholarship
Berlin, Grace, James and Tammy Scholarship
Bird, James and Gary Bird Memorial Endowed Scholarship
Blair, Mary Frances Endowed Scholarship in Aviation
Bliss Family Aviation Management Scholarship
Boeing Company Aerospace Logistics Scholarship
Bradley, John W. Memorial Endowed Scholarship
Branstetter, Olin R. and Paula G. Aviation Endowed Scholarship
Briggs, Lloyd & Mary Ann Endowed Scholarship
Brown, David W. & Karen Bale-Brown Education Scholarship
Brown, Ray E. Memorial Endowed Scholarship
Broyles-Willard Family Endowed Scholarship
Buckles, William R. and Billie D. Endowed Scholarship
Burgess, Bob Scholarship
Burke, Jim and Linda Scholarship
Burson, Jerry and Mary Endowed Scholarship
Caruthers, Kent & Flora Scholarship
Cashel, Christine Endowed Professional Educational Scholarship
Celebration of Teaching Scholarship
Changing Seasons Scholarship in Education
Chauncey, Vera Jones Memorial Endowed Scholarship
Christiansen Aviation Scholarship
Close, Bryan, Transfer Student Scholarship
College of Education Alumni Association Undergraduate Endowed Scholarship
College of Education Alumni Association Freshman Endowed Scholarship
College of Education Alumni Association Endowed Scholarship
College of Education Alumni Association Graduate Endowed Scholarship
College of Education Associates Endowed Scholarship
College of Education Associates Graduate Scholarship in Teaching
College of Education Dean’s Academic Excellence Scholarship
Collins, W. Opal Eastep Endowed Scholarship
Cohn, Valerie Endowed Scholarship
Cooper, Dr. Donald Endowed Scholarship in Athletic Training
Cornforth, Patricia Scholarship
Crawford, Kristen Elementary Education Scholarship
Cumberledge, Gretchen Lynette Memorial Scholarship
Cunningham, Mary Marie Memorial Endowed Scholarship
Cusick Family Endowed Scholarship
Dickman, Marcia Endowed Scholarship
Dickman, Marcia Endowed Scholarship
Dorsey, Billy J. Endowed Scholarship for Aviation Education
Dotson, Rachel Endowed Scholarship
Dugger, Cecil & Geneva Higher Education Scholarship
Dugger, Cecil & Geneva Higher Education Scholarship
Dugger, Tom J. and H. Ann Endowed Scholarship
Earls, Larcisha Diane Stephens Memorial Endowed Scholarship
Ebert, Bill and Nita Scholarship
England, Paul and Martha Family Scholarship
Eriksson, Alice R. Memorial Endowed Scholarship
Eskimo Joe’s Future Teacher Endowed Scholarship
Esslinger, Charles A. Outdoor Recreation Endowed Scholarship
Flying Cowboys Scholarship
Frye, Drs. Mary & Moses Endowed Scholarship
Gerfen, Kevin A. Scholarship Fund
Gicrease, Thomas Foundation Endowed Scholarship in Aviation
Hall, Roy & Wanda Endowed Scholarship
Harder, James Endowed Scholarship
Harrison, A.B. Endowed Scholarship
Hartman, Captain Larry L. Endowed Scholarship in Aviation
Hatfield, Richard G. and Melody N. Endowed Scholarship
Havner, Dr. Roberta R. Memorial Endowed Scholarship in Career and Technical Education
Hedrick, Frank E. & Harriet E. Aviation Endowed Scholarship
Henderson, Ora A. Memorial Endowed Scholarship
Herd, Daniel & Mary Memorial Endowed Scholarship
Hodges, Helen Aviation Scholarship
Holley, J. Andrew Memorial Endowed Scholarship
Holmes, Viola Lacher Endowed Scholarship
Horner, Jo Griffith Endowed Scholarship
James, Johney and Kevin Aviation Endowed Scholarship
Jameson Family Endowed Scholarship
Jarman, Ron & Sandy Powell Jarman Endowed Scholarship in Gifted Education
Jeskey, Arlene Starwalt Scholarship in Math Education
Jewell, Jan Endowed Scholarship
Johnson, John & Valerie Family Scholarship in Education
Jones, Helen M. Endowed Scholarship
Jones, SFC Nick Nicholson Scholarship in Aviation Leadership
Jordan, Henry S. and Wanda Family Endowed Scholarship
Jordan, Martha Endowed Scholarship
Jungers, Richard & Edna Endowed Scholarship
Kamm, Robert & Maxine Distinguished Graduate Endowed Fellowship
King, Kenneth & Peggy Endowed Scholarship
Kinklead Family Endowed Scholarship
Knaub Robert & Patricia Endowed Scholarship
Knce, Anton and Pearl Scholarship
Kunze, Lawana Scholarship
Ledbetter, Myron C. Diversity Endowed Scholarship
Leid Family Endowed Scholarship
Lentz, Gary Memorial Flight Scholarship
Linehan, John C. & Caroline S. Endowed Scholarship
Locke, Wright, Foster, & Cross Educational Endowed Scholarship
Long, Hal & Jean Endowed Scholarship in Elementary Education
Looper, Lura Schoenleber Memorial Endowed Scholarship/Elementary Education
Lotven Family Endowed Scholarship
Luinstra, Brian Memorial Endowed Scholarship in Athletic Training
Lynn, Harry and Betty Memorial Endowed Scholarship
Marks, Steven and Janet Endowed Scholarship
Marsh, Anne Endowed Scholarship
Martin, Jim E. Scholarship
McGehee, Janet Bourland Family Endowed Scholarship
McMaster, James H. Flying Aggies Endowed Scholarship
McMullen, Colleen & George Endowed Scholarship
Mills, Terence J. Endowed Scholarship in Environmental Education
Miskel, Dr. Cecil College of Education Graduate Student Scholarship
Morgan, Clayton A. Excellence Endowed Scholarship
Morsani, Frank L. & Carol D. Endowed Scholarship - Undergraduate
Morsani, Frank L. & Carol D. Endowed Scholarship - Graduate
Morrison, Jaydene Scholarship
Mosier, Richard Harper Leadership in Higher Education Endowed Scholarship
Munson, Leon L. Memorial Endowed Scholarship
Neilson, Tracey Waterfield Memorial Endowed Scholarship
Nemecek, Col., Glen Aviation Endowed Scholarship
Noble, Judy Endowed Scholarship
Oaks, Mable Marietta Macey Memorial Art Endowed Scholarship
Oaks, Percy W. Sr. Memorial Art Endowed Scholarship
Oklahoma Teacher of the Year (OKTOY) Endowed Scholarship
Parrack, Doyle Endowed Scholarship
Patel Elementary Education Endowed Scholarship
Peacher, Lynn Bill Endowed Scholarship
Phillips, David Eloy Family Endowed Scholarship
Pitts, Joel G. Aviation Endowed Scholarship for Professional Pilot Training
Poe, Ron and Carolyn Scholarship
Pooman, Mary Elizabeth Choate and Ralph U. Pooman Memorial Scholarship
Price, Emma Ingersol Scholarship
Prince, James Leonard Endowed Memorial Scholarship
Ray, Darrel D. Scholarship
Reitermeier, Georgen Wallace Endowed Scholarship
Rezabek, Frankie Bohanan Endowed Scholarship
Rollins-Wade, Myr-Lou Endowed Scholarship
Rowley, George A. & A. Fern Endowed Scholarship
Schwarz, Donna Scholarship
Seidle Family Foundation Endowed Scholarship in Education
Sharpton, Wendell Family Endowed Scholarship
Shaw, Dr. Terry Memorial Scholarship
Shaw, Thelma Sewell Memorial Scholarship
Shriver, Madeline D. Endowed Scholarship
Smee, Kathryn, Alumni Doug and Dau Wilson Endowed Scholarship
Smith, Steven and Rebecca Endowed Scholarship
Smith, Thomas J. Endowed Scholarship
Smith, Thomas J. Freshman Student Recruitment Scholarship
Sorensen, Helmer & Frances Endowed Scholarship in Educational Leadership
Spradling, Scott and Suzanne Science Education Endowed Scholarship
St. Clair, J. Kenneth Endowed Scholarship
Stone, Lana B. Diversity Endowed Scholarship
Stone, Toni and Bill Endowed Scholarship
Sumpter, Mildred H Endowed Scholarship
Sutton, Eddie Endowed Scholarship in COE
Trammell, Jane Memorial Endowed Scholarship
Tuttle, Francis Visionary Leadership Fellowship
Ulrich, John Memorial Endowed Scholarship
Vanegift, James R. Memorial Endowed Scholarship
Vermillion, Robert, Francille, Harry, and Jon Endowed Scholarship
Wagner, Amy Louise Endowed Scholarship
Waits, Gene Endowed Scholarship
Walker, Don and Jackie Endowed Scholarship
Waterfield, R. Bruce and Robert D. Raab Athletic Training Endowed Scholarship
Watson, Kim R. Endowed Scholarship in Education
Watson, Kim R. President’s Distinguished Endowed Scholarship
Wheeler, Mary Echo Endowed Scholarship
White, William Endowed Scholarship
Wiggins, Lloyd L. Memorial Endowed Scholarship
Wiggins, Kenneth & Margaret Aviation Endowed Scholarship
Williams, John K. and Beverly F. Family Trust Scholarship
Winter, Pauline Endowed Professional Scholarship
Womack, Katie Memorial Scholarship
Wyers, Ruth Oteka Endowed Scholarship
Xerox Corporation Endowed Scholarship
Yasik, Christine Kunkel Endowed Scholarship

Watson Family Student Success Center

Academic Advising

Academic advisement for undergraduate students is provided by the Watson Family Student Success Center, located in 106 Willard, in the College of Education. Students are assigned to a particular academic adviser in the Watson Family Student Success Center depending on the student’s declared major. Academic advisers confer with their advisees on such matters as vocational counseling, course selection, academic problems, long-range professional goals, and semester by semester enrollment.

The requirements for the degree being sought are made known to the student when he or she first enrolls at Oklahoma State University. While the curriculum may change before a student graduates, a student who makes normal progress toward graduation (no more than two years beyond the normal four-year bachelor's degree requirements) will be held responsible for the degree requirements 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 delay graduation.

Collegiate Success Program

The goal of the Collegiate Success Program is to assist students with their success in the classroom. This program individualizes assistance for those students who have been placed on academic probation. The Collegiate Success Program has three objectives which include:

• Assisting students in identifying individual strengths and needs.
• Assisting students in establishing academic goals based on those strengths and needs.
• Providing students with the skills necessary to succeed at the collegiate level.

For more information logon to education.okstate.edu.

Graduation Check

The College of Education Office of Student Academic Services prepares a graduation check that indicates the undergraduate's status toward completion of degree requirements. For those students in Professional Education, teacher licensure requirements are included in the graduation check. Undergraduates may request, through their academic advisers, that the graduation check be completed. Students can review degree progress on the web (SIS web for students).

Career Services

The College of Education has a career consultant available. The career consultant provides seminars and one-on-one advisement in career-related topics such as job search strategies, resume development, interviewing skills, and career transitions. The services are available to undergraduate and graduate students and alumni. The career consultant also partners with many employers, including school districts, hospitals, non-profit organizations, and corporations, encouraging them to hire OSU graduates from the College of Education.
Special Academic Programs
OSU Teach. The OSU Teach program is designed to recruit and train new secondary teachers in science and mathematics. OSU Teach offers four-year STEM degree options in biological science, chemistry, geology, mathematics, and physics, which lead to teacher certification at the secondary level. OSU Teach is a collaboration between the College of Education and the College of Arts and Sciences. OSU Teach students begin supervised teaching in K-12 classrooms during their first semester in the program and continue these field experiences throughout their coursework, which culminates with apprentice teaching.

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 students may be met by working with a faculty committee and academic advisors in selecting a specially-tailored program that ultimately leads to a degree.

The Honors College. Outstanding students in the College of Education who meet the requirements of the Honors College may earn The Honors College degree while completing their undergraduate degree in this college. For more information, please refer to the Honors College information in this Catalog.

Tutoring Program. The Reading and Math Learning Center within the School of Teaching and Curriculum Leadership offers elementary education undergraduate and graduate students a faculty-supervised opportunity to tutor school-age children interested in improving their reading and math skills.

Professional Development Conferences. Additional outreach conferences may include the Oklahoma Association of Elementary School Principals, the Oklahoma Association of Environmental Educators; the Oklahoma Education Association Annual Leadership Academy; and the Adult Basic Education Conference.

Alumni Association. The College of Education Alumni Association distributes a quarterly newsletter to over 3,000 active members. The organization provides professional support and an immediate network of professional contacts. The Alumni Association provides scholarships for students in the College of Education. Graduates attending commencement receive an invitation for a one-year complimentary membership to the Alumni Association. The organization also sponsors a Homecoming reception and other welcome events for students and faculty gatherings.

General Education Requirements
All undergraduate degrees in the College of Education require a minimum of 40 semester hours in general education that include the following: English Composition, analytical and quantitative thought, United States history and government, natural science, social and behavioral studies, arts and humanities, diversity, international dimension and electives. All degrees are consistent with the current University General Education requirements and the Oklahoma State Board of Education standards.

Departmental Clubs and Honor Societies
Athletic Training Student Association
College of Education Graduate Student Association
Education Student Council
Elementary Educators of Tomorrow
Flying Aggies
Health Promotion Club
Kappa Delta Pi (education honor society)
Kappa Kappa Iota
Leisure Club
Phi Epsilon Kappa (health, physical education, leisure honor society)
Physical Education Club
School Psychology Graduate Student Organization
Student Ambassadors
Student Education Association

Education Outreach and International Studies
Education Outreach and International Studies work together to facilitate the delivery of COE course work and academic programs. Consistent with the OSU mission and in conjunction with faculty and academic programs in the COE, Education Outreach and International Studies provide support, services and programs to meet the professional needs of educators advancing the state of Oklahoma and the nation while promoting and facilitating engagement of the college and university with state, national, and international communities.

The goals of Education Outreach and International Studies are to reflect the expertise and promote the accomplishments of the College of Education faculty and staff and to foster activities and learning that develop faculty and students for multiple futures. Specifically, these offices work to:

- facilitate campus-based degree credit which enables students to pursue their academic goals in ways that fit their schedule and personal situations;
- extend off-campus degree programs to individuals pursuing degrees and professional certifications through a variety of different methods;
- provide opportunities for international experiences linking campus faculty and students to a wide range of global locations through travel trips, student teaching, and cohort programs;
- assist workforce development initiatives through non-credit educational opportunities for employed adults in educational and governmental environments;
- coordinate professional conferences for the educational community, including school professionals and administrators, educational associations, and state organizations; and
- offer a wide array of community development and cultural enrichment opportunities.

School of Applied Health and Educational Psychology
Julie M. Koch, PhD—Associate Professor and Interim School Head

The School of Applied Health and Educational Psychology encompasses undergraduate and graduate academic programs in athletic training, health education and promotion, physical education, leisure studies, community counseling, counseling psychology, educational psychology, school counseling, school psychology, and health and human performance. The School seeks to fulfill the traditional functions of teaching, research, outreach, and public service that are consistent with the mission of Oklahoma State University. The mission is to foster the development, integration, and application of knowledge, theory, skills and experiences to promote social, physical, psychological, educational, and environmental health. Consistent with the goals of the University's Professional Education Council's Core Concepts and Goals Statement, faculty strives to demonstrate and perpetuate teaching based on theory and research-driven educational practices.

Course Prefixes. Courses that support educational psychology and school psychology and gifted education are listed in the Catalog under the EPSY prefix. Courses that support counseling and counseling psychology are listed in the Catalog under the CPSY prefix. Undergraduate programs in Recreation Management and Therapeutic Recreation use the RMTR prefix while activity and graduate leisure courses use the LEIS prefix. Courses in health and human performance are listed in the Catalog under the HHP prefix. Courses in physical education, health education and promotion, and athletic training also carry the HHP prefix.

Degree Opportunities. A student may earn a degree of Bachelor of Science (BS), Master of Science (MS), Specialist in Education (EdS), or Doctor of Philosophy (PhD) with emphasis in one of the following:

Programs/Areas of Emphasis

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<th>Degree</th>
<th>Counseling/Counseling Psychology</th>
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<td>MS</td>
<td>School Counseling</td>
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<td>MS</td>
<td>Counseling Psychology</td>
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Educational Psychology

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<td>EdS, PhD</td>
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<th>Health and Human Performance</th>
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<td>Leasure, Leisure &amp; Human Performance</td>
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<td>PhD</td>
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Counseling and Counseling Psychology
Hugh Crethar, PhD—Associate Professor and Coordinator

The counseling and counseling psychology program areas offer graduate programs in mental health counseling and school counseling leading to the MS degree in counseling as well as a PhD degree in educational psychology, with an option in counseling psychology.

Mental Health Counseling
Tonya Hammer, PhD—Assistant Professor and Program Director

MS Program. This program 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 specification such as youth counseling, substance abuse counseling and mental health counseling. The program is designed to meet the academic requirement for licensure as a professional counselor in Oklahoma and the standards set by CACREP for national accreditation. Application materials for this program are due February 1st for the following summer or fall enrollment.
School Counseling
Tonya Hammer, PhD—Assistant Professor and Program Director

MS Program. This program prepares students to work as counselors in public schools, serving students, teachers and parents. The role of the school counselor is to coordinate the comprehensive school counseling program, focusing on the educational, career, personal and social development of students. Within this comprehensive school counseling program, school counselors provide counseling, consulting, coordinating, and appraisal services. The school counseling program is designed to meet the certification requirements for the State of Oklahoma as well as requirements of the Council for Accreditation of Counseling and Related Educational Programs (CACREP). Application materials for this program are due February 1st for the following summer or fall enrollment.

Counseling Psychology
Carrie Winterowd, PhD—Professor and Training Director
Thomas Berry, PhD—Clinical Associate Professor

PhD Program. This program is accredited by the American Psychological Association and is based on the scientist-practitioner model of training. The program is designed to prepare students for counseling, consulting, teaching and research roles in various settings such as university counseling centers, academic departments, hospitals, public service settings such as prisons and Veterans Administration Medical Centers, business settings, mental health clinics, and community settings. Students are required to follow a specified sequence of study in which academic course work and practicum experiences are integrated. Students must also complete one year of full-time internship. Application materials for the counseling psychology program are due by December 1st for the following summer or fall enrollment.

Educational Psychology
Michale S. Yough, PhD—Assistant Professor and Coordinator

MS Program. A master’s degree in educational psychology is available as an option within the MS in educational psychology. Educational psychology emphasizes the application of psychological theory and research in the field of education. Every educational psychology master’s student takes basic courses in educational psychology and research. For more information, see the website http://education.okstate.edu/graduatesudies/ms. We have an option application for the MS degree in educational psychology.

PhD Program. The PhD in educational psychology includes areas of study in learning motivation cognition, instructional psychology, and human development. The programs prepare students for the role of teacher and researcher in educational and non-educational settings such as higher education, business, government, and communities.

The educational psychology PhD program is designed to provide students with maximum opportunity to individualize their programs according to their own interests, needs and professional goals. Applications for the PhD program in educational psychology are due by February 1 for the following fall enrollment. For more information, see the website http://education.okstate.edu/graduatesudies/phd.

School Psychology
Brian Pouncy, PhD—Associate Professor, EdS—Program Training Director

MS Program. A degree in educational psychology with an option in school psychometrics is awarded to students who are on route for either the EdS or PhD degree in school psychology. Students must be admitted to the EdS or PhD program to receive the MS. (Students are not admitted directly to the MS degree.)

EdS Program. The NASP-approved (National Association of School Psychologists) specialist program is available. The EdS is the appropriate level of training for those who are interested in applying psychology to a variety of child-related learning and adjustment problems, and for the improvement of children’s mental health in school settings. Specialist-level school psychologists typically work in school systems and function in diverse roles including consultation, psychological and psycho-educational assessment, and intervention to facilitate success for all children. The EdS program at OSU is approximately 77 hours, consistent with the NASP standards for training, and meets the Oklahoma State Department of Education certification requirements. Successful completion of this program leads to eligibility for certification by the Oklahoma State Department of Education as a school psychologist and also the NASP National Certification in School Psychology (NCSP). Applications for the EdS program are due February 1 for consideration for admittance the following semester.

Gary Duhon, PhD—Professor and PhD Program Training Director

PhD Program. The doctoral program in school psychology is accredited by the American Psychological Association and approved by the National Association of School Psychologists. The program follows the scientist-practitioner model that emphasizes the application of the scientific knowledge and methodological rigor in the delivery of school psychological services and in conducting research. Training in the scientist/practitioner model is for the purpose of developing a Science-Based Child/Learner Success orientation in students. Doctoral level school psychologists function in diverse and important roles including consultation, assessment, intervention therapy, supervision, program evaluation, and research to facilitate success for all learners. They add to the understanding of children and their families by contributing to the scientific knowledge base related to all aspects of child development. They are employed in many different settings including elementary and secondary schools, private practice, university, hospitals and mental health centers. School psychologists work with diverse populations and provide psychological services to children, youth, families, caregivers, school personnel, adult learners, and individuals with special needs, as well as to other systems in which these individuals need to be successful. Applications for the PhD program in school psychology are due by January 1 for the following fall enrollment.

Health and Human Performance
Doug Smith, PhD—Professor and Coordinator

The programs in health and human performance prepare students at the undergraduate level for careers in athletic training, health promotion, and physical education.

Health Education and Promotion
Bridget Miller, PhD—Joan Donelson Jacques Endowed Professor of Health Promotion and Program Coordinator

The health education and promotion program prepares students to provide preventive and rehabilitative services in a variety of settings including workplaces, health care facilities, community agencies, schools/universities, and governmental agencies. Students culminate their degree requirements with a semester-long internship during their final semester. This degree track prepares students for credentialing opportunities such as the Certified Health Education Specialists and certifications offered through the American College of Sports Medicine.

Physical Education
Tim Baghurst, PhD—Associate Professor and Program Coordinator

The undergraduate program includes a curriculum designed for professional preparation as a certified teacher of physical education, PK-12. Core courses for all physical education students include science-based courses, teaching methods, health and content-specific courses. Students engage in two formal field-based experiences: (1) a 45-hour practicum consisting of on-site observational experiences in one or more public school settings; and (2) a clinical experience (student teaching) in elementary and secondary schools during the final semester. A minor in Coaching Science is also offered, for which a student does not need to be a Physical Education major.

Graduate Program
Doug Smith, PhD—Professor and Graduate Coordinator

MS in Health and Human Performance. The health and human performance program provides preparation at the master’s level with three option choices: health promotion, applied exercise science, and athletic training.

PhD in Health, Leisure and Human Performance. The purpose and focus of this program is to prepare excellent entry level research scholars for formal and informal learning organizations. They may serve in such roles as faculty members at colleges and universities and scholar practitioners in the workplace. The options included in the degree program help students to develop experiences that will allow them to meet career needs and goals through (1) interactive, collaborative research, (2) teaching experience, (3) university and professional service, and (4) outreach and extension appropriate to a land-grant university. The options in (1) health and human performance and (2) leisure studies are designed to permit flexibility within the disciplines encompassed by the degree while assuring that all students in the program are provided the opportunity to develop research skills which facilitate functioning as future faculty members or scholar practitioners.

Recreation Management and Recreational Therapy (Undergraduate Program)
Tim Passmore, EdD, CTRS/L—Associate Professor and Program Coordinator

The program in Recreation Management and Recreational Therapy Program at Oklahoma State University prepares students at the undergraduate and graduate levels for careers in recreation management and recreational therapy. The undergraduate program in Therapeutic Recreation is accredited through the Committee on Accreditation of Recreational Therapy Education by the Commission on Accreditation of Allied Health Programs. Students completing the Recreational Therapy program are eligible to sit for the National Council for Therapeutic Recreation Certification (CTRS) and apply for Medical Licensure in the State of Oklahoma through the Oklahoma Medical Licensure Board. Those students completing the Recreation Management program are eligible to sit for the Certified Park and Recreation Professional certification through the NRPS. Recreational therapy prepares students to work in a variety of settings including hospitals, rehabilitation centers, day programs, institutions and within the community.
Recreation Management prepares students for employment in a variety of settings such as municipal, commercial, and corporate recreation; state and national park services; YMCA and YWCA's; and armed services recreation. Therapeutic recreation is a valued part of the health care and human services. Individuals with illness, disabilities or limitations are helped to restore, enhance or maintain their health, independence and well-being through recreational activities. Recreation Management is a growing field and is a multi-billion dollar industry. Students work in a variety of settings and can emphasize management, campus recreation, or outdoor pursuits. Non-majors may complete a 21 credit minor in Recreation Management.

Graduate Programs

Tim Passmore, EdD, CTRS/L—Associate Professor and Graduate Coordinator

Master of Science in Leisure Studies. Beyond the baccalaureate level, the program in leisure studies provides preparation at the master’s level across the discipline. Students develop a plan of study, under the advisement of a graduate committee and may focus on various emphasis areas in recreation, parks and leisure services or in recreational therapy. Graduates of the master's degree are typically employed in management and administrative positions in a wide variety of recreation, parks, and leisure service settings. Graduates with a master's degree with the focus on Recreational Therapy are typically employed in healthcare settings to include hospitals, physical rehabilitation facilities, behavioral health, facilities, long-term care facilities, and other facilities focused on healthcare. These include areas such as campus recreation, municipal parks and recreation, military recreation, YMCA's, state parks, and others. The master’s degree is 36 credit hours beyond the bachelor’s degree and many graduate assistantships are available for qualified students.

PhD in Health, Leisure and Human Performance, with an option in Leisure Studies. Students seeking the terminal degree in Leisure Studies engage in the PhD in HLP. Those completing this program are well prepared for entry-level positions as faculty members in a wide range of colleges and universities. To facilitate student readiness to work in academia, doctoral students work closely with faculty, engage in course work and examinations, and participate in opportunities for experiences in teaching, scholarship, and service. Core learning experiences include an understanding of curriculum, applied ethics, and administration as well as developing an understanding of the common tripartite mission of most universities - scholarship, teaching, and service. The PhD requires 60 hours of course work beyond the master's degree; many graduate assistantships are available for qualified students.

School of Teaching and Curriculum Leadership

Jennifer Sanders, PhD—Associate Professor and School Head

The School of Teaching and Curriculum Leadership prepares educational professionals to work with diverse populations in various settings. As a community of scholars, we generate knowledge, promote learning and understanding, and foster personal and professional growth through teaching, research, service, and outreach. Programs in the School of Teaching and Curriculum Leadership (STCL) include curriculum studies, elementary education, secondary education, literacy education, occupational/workforce education, science/mathematics education and special education. Consistent with the University's Professional Education unit conceptual framework, all programs leading to teaching certification at both initial and advanced levels incorporate the L.E.A.D.S. framework based on leadership, ethics and professionalism, academic and professional roles, diversity, and service orientation/community outreach. Graduate program goals in STCL focus on the concepts of agency, pedagogy, diversity, and research.

Course Prefixes. Most courses in STCL programs carry the CIED (Curriculum and Instruction) prefix. Other course prefixes include SPED (special education), OCED (occupational education), CTED (career and technical education) and SMED (Science/Mathematics Education).

Degree Opportunities. Degrees offered through STCL programs include Bachelor of Science (BS), Master of Arts in Teaching (MAT), Master of Science (MS), and Doctor of Philosophy (PhD).

Bachelor of Science degrees and options include:

Career and Technical Education (CTED)

Business and Information Technology Education

Health Occupations Education

Marketing Education

CTED (certification)

CTED (non-certification)

Technology Education

Elementary Education

Secondary Education

English Education

Foreign Language Education (PK-12)

Social Studies Education

Master of Arts in Teaching options for initial certification include:

Elementary Education

PK-12 Art

PK-12 Foreign Language

Secondary English

Secondary Mathematics

Secondary Science

Secondary Social Studies

Master of Science in Teaching, Learning, and Leadership (options and emphasis areas) include:

Curriculum and Leadership Studies

Elementary/Middle/Secondary/PK-12

Math and Science Education

Elementary Math Specialist

Occupational Education (OCED)

OCED Teaching

OCED Administration

OCED Pre-Engineering Education

Reading/Literacy

Special Education

Graduate Certificate Program:

College Teaching

Doctor of Philosophy in Education (options and emphasis areas); *Options housed in the School of Educational Studies

Curriculum Studies

College Teaching

*Educational Technology

Occupational Education

Professional Education Studies

Arts and Humanities

Literacy

Mathematics and Science Education

Special Education

*Social Foundations of Education

Undergraduate Programs

Jill Metger, M.S.—Clinical Instructor and Elementary Education Coordinator

Gayla Foster, PhD—Clinical Associate Professor and Secondary Education Coordinator

Mary Jo Self, EdD—Associate Professor and Career and Technical Education Program Coordinator

The School offers undergraduate degrees in elementary, secondary, and K-12 education, and career and technical education.

The Bachelor of Science in Elementary Education degree qualifies the student for an Oklahoma elementary teaching certificate (grades 1-8). The program is intended to prepare students with 1) a breadth of knowledge reflecting the broad traditions of general education, and 2) a depth of knowledge in the area of specialization. The degree includes four field experiences, culminating in a full-semester clinical internship, through which students work in varied school settings and demonstrate and strengthen their pedagogical knowledge. This degree is offered on both the Stillwater and Tulsa campuses, and Tulsa students have an opportunity to participate in the Urban Education Program, a cooperative effort between OSU and Tulsa Public Schools. Stillwater students can apply to the ExCEL program, providing site-based course work in one of two Stillwater elementary schools for the final two semesters of enrollment. The culminating clinical internship placement opportunities include placement through the Urban Education Program, placement in accredited schools in Stillwater and the surrounding area, or international placement. All students complete a Professional Portfolio with three separate submissions. It should be noted that all previous course work must be successfully completed prior to participation in the final two semesters. Oklahoma certification also mandates the Certification Examinations for Oklahoma Educators.

The Bachelor of Science in Secondary or K-12 Education degree is designed to prepare teacher candidates who are life-long learners, emerging professionals, and subject matter specialists with strong liberal arts backgrounds. Each secondary/K-12 degree and certification program includes general education courses, extensive specialization course work in the discipline area, and professional education courses accompanied by school-based field experiences. Tulsa area students have an opportunity to participate in the Urban Education Program, a cooperative effort between OSU and Tulsa Public Schools. Degree options leading to certification for teaching grades 6-12 are English, mathematics, science, and social studies. The foreign language option leads to certification in grades K-12. Secondary or K-12 certification (with degrees from the College of Arts and Sciences) are available in art, English, foreign language, and social studies. Students complete a Professional Portfolio with three separate submissions. Oklahoma certification also mandates the Certification Examinations for Oklahoma Educators. Teaching certification in secondary mathematics or science may be earned through the OSU Teach program, with degrees housed in the College of Arts and Sciences.

The Bachelor of Science in Career and Technical Education (CTED) is designed with two distinct options: the non-certification option, for students interested in adult technical education, and the certification option for students interested in secondary career and technical education.
CTED Non-certification Option. Students choosing the non-certification option are prepared to become instructional personnel for technical programs in community colleges, technical institutes and industry. Graduates with this option also accept technical employment of various types in business, industry and government.

The non-certification option is designed primarily for graduates of technical programs in technical institutes and community colleges. Qualified students from pre-professional programs can be accepted with advanced standing. In addition, students desiring to prepare for careers in technical education may enter the program directly from high school and complete their technical major requirements at OSU.

CTED Certification Option. Candidates selecting this option are prepared to serve as teachers, or in other related professional roles for career and technical education programs. Plans of study leading to the bachelor's degree are offered for those wishing to qualify for teaching under the approved state plan for career and technical education. Candidates completing this option are qualified to teach in career and technical departments of high schools and area career and technology centers.

The certification options include business information technology, marketing education, health occupations education, technology education, and technical and industrial education. The specializations in technical and industrial education are selected from but not limited to the trade and industrial fields of air conditioning heating and refrigeration, automotive technology, aviation technology, building and grounds maintenance, carpentry, commercial art, commercial photography, computer repair technology, cosmetology, engine technology, drafting, electronics, laboratory technology, law enforcement training, machining, masonry, printing, plumbing, telecommunications, and welding technology. Technical and industrial option, the specific field is determined by the specialization proficiency and teaching aspirations of the student. Since specialization competency normally is required for admission, students are accepted into this option by consent of the program faculty. The required specialization competency may be acquired by completing a career and technology program in an approved high school, area vocational school, technical college, community junior college, by apprenticeship training, by actual experience in the field of specialization, or by a combination of these. See the section "Professional Education Unit" for details regarding state certification requirements and procedures.

Graduate Programs

The School offers graduate degree programs at the master's and doctoral levels. While specialization is required, maximum program flexibility enables students to meet individual goals. Programs are designed to prepare persons to enter public or private elementary and secondary schools as teachers, curriculum directors, department heads, reading specialists and instructional leaders or enter other educational institutions and community agencies as educational leaders. Doctoral programs provide preparation for university teaching and research, as well as for P-12 roles, such as curriculum administrators.

Programs in the School offer the Master of Science (MS) in Teaching, Learning, and Leadership, Master of Arts in Teaching (MAT), a Graduate Certificate in College Teaching, and a Doctor of Philosophy (PhD) in Education.

Master of Science in Teaching, Learning and Leadership (TLL)

A student may earn the degree of Master of Science (MS) in Teaching, Learning, and Leadership. Students specialize in several areas highlighted below as TLL options. All options include at least one research course. Students planning an emphasis in K-12, secondary education, or math/science education may incorporate graduate course work from an academic discipline. The master's degree program is also frequently designed to qualify graduates for certification in a specific area.

The Curriculum and Leadership Studies option provides a sound foundation in curriculum knowledge including the social, philosophical, ethical, political, historical, and psychological aspects of curriculum, curriculum planning, pedagogy, and curriculum leadership. The degree program will deepen one's knowledge in curriculum. Students will prepare for positions as program administrators, curriculum planners, curriculum consultants, teacher leaders, and teacher researchers. Program content will benefit those teachers pursuing National Board Certification. Many classes are offered on both Stillwater and Tulsa campuses.

The Elementary, Middle, Secondary, or K-12 option (EMSK12) provides choices for students to include course work to enhance their understanding of teaching and learning at their chosen level, and in the case of secondary or K-12 to include content area course work. This option also includes a plan designed for students seeking initial certification in elementary education (pre-K-8) and high school (grades 7-12). This initial certification plan includes a semester-long clinical internship in the schools, preparation of a professional portfolio as required by the state, and mandated Teacher Certification Examinations.

The Math/Science Education option provides extended course work in both content area and education and additional math or science courses through the College of Arts and Sciences. The option also includes course work integrating math and science pedagogy so that graduates will be skilled in content integration between the two areas. The option is designed to prepare teacher leaders in math education and/or science education. This option asks applicants to either hold an undergraduate major or minor in mathematics or science or post a satisfactory score on the quantitative portion of the Graduate Record Exam.

The Occupational Education Studies option is flexible in content coverage, offering course work appropriate for a wide range of people, including Career Tech educators, technical educators, and other personnel in higher education, career and occupational counselors, adult trainers in business and industry, and workforce development personnel from all fields. Courses are offered using a variety of delivery options, including evening face-to-face classes, two-way video broadcast, online, and weekends. Many classes are offered on both the Stillwater and Tulsa campuses.

The Reading and Literacy option provides students with experiences to develop a conceptually coherent doctoral program in which students and faculty explore how these processes are embedded in wider social, political and economic contexts, and envision the possibilities for improving teaching and learning. To this end, the program has an emphasis on the critical production of knowledge with the intent that graduates from this program will contribute to their scholarly fields while addressing the needs of the state of Oklahoma, the country and the larger global community. The integration of five degree options—Curriculum Studies, Educational Technology, Occupational Education Studies, Professional Educational Studies, and Social, Career, and Educational Research—provides a conceptually coherent doctoral program in which students and faculty explore teaching and learning in new ways within various cultural milieus, such as...
as the family, occupations, public schools, and universities. The Ph.D. degree, with options housed in two Schools within the College of Education, is intended for individuals seeking employment in higher education, common schools, and other educational settings (such as museums, educational publishing, and curricular development).

The Curriculum Studies option has as its mission to educate scholars with a deep understanding and ability to create and use knowledge of curriculum studies in the field of education and in other scholarly communities interested in the advancement of education at the state, national, and international levels. In articulating the field of curriculum studies, it is important to acknowledge the broadest views of curriculum, including content and organization of school, the social context in which school is situated, and the process of education both in and out of school. Curriculum studies is understood as both a disciplinary and an interdisciplinary study with its own distinctive history, conceptions, and modes of inquiry, always open to new scholarship. Curriculum theorizing, curriculum development and assessment, pedagogy, curriculum inquiry, curriculum history, leadership and advocacy, critical media literacy, teacher research, and intercultural and international dialogue are all part of the scholarship of curriculum studies in the program. Particular attention is also devoted to those absent from typical curriculum decision making; curriculum studies is concerned with issues of equity, access, and voice. This option is housed in the School of Teaching and Curriculum Leadership.

The Educational Technology option is designed to facilitate educators in becoming highly qualified educational technologists and school library media specialists. Our focus on instructional design, information management, and multimedia design and development along with core technology integration enables candidates to choose either P-12 school or higher education settings in effective and fulfilling ways. This option is housed in the School of Educational Studies.

The Occupational Education Studies option is intended to strengthen research activities for improving practice in occupational education, provide graduate programs that reflect transformative roles in occupational education and the workplace, strengthen leadership and outreach services to the discipline, expand activities in international workforce development, and strengthen the cultural diversity in the field of occupational education studies. The focus is to prepare persons for leadership positions in higher education, international occupational education and workforce development organizations; national, state, and community agencies; as well as public and private educational institutions. This option is housed in the School of Teaching and Curriculum Leadership.

The Professional Education Studies option includes areas of specialization in Arts and Humanities (arts, English, FLL, foreign language, and the social studies/sciences), Literacy, Mathematics and Science, and Special Education. Professional Education faculty members work to make scholars of educational theory and research who advance knowledge fundamental to teaching and learning in a diverse and global society and fundamental to social justice and equity in education. Diverse perspectives include but are not limited to in-depth study of theories used to advance social justice and equity in education, teaching, and learning; analyses of diverse teaching and learning contexts; application of inquiry-based teaching-learning theory; use of research methodologies (qualitative, quantitative, mixed methods, and conceptual/theoretical methodologies) for studies in education; and conceptualization and reconceptualization of the meaning and value of social justice and equity in education, teaching, learning, and teaching-learning contexts. This option is housed in the School of Teaching and Curriculum Leadership.

The Social Foundations option is intended to prepare future scholars and educators to employ a number of different disciplinary perspectives to analyze critically and evaluate policies and practices within and outside education to understand better how such policies and practices shape educational institutions. This approach is intended to heighten students’ abilities to examine, understand, and explain educational arrangements, processes, and practices to develop a disciplined sense of policy-oriented educational responsibility. Scholars in social foundations are expected to contribute to advancing the educational enterprise at national and international levels. This option is housed in the School of Educational Studies.

General Program Requirements, Application Procedures and Financial Aid

Master's Program. TLL master’s degree options require a minimum of 36 hours of course work. Students take a comprehensive exam and complete either a Creative Component or a Thesis. The Creative Component may take a variety of forms from an advanced paper to a creative demonstration of expertise gained through the degree. The thesis is original research. The student’s Advisory Committee (three members) assists the student through all aspects of the program. Applicants to the Graduate College provides program decisions. For unqualified admission an applicant must have completed an undergraduate degree in Education or a related field and must submit a curriculum vita and goals statement aligned with the option area chosen. Option areas have minimum of point requirements for the undergraduate degree and may have additional materials that make up the admissions packet.

Doctoral Program. The Doctor of Philosophy (PhD) degree requires a minimum of 69 semester hours beyond the master’s degree. Application to the Graduate College precedes program admission decisions. For program admission, candidates submit scores from the Graduate Record Exam or the Miller Analogies Test, a Statement of Goals and Objectives, references, and examples of written expression. An interview may be required.

Financial Aid. Some support is available each year for research assistantships and for qualified graduate students to assume teaching responsibilities in the undergraduate curriculum. Interested persons are encouraged to apply at any time. Applications can be obtained from the School of Teaching and Curriculum Leadership.

School of Educational Studies

The School of Educational Studies offers degrees or options in the following areas: aviation and space, school administration, college student development, research and evaluation, curriculum social foundations and educational technology. These areas of emphasis conduct scholarly inquiry and educate professionals in areas foundational to thought and practice in a wide variety of professional roles associated with business, educational and industrial settings. Consistent with the goals of OSU’s Professional Education Council’s Core Concepts and Goals Statement, faculty strives to demonstrate and perpetuate teaching that is based on theory and research-driven educational practices.

We provide specialized training at the undergraduate and graduate levels yet permit flexibility to enable students to meet individualized goals. General information about undergraduate degrees may be found under the “University Academic Regulations” section of the Catalog. Additional general information about graduate degrees may be found in the “Master's Degree,” “Doctor of Education,” or “Doctor of Philosophy” areas of the “Graduate College” section of the Catalog.

Financial support is available for research assistantships and for qualified graduate students to assume teaching responsibilities under faculty supervision. Selections for assistantships are usually made in the spring semester for the following academic year. However, interested individuals are encouraged to apply at any time. Applications can be obtained from the School.

Aviation and Space Education

Steve Marks, EdD—Professor and Undergraduate Program Coordinator

Timm Bliss, EdD—Professor and Graduate Program Coordinator

Aviation and Space Program. The Aviation and Space Program prepares students for careers in the aerospace industry. The BS in Aerospace Administration and Operations degree program offers five options: Professional Pilot, Aviation Management, Technical Services Management, Aerospace Security, and Aerospace Logistics.

The Professional Pilot option prepares students for careers in flight operations in both the general aviation and the air carrier segments of the aviation industry. In addition to high quality aviation related coursework, the student will attain FAA certifications for Private Pilot, Commercial Pilot-Instrument Rated for both single-engine and multi-engine aircraft and Certified Flight Instructor.

The Professional Pilot option is compliant with Title 14 CFR of the Code of Federal Regulations Part 141 and accredited by Aviation Accreditation Board International (AABI).

The Aviation Management option prepares students for management positions in the aerospace industry. Employment opportunities include positions with fixed-base operators, air carriers, corporate flight departments, commuter and air taxi operations and a variety of career areas associated with airport operations, manufacturing, maintenance and government aviation and aerospace organizations. The Aviation Management option is accredited by Aviation Accreditation Board International (AABI).

The Technical Services Management option builds on an individual’s technical experience in aircraft maintenance or avionics to prepare the students for management positions in all segments of the industry. Twenty-five hours of technical training may be credited toward this option if received from an accredited institution.

The Aerospace Security option prepares students for careers in aerospace security fields. Employment opportunities include governmental agencies and private industry that deal with aerospace security operations.

The Aerospace Logistics option prepares students to work in the aerospace logistics sector. Employment opportunities include positions with military and civilian contractors. The program can be completed online. Facilities worldwide as well as any aerospace organization involved in supply-chain management activities.

The Aviation and Space Program has an extensive industry-based management internship program established with aerospace industries, major and regional air carriers and a variety of other companies within the aerospace industry. OSU is an educator member of the Aviation Accreditation Board International (AABI).

The AVED Program is also an institutional member of University Aviation Association (UAA).
Graduate Degree Requirements

Aerospace Security Certificate. The Aerospace Security Certificate prepares students for careers in aerospace security fields. Employment opportunities include governmental agencies and private industry that deals with aerospace security operations. To be considered for admission to the Aerospace Security Graduate Certificate students must be admitted to both the OSU graduate college and the AVED program. Students who want to pursue their AVED Master’s must also make application to the AVED Master’s degree.

MS Degree Program. The Master of Science in the Aviation and Space degree emphasizes aviation/aerospace management and leadership, legal and regulatory issues, aviation finance and economics, labor relations in aviation/aerospace, issues in the aerospace industry, and additional content regarding the aviation/aerospace industry and related government programs and missions. Students participating in this program come from a variety of academic and/or professional backgrounds including aviation, military, and government. The scope of this degree program is designed to meet the practical application of research.

3. Provide leadership, expertise, and professional development opportunities addressed to the master’s program, students must be admitted to both the OSU graduate college and the AVED program. Applicants are required to provide a statement of personal goals and objectives, two letters of recommendation addressing the applicant’s abilities, interest, motivation, etc., and a copy of a current resume. All MS students must complete course work from research, core requirements, program emphasis, and elective courses to total 33 hours. At least 21 hours must be completed at the graduate level (5000 and above) and no pass/fail courses may be used. Master’s students must also complete a Creative Component for committee approval.

EdD Degree Program. The Doctor of Education (EdD) in Applied Educational Studies with the Aviation and Space Education emphasizes aviation leadership and expertise, administration, and leadership in aviation institutions of higher education, air carrier industry, international aviation issues, and applied aviation and space research. The Space portion emphasizes the development of air and space flight; the earth’s air, land and water systems; and the solar systems to include the sun, planets, and probes. Aviation and Space Program seeks doctoral candidates with strong intellects, proper educational preparation, breadth and depth of Aviation and Space experiences and the capacity for disciplined investigations. The Aviation and Space program provides advanced courses in the specific field of aviation and space for successful practice in the aerospace industry. Applicants should have at least three full years of work experience in the aerospace industry, government, and/or higher education area(s). Either the MAT or GRE test must be taken within five years prior to application to the program. All applicants are required to submit a statement of personal goals and objectives, two letters of recommendation addressing the applicant’s experiences, abilities, interest, motivation, etc., and a current resume/vita. Course work must be completed from the professional core, program emphasis, field experiences, and research in addition to 10 hours of Doctoral Dissertation, for a total of 60 hours of course work beyond the Master’s degree. The EdD degree requires a dissertation that is research-based in the field of specialization of the practitioner-student. Basic principles are used to emphasize the practical applications of research.

The mission of the Aviation and Space program has three essential components:

1. Cultivate exemplary undergraduate and graduate instruction through a professional atmosphere in which students learn, develop, promote integrity, and contribute to the broader aerospace community.

2. Engage in applied aerospace research and scholarly initiatives that benefit industry, general aviation, government, and the public.

3. Provide leadership, expertise, and professional development opportunities for aviation and aerospace professionals and the aerospace industry, and to promote a greater understanding of aerospace among the general public.

OSU NASA Education Projects. The faculty in the Aviation and Space Program are the principal investigators for the NASA education.

The JSC SEA provides opportunities for educators and students from Texas and across the nation to directly engage with NASA missions and research. OSU in partnership with Texas A&M University, encourages students to consider careers in science, technology, engineering, and mathematics (STEM) by implementing various educational projects that utilize NASA’s unique capabilities, facilities and expertise including the Pre-Service Teacher Institute, Middle School Aerospace Scholars, High School Aerospace Scholars, Community College Aerospace Scholars, National Community College Aerospace Scholars, and the Reduced Gravity Educational Flight Projects.

Additional information can be found at the FLYOSU.okstate.edu website.

Educational Leadership

Katherine Curry, PhD—Assistant Professor and Program Coordinator (School Administration)

Educational leadership emphasizes three areas: School Administration, Higher Education and College Student Development. The PhD in Educational Leadership and Policy Studies is offered for individuals who aspire to leadership positions in all levels in post-secondary institutions; and College Student Development (a 42-hour program that prepares individuals for positions of leadership in day-to-day delivery of student services). Admissions to the graduate programs in Educational Leadership are competitive and based on multiple factors.

Three degrees are offered with a specialization in School Administration:

• M.S. in Educational Leadership with a specialization in School Administration: To be considered for admission to the M.S. program in School Administration, applicants are expected to have an earned baccalaureate degree with at least a 3.00 GPA (on a 4.00 scale), and career goals that match the program. Applicants must provide appropriate recommendations (3), the required essays, and a recent Miller Analogies Test (MAT) or Graduate Record Exam (GRE) score. Students currently enrolled in the program have an average MAT score of 57/410 or GRE scores of Verbal 149 (437) and Quantitative 145 (541). Applicants may be asked to complete an interview with program faculty. Applications for the M.S. in School Administration are accepted on a rolling basis; an applicant’s file will be reviewed when all materials have been received and notification of the admission decision will follow shortly thereafter.

• Ed.D. in Educational Leadership with a specialization in School Administration: To be considered for admission to the Ed.D. program in School Administration, applicants must possess an earned master’s degree with a minimum 3.00 GPA (on a 4.00 scale) and career goals consistent with SA program goals. The online application must include a career objectives statement, a current vita or resume, a description of relevant work experiences, samples of scholarly work, a critical issues essay, three letters of recommendation, and a recent MAT or GRE score. Students recently admitted to the Ed.D. program have an average MAT score of 422 or GRE scores of Verbal 157 (560) and Quantitative 150 (530). Review of applications for doctoral programs will begin after March 15, the deadline for submission of all application materials; all materials must be received by the COE Graduate Studies office on or before the application deadline. Notification of decisions will follow soon thereafter.

• Ph.D. in Educational Leadership and Policy Studies/Educational Administration: Applicants for Ph.D. program in Educational Administration must provide a current academic vita/resume, a career objective essay, a critical issue essay, two examples of written work, three sets of recommendation, and GRE (Graduate Record Exam) scores. The expected minimum scores are Verbal - 153, Quantitative - 149, and Writing - 4.5 for exams taken on or after Aug. 1, 2011. For exams taken prior to Aug. 1, 2011, expected minimum scores are Verbal - 500, Quantitative - 515, and Writing - 4.5. GRE scores must not be over five years old at the time of application review. Additionally, program faculty may request an interview with the applicant. The Ph.D. requires a one year residency of at least nine hours for two semesters during coursework completion. Review of applications for doctoral programs will begin after March 15, the deadline for submission of all application materials; all materials must be received by the COE Graduate Studies office on or before the application deadline. Notification of decisions will follow soon thereafter.

Three degrees are offered with a specialization in Higher Education and Student Affairs:

Higher Education and Student Affairs

Stephen P. Wanger, PhD – Associate Professor and Program Coordinator

• M.S. in Educational Leadership with a specialization in Higher Education. To be considered for admission to masters program with a specialization in Higher Education, applicants are expected to have an earned baccalaureate degree with at least 3.00 GPA (on a 4.00 scale) and career goals that match program learning objectives. Through the OSU Graduate College’s online application, applicants must provide a career objective essay, current academic vita or resume, critical issue essay, appropriate recommendations, recent Graduate Record Exam (GRE) scores or Miller Analogies Test (MAT) scores. Students currently enrolled in the program have an average MAT score of 57/410 or GRE scores of Verbal 149 (437) and Quantitative 145 (541). Applicants may be asked to complete an interview with program faculty. Applications to all HESA master’s programs are accepted on a rolling basis; however, for fullest consideration for graduate assistantships in the
College Student Development program, please submit all materials by January 15. An applicant’s file will be reviewed when all materials have been uploaded to the online application system. Notification of the admission decision will follow before the beginning of the next semester.

- Ph.D. in Educational Leadership and Policy Studies with a specialization in Higher Education: Through the OSU Graduate college’s online application, applicants for the Ph.D. program in Higher Education must provide a current academic vita/resume, a career objective essay, three letters of recommendation, a critical issue essay, two examples of written work, and GRE (Graduate Record Exam) scores. Students currently enrolled in the program have an average GRE score of Verbal - 153, Quantitative - 149, and Writing - 4.5 for exams taken on or after Aug. 1, 2011. For exams taken prior to Aug. 1, 2011, expected minimum scores are Verbal - 500, Quantitative - 610, and Writing - 4.5. GRE scores must not be over five years old at the time of application review. Additionally, the program faculty may request a portfolio or previous work with the applicant. The Ph.D. requires a one year research experience completed simultaneously with late-stage coursework. All application materials must be received by March 15; review of applications will begin soon after. Notification of decisions will follow soon thereafter.

More information about the Higher Education Administration program, course requirements, other pertinent information, and an electronic copy of the application packet, can be found at http://hied.okstate.edu.

One degree is offered with a specialization in College Student Development:

Applications for all degree programs can be found on the COE Graduate Studies website at http://education.okstate.edu/graduate-studies.

### Educational Technology

Samantha Stansberry, EdD—Associate Professor and Coordinator

The goal of the Educational Technology program is to facilitate candidates educators in becoming highly qualified educational technologists and school library media specialists. Our focus is on instructional design, information management, and multimedia design and development along with core technology integration enables candidates to serve in a variety of settings in education, business, and industry. The program website, edtech.okstate.edu, offers more detail.

The MS in Educational Technology is for students interested in furthering their knowledge, skills, and opportunities in the area of educational technology and school library media. This degree will enhance their marketability and, in the case of the School Library Media option, provide credentials necessary for recommendation for this particular area of teacher certification. In addition to the core focus on educational technology, candidates pursuing School Library Media certification will also be immersed in the areas of information literacy, curriculum leadership, and program administration, meeting ALA accreditation standards through CAEP.

Applications are reviewed as they are received.

### Admission Requirements

For both the masters and PhD programs, admissions decisions are competitive and based on a combination of multiple criteria. Criteria for admission to the master’s program include an undergraduate GPA of at least 2.75; Miller Analog Test (MAT) or Graduate Record Exam (GRE); 3 positive letters of reference (preferably from previous instructors or employers); and evidence of potential for professional development (e.g., proof of written work). For the doctoral program, admissions criteria include telephone or personal interview, GRE scores, undergraduate and master’s GPA, four positive letters of reference on SES forms, relevant experience, statement of career goals, and evidence of potential for professional development (e.g., proof of written work). Students considering admission to the doctoral program must have an earned baccalaureate degree and evidence of professional specialization.

Doctoral applicants should have an undergraduate GPA of at least 3.50 and a cumulative GPA of at least 3.50.

### Application Procedures

Applicants must submit a Graduate Application for Admission form, the required number of positive letters of recommendation (three for master’s, four for doctoral), two official transcripts from each institution attended, Statement of Purpose, and the Graduate College application fee. International applicants must include TOEFL scores and a signed Confirmation of Resources form. Completed applications are reviewed as they are received.

### Social Foundations

Guoping Zhao, PhD—Professor and Coordinator

Social foundations of education is the interdisciplinary study of schooling and other forms of education. Ever since it began during the 1930s at Teachers College, Columbia University foundations have been a focal point for social justice advocates who situate education in historical, philosophical, economic, and social contexts. Using the tools of the humanities and the social sciences, social foundations scholars ask perennial questions, such as: What is the purpose of schooling in a democracy? What knowledge and values should be taught and to whose benefit? How are issues of race, ethnicity, social class, gender and ability manifested in schools?

Drawing from history, philosophy, sociology, anthropology, international studies, and other disciplines to teach their courses, faculty in the social foundations program seek critically to analyze social dynamics in educational settings and how policy and practices might be improved. Students from other human service professions and other disciplines are invited to make similar use of the content of these courses for their own professional practice.

### Doctoral Program

The mission of the PhD in education with social foundations option is to educate scholars who have the abilities to discover, integrate, and apply knowledge about the culture in which the institutions called school reside.
as well as the culture the institution creates. In the broadest sense, social foundations option is intended to educate scholars so they can disseminate new knowledge to educational, government, social economic, and other scholarly communities interested in the advancement of the educational enterprise at the national and international levels.

To be considered for admission to the PhD program, applicants are expected to have an earned master's degree with minimum GPA averages of 3.50 on a 4.00 scale, and have career goals that match the program. Applicants must provide appropriate recommendations (three), present either a Graduate Record Exam (GRE) or Miller Analog Test (MAT) score. Preferred GRE scores are: Verbal-151, Quantitative-150, and Analytic Writing-4.5. For the MAT, a raw score of 400 is expected. A recent scholarly writing sample is also expected. For students with little or no background in social foundations, additional leveling courses may be required.

Professional Education Unit
Officers of the Professional Education Council
John Romans, PhD—Dean and Director of Professional Education
Susan Stansberry, EdD—Associate Director of Professional Education

The College of Education coordinates all professional education programs offered at Oklahoma State University. All programs are operated in collaboration with the colleges of Agricultural Sciences and Natural Resources, Arts and Sciences, Human Sciences and the Graduate College. The Dean of the College of Education serves as the Director of the Professional Education Unit (PEU). The Professional Education Council has been established as the governance and oversight structure for the Professional Education Unit. The Unit has a mission statement, goals and a strategic plan that guide the operation of its programs.

Professional Education Unit Core Values. The College of Education articulates through its conceptual framework that guides the direction of programs, teaching programs, candidate performance, faculty scholarship, and service. The core values of the conceptual framework emphasize leadership, ethics and professionalism, academics and professional roles, diversity, and service orientation/community outreach. (L.E.A.D.S.)

Leadership. PEU prepares candidates who are committed to the belief that professional educators who provide quality education are the foundation of a prosperous and democratic society.

Ethics and Professionalism. PEU prepares candidates who demonstrate ethical and professional behavior in their interactions with students, families, colleagues and communities and practice social justice.

Academic and Professional Roles. PEU provides opportunities to prepare knowledgeable candidates who reflect upon the connections between academics and their professional roles.

Diversity. PEU prepares candidates who believe everyone deserves the opportunity to learn and can learn; they possess knowledge, skills, and dispositions to serve as effective professionals who understand and meet the needs of a diverse society.

Service Orientation/Community Outreach. PEU prepares candidates who value and engage in service and meaningful involvement of the learner/client and their families, as well as their school and their community.

All Professional Education programs are administered by the Dean of the College of Education and are coordinated through the Office of Professional Education. Upon completion of an approved program or degree, passing the appropriate Certification Examinations for Oklahoma Educators (CEOE) and the recommendation of the University, the candidate will be eligible for certification to serve in Oklahoma schools. All candidates completing an approved program or applying for an initial or advanced certificate are subject to all rules and regulations specified by the OSU Professional Education Unit, the Oklahoma State Board of Education, and the Office of Educational Quality and Accountability (OEGA). State-mandated changes in teacher certification may result in additional requirements for certification.

Certification programs are offered at various levels in the College of Education as well as in the Colleges of Agricultural Sciences and Natural Resources, Arts and Sciences, and Human Sciences, but all require earning at least a bachelor’s degree for recommendation from PEU. Candidates must meet all of the following criteria to be fully admitted to Professional Education:

1. Basic Skills Competency.
2. Orientation to Professional Education Course and Field Experiences. An appropriate orientation to Professional Education course and field experiences must be completed with a grade of "C" or better. One semester credit hour of early field experiences must be completed with a grade of "C" or better. The following courses must be completed:
   a. Field Experience in Elementary Education, 2 credit hours
   b. Field Experience in Middle/Secondary Education, 2 credit hours
   c. Field Experience in Special Education, 2 credit hours

3. Preferred GRE scores are: Verbal-151, Quantitative-150, and Analytic Writing-4.5. For the MAT, a raw score of 400 is expected. A recent scholarly writing sample is also expected. For students with little or no background in social foundations, additional leveling courses may be required.

4. To be considered for admission to the PhD program, applicants are expected to have an earned master's degree with minimum GPA averages of 3.50 on a 4.00 scale, and have career goals that match the program. Applicants must provide appropriate recommendations (three), present either a Graduate Record Exam (GRE) or Miller Analog Test (MAT) score. Preferred GRE scores are: Verbal-151, Quantitative-150, and Analytic Writing-4.5. For the MAT, a raw score of 400 is expected.

5. Professional Education programs at Oklahoma State University should be addressed to the head of the School or Department offering the program or the Office of Professional Education, 325 Willard.

There are increasing opportunities in business, industry, and state and federal agencies for persons with unique preparation in several education specialties. The Unit also provides academic preparation for a wide range of certification and teaching areas:

Undergraduate Teaching Certification Programs
Elementary Level (PK-8) Programs:
- Elementary Education (PK-3)
- Elementary Education (1-8)
- Elementary/Secondary Level (PK-12) Programs
- Art Education
- Foreign Language (French, German, Spanish)
- Music-Instrumental
- Music-Vocal
- Physical Education/Health/Safety

Secondary Level Programs
- Agriculture Education
- Secondary English
- Secondary Mathematics
- Secondary Science
- Secondary Social Studies
- Career and Technical Education
- Family and Consumer Sciences

Advanced Level Certification Programs
- Math Specialist
  - Principal (Elementary/Middle/Secondary) - Standard
  - Reading Specialist
  - School Counselor
  - School Library Media Specialist
  - School Psychologist
- Special Education (Mild-Moderate Disabilities) – MS degree for those who already hold initial certification in another area
- Speech/Language Pathologist
- Superintendent
- Non-Traditional Certification Paths
  - Elementary Education (1-8) Initial Certification at the MS level
  - Secondary Education (6-12) Initial Certification at the MS level
  - Special Education (Mild-Moderate Disabilities) – Special Education Teacher Certification (Grades P-12)
- Special Education Paths
  - 4+1 Bachelors/Masters (Mild-Moderate Disabilities)

Professional Education Dispositions
Following is a list of professional dispositions all pre-service teachers should exhibit in coursework, field experiences, and student teaching: ethics, professionalism, commitment to education, respect for diversity, work ethic, communication, learner attributes, cooperative/collaborative nature, and flexibility (further description and assessment tool available on the Professional Education website). Faculty of Professional Education and specialization courses will assess candidates throughout the program. Candidates evaluated below target on dispositional assessments will be offered remediation and their placement in PEU field experiences/practical care will not be guaranteed.

Admission to Professional Education
The criteria for admission to Professional Education programs are based on University-wide policies recommended by the Director of Professional Education through the Professional Education Council. Requirements are applicable to all Professional Education administrative units of the colleges preparing educators. Students should submit an Application for Admission to Professional Education form to the Professional Education Unit as early as possible in their program. The candidate is not considered a fully eligible participant in a Professional Education Program until formally admitted to the Professional Education Unit.

Full admission is required to enroll in the restricted courses in teaching methods and the clinical practice internship.

Criteria for Admission to Undergraduate Professional Education Programs
The student must meet all of the following criteria to be fully admitted to Professional Education:

1. Orientation to Professional Education Course and Field Experiences. An appropriate orientation to Professional Education course must be completed with a grade of "C" or better. One semester credit hour of early field experiences must be completed with a grade of "C" or better. The following courses must be completed:
   a. Field Experience in Elementary Education, 2 credit hours
   b. Field Experience in Middle/Secondary Education, 2 credit hours
   c. Field Experience in Special Education, 2 credit hours

2. Basic Skills Competency. Basic skills competency must be demonstrated by successful completion of the Oklahoma General Education Test (OGET).

3. Minimum cumulative overall GPA of 2.50. (2.75 for Elementary Education)

The minimum cumulative overall GPA must be earned based on no fewer than 40 credit hours of courses to include lower-division general education requirements as specified in the student's program.
Criteria for Admission to Graduate (post-baccalaureate)

Professional Education Programs

Graduate (post-baccalaureate) students must complete the Application for Admission to Professional Education form. Post-baccalaureate candidates must meet one of the following criteria for full admission to Professional Education:

1. The student must have completed an approved Professional Education program and hold a valid Oklahoma certificate or Provisional, Standard, or Professional Certificate, or a valid certificate from a state with which the Oklahoma State Department of Education has an interstate contract. The certificate or Provisional, Standard, or Professional Certificate must have included successful completion of (a) one semester credit hour of early field experiences with a grade of "C" or better or a grade of "P" and (b) an orientation to professional education course with a grade of "C" or better or a grade of "P." If the graduate student does not hold a valid credential and did not successfully complete the criteria listed above, he or she must meet 2 or 3.

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 cumulative overall GPA of at least 2.50 (2.75 for Elementary Education); (c) complete one semester credit hour of early field experiences with a grade of "C" or better or a grade of "P"; and (d) complete an orientation to Professional Education course with a grade of "C" or better or a grade of "P" and receive a passing score on the OGET.

3. Students classified by the Graduate College as "special" or "provisionally admitted" must (a) have a minimum cumulative overall GPA of at least 2.50 (2.75 for Elementary Education); and (b) complete one semester credit hour of early field experiences and an orientation to Professional Education course with a grade of "C" or better or a grade of "P" and receive a passing score on the OGET.

Professional Portfolio

Oklahoma state statutes require candidates for certification through an accredited Educator Preparation Program (EPP) in Oklahoma to present professional portfolios as a portion of their professional documentation. Candidates in Professional Education are required to submit a professional portfolio for review and approval at designated checkpoints prior to certification. Details of the portfolio are available in the Professional Education Student Handbook (http://education.okstate.edu/peu).

Transfer Students

Transfer students must work toward the criteria for full admission to Professional Education established by Oklahoma State University as soon as possible during the first semester at OSU. It may be possible to transfer admission from another Oklahoma institution. For information see the OSU site http://education.okstate.edu/peu or contact the Office of Professional Education.

Calculating Grade-Point Average Professional Education

The required GPA for all Professional Education purposes is calculated based on the University graduation and retension GPA policy.

Retention in Professional Education

For participation in all courses requiring full admission to and for continued acceptability in the Professional Education unit, an undergraduate candidate must maintain a grade-point average required for graduation of at least 2.50/2.75. If this GPA falls below 2.50/2.75, the candidate is placed on probation. When the required graduation GPA is raised above 2.50/2.75, the candidate is removed from probation. If the candidate fails to meet the graduation GPA requirement in that probationary semester or fails to have at least a 2.50/2.75 GPA for that semester, the candidate will be suspended from the Professional Education Unit. A candidate not satisfying the probation requirements at the end of the semester following the initial probationary semester will be administratively withdrawn from the Professional Education Unit and all courses having full admission as a prerequisite. Readmission to the Professional Education Unit will require a new application. Advisers are available to assist the candidate in regularly reviewing continuing retention or reinstatement in Professional Education programs. A retention review prior to enrollment and again prior to the beginning of classes each semester is encouraged when continuing retention is in question.

Graduate students, including those classified as graduate special students, admitted to the Professional Education Unit must meet and maintain the requirements of the Graduate College to remain in good academic standing. This will require that graduate candidates earn and maintain a 3.00 GPA at the Oklahoma State University following admission to Professional Education.

Foreign Language Proficiency

Candidates in Professional Education programs may be required to document competency in a foreign language at the novice high level.

Program Completers

In Oklahoma, a program completer is defined as a person who has met all the requirements of an accredited educator preparation program. Program completers include all those who are documented as having met such requirements. OSU requirements include a degree, program credentials as documented on a transcript and written proof of having met the program requirements which include successful completion of all certification examinations and a professional portfolio. The certification check sheets available at http://education.okstate.edu/peu/certification detail requirements for each certification area.

Background Check for Field Placements

In alignment with Oklahoma state statutes and administrative code (OS §70-6-190, OS §70-3-104, OAC 210:20-9-98), the Oklahoma State University (OSU) Professional Education Unit (PEU) requires a state level background check (name check) on ALL non-certified candidates prior to placement in any field experience or clinical practice. The candidate is responsible for associated fees, which may vary depending on in-state or out-of-state student status. The PEU may request an updated background check as needed. While we make every effort to place candidates in the best possible field experience or clinical practice situation, school districts do review background checks and past criminal history in terms of their own policies and may decline hosting a particular candidate for field experience or clinical practice. (In most cases this would be an Oklahoma check, however, in the case of an out-of-state transfer student it could be a check from their originating state.) This process if facilitated by the Office of Professional Education (325 Willard).

Diverse Placement in Field Experiences

Since OSU is a land-grant institution, we are particularly proud of partnering with Oklahoma public schools. Candidates will be placed in diverse school settings: a variety of socio-economic settings—such as rural, suburban, or urban schools—and experiences with diverse groups of students. Previous clinical/field experiences will be considered when determining the internship placement. See the Professional Education Diversity Statement for clarification: http://education.okstate.edu/peu/diversity.

Data on all field experience and clinical practice placements is maintained by the Professional Education Unit and Assessment Specialist. Initial and Advanced certification programs work directly with the Coordinator of Field Experiences and Clinical Practice to best serve candidates and our partnering school districts with research-based experiences. Placements are based on the following criteria:

1. OSU must have a contractual agreement with the participating school district,
2. the principal and the Mentor Teacher/Educator must be in agreement about the placement,
3. the Mentor Teacher/Educator must meet established criteria to work with a candidate,
4. a qualified OSU Supervisor must be available for travel to that site.
5. program faculty recommendation for clinical practice (based on academics, field experiences, and dispositions)

Clinical Practice Requirements

In order to participate in clinical practice, all teacher candidates must complete the Clinical Practice Internship Application during the prior semester. Clinical practice information is distributed at the "Intent to student teach" meeting each semester. Candidates are notified of this meeting through consultation with advisers, by e-mail notifications, via the PEU website the Teacher Certification @ OSU, and by announcements made in Professional Education classes. Candidates must submit their on-line applications to the Office of Professional Education prior to specified dates in September and February. For placement in Spring semester clinical practice, the Intent to Student Teach meeting is held the first Wednesday after Labor Day at 5pm, and for placement in Fall semester clinical practice the meeting is the first Wednesday in February at 5pm. Candidates will be notified by e-mail of their placements after the Coordinator of Field Experiences has received confirmation from the cooperating schools.

Candidates should not meet with teachers or principals in an attempt to establish their own placement. The following guidelines should be considered when listing your placement preferences in the space provided on the application:

• Public Schools: All internships occur in public schools.
• Placement in Diverse and Geographic Settings: Candidates will be placed in school settings in a variety of socio-economic settings—such as rural, suburban, or urban schools—and experiences with a diverse group of students. Previous clinical/field experiences will be considered when determining the internship placement.
• Professional Experiences: Candidates will be placed in a location where professional experiences can develop. You will not be placed in a school where your children attend, a relative is employed, or you have developed personal relationships. In addition, you will likely not be placed in the school system from which you attended.
• Finances: Finances cannot be considered when determining the internship placement.
• Out of Area/State Placements: Out-of-area/out-of-state placements are rare and only granted in extreme cases. To request an out-of-area/out-of-state placement, refer to the policy on the OSU Professional Education website. Note that the intern must appeal to the Field Experiences Committee for consideration, and, if granted, the intern bears all financial responsibility associated with placement, travel to on-campus meetings, supervision, and fees charged by a cooperating institution. Some programs facilitate international student teaching; check with your program for details.

NOTE: Check with your program area for information about any additional placement requirements for your certification area prior to completing your application.

Criteria for clinical practice placement for all Professional Education candidates are:
1. Continued full admission to a program in the Professional Education unit (see "Retention in Professional Education" on the previous page);
2. A current overall grade-point average of at least 2.50 (2.75 for Elementary Education);
3. A grade-point average of at least 2.50/2.75 in courses listed on the current approved program for certification in the areas of professional core, major, and college/departmental requirements (Exception - Secondary Education English requires 2.75 in major requirements). No grade lower than a "C" or a "P" in any of these areas;
4. Completion of all professional education course work that includes at least one course in social foundations, all early field experiences (60 clock hours minimum), exceptional learners, and human growth and development, with no grade lower than a "C" or a "P" in any of these courses. It is recommended that all professional sequence course work be completed.
5. Successful completion of submission II requirements for the Professional Education Program portfolio. The exact submission date for portfolio is set by the program certification area. Portfolios should contain the materials listed in the Portfolio Handbook (www.okstate.edu/peu/portfolio.htm) for the pre-internship submission and any additional items required by a specific program. The portfolio is completed in conjunction with the internship and should not be separate.
6. Successful completion of the appropriate subject area test for certification.

Required Grades in Clinical Practice. A candidate must receive grades of "P" in all sections of clinical practice in order to be recommended for a teaching certificate. A candidate assigned a grade of "F" in any section of clinical practice will not qualify for a recommendation for any level of certification.

Placements in clinical practice are made based on program faculty recommendation, availability of a qualified cooperating teacher, school district and site preferences, availability of a university supervisor, and candidate request. Candidates may not contact schools to secure their own placements. Candidates will not be placed in a school where a relative(s) attends or is employed or where the candidate has developed personal relationships with teachers or administration. In addition, candidates will not be placed in the school system from which they graduated. Exceptions cannot be considered when determining the internship placement. As a general rule, interns are placed within an approximate 75-mile radius of Stillwater.

Out-of-Area/Out-of-State Placements
A candidate requesting an out-of-area/out-of-state placement due to extenuating circumstances or seeking an assignment that provides exceptional professional experiences that would not be afforded by a local placement must submit a written request and receive the approval of the degree program area coordinator, the unit head, the Coordinator of Field Experiences and Clinical Practices, and the PEU Field Experiences Committee. Securing placements and supervision are the responsibility of the Office of Field Experiences and Clinical Practice and the program area coordinator.

Extenuating circumstances may include, but are not limited to, medical or health issues that would impede the progress of the pre-service candidate's internship, family issues that would cause a hardship in the pre-service candidate's ability to successfully complete the student teaching assignment, or an issue of personal concern that cannot be addressed through a change in local placement site. Financial exigency alone is not grounds for an out-of-area/out-of-state placement.

Candidates granted an out-of-area/out-of-state placement must meet all clinical practice deadlines and requirements, including attendance of on-campus meetings and are required to pay the following fees:
1. All necessary and appropriate fees required in securing and finalizing the placement (e.g., such as reimbursement for cooperating teacher, supervisor, etc.). These fees are payable to the Office of Professional Education or designated office and/or out-of-state university at the beginning of the semester in which the placement will be secured.
2. If a recommendation for certification is to be made by Oklahoma State University, the candidate is responsible for reimbursing visits performed by the cooperating institution. All other criteria pertaining to in-state clinical practice placements apply as previously stated.
3. OSU fees - A non-refundable administrative fee to cover time and extra work related to securing an out-of-area placement may be assessed when an approved request is submitted to the Clinical Practices Office. The fee is due upon approval of designated site/s.
4. Supervising teacher fees - The out-of-area/out-of-state supervising fee is determined by each supervisor, the out-of-area/out-of-state university, and the Field Experience and Clinical Practices Office and typically ranges from $400 to $800 to cover the expenses incurred to conduct the required observations and student teaching evaluations. Students are responsible for all costs related to their out-of-area/out-of-state supervision. The fee is to be paid to Office of Professional Education, who will then pay the supervisor.
5. Cooperating teacher fees - Whereas local cooperating teachers are compensated with free tuition vouchers, an out-of-area/out-of-state cooperating teacher may not benefit from such compensation.
6. Additional fees - The local (out-of-area/out-of-state) cooperating university may require a fee for supervision for student not enrolled in their university or require co-registration in additional credits as a student at their university to attend their student teaching seminars.

Exceptions to this policy are permitted for students who are enrolled in programs that have a specific out-of-area/out-of-state placement policy and for students who participate in special placements abroad.

Qualifications for consideration of out-of-state/out-of-area placement request:
1. Minimum cumulative 3.0 GPA and 3.0 GPA in content/certification area classes.
2. Successful interview with Program Area Coordinator presenting your request for an out-of-area placement
3. Recommendation from Program Area faculty
4. Agreement from local (out-of-area/out-of-state) university to supervise the student teacher
5. Availability and willingness of qualified university-affiliated supervisor to observe and evaluate student teacher
6. A memorandum of understanding signed by the student, the Program Area Coordinator, and the Coordinator of Clinical Practice must be on file prior to the request for placement being sent to the school district. The out-of-area/out-of-state university may require additional signed documentation.

The Internship Experience
The clinical practice intern is supported by their student teaching course instructor, the assigned OSU Supervisor and Mentor/Cooperating Teacher, and the School Principal. Mentor Teachers and OSU Supervisors are asked to complete training in co-teaching prior to the experience. If needed during the internship, the problem solving process includes the support team above as well as Professional Education Unit representatives. The Memorandum of Understanding candidates sign at the application stage signifies their understanding of conduct to be followed during the internship. A breach in this agreement can result in removal from the internship.

Insurance
School districts and OSU do not insure candidates during the internship; they are responsible for carrying their own medical insurance. By joining the SOEA (Student Oklahoma Education Association) or the POE (Professional Oklahoma Educators) candidates will have liability insurance during the internship experience.

Outside Activities/Classes during the Clinical Practice Internship
The clinical practice internship experience is considered the beginning of your professional career, and your energies should be directed toward making the most of your professional assignment. Therefore, outside employment or taking coursework other than the internship courses is definitely not advised during the internship. If you believe employment is a necessity, you must confer with your program area supervisor to determine if such employment should continue, or if you should consider completing your internship another semester.

Appeals
By enrolling in Professional Education programs at Oklahoma State University, students accept the responsibility for complying with all applicable Professional Education Council policies and procedures that allow them to maintain good academic standing. If the student believes that the established policies of the Professional Education Council have not been fairly or consistently followed, he/she has the right to pursue an appeal to the Student
Affairs Committee. For more detailed information pertaining to the appeals process, students are encouraged to contact the Office of Professional Education.

Certification Examinations for Oklahoma Educators
All candidates who graduate or are seeking recommendation for certification from a Professional Education program are required to complete the Certification Examinations for Oklahoma Educators before a license or area of certification can be issued. The examinations, which include a general education test, subject area tests, and a professional teaching exam (OGET, OSAT, and OPTE), are administered by the Evaluation Systems, Pearson for the Office of Educational Quality and Accountability. Registration materials are available online at www.ceoe.nesinc.com. Candidates for Elementary, Early Childhood and Special Education certification must also pass the Oklahoma Reading Test.


Teacher candidates must successfully complete the OGET prior to admission to Professional Education, the OSAT prior to student teaching placement and the OPTE at or near completion of their program.

Registration deadlines and score report dates are indicated on the website.

Recommendations for Certificate or Additional Certification Areas
Application information for an Oklahoma certificate can be obtained in the Office of Professional Education, 325 Willard. Candidates seeking advisement concerning teacher certificates can be assisted by the Certification Specialist in the Office of Professional Education.

Effective May 31, 2001, Title 68 O.S. 238.1 requires all certificate holders be in compliance with Oklahoma state income tax laws before a teaching certificate can be obtained or renewed.

Effective November 1, 2001, Oklahoma statute 70 O.S. 6-190 requires applicants for initial Oklahoma teacher certification to have a full federal fingerprint-based background clearance. The OSU Professional Education Unit is available to assist you in being fingerprinted at the beginning of your student teaching semester.

To receive Oklahoma State University's in-state or out-of-state certification ‘Recommendation’ or ‘Verification’ of program completion, the applicant must:
• be admitted and maintain admission to OSU’s Professional Education Unit
• complete the appropriate level of degree
• meet the Foreign Language Proficiency Requirement
• meet the Computer Proficiency Requirement
• complete the required courses with the required grades and grade-point-averages
• have confirmation of the final clearance of portfolio submission III
• pass the required Certification Examinations for Oklahoma Educators for Oklahoma certification
• complete the state’s application for certification.

Unless the applicant has successfully completed all of the above, Oklahoma State University will not make a recommendation or verify program completion for an in-state or out-of-state certificate.

A candidate assigned the grade of "F" in any section of clinical practice will not qualify for a recommendation for a license or any level of certification. Requirements for certification and degrees are not necessarily the same thing. Candidates must meet all other certification requirements, including portfolio and foreign language proficiency if appropriate.
The vision of the College of Engineering, Architecture and Technology (CEAT) is “To be the leading public university in engineering, architecture, and technology that embraces diverse students and prepares them to deliver excellence in advanced learning, leadership, relevant research, and benefits to society.”

“Our mission is to provide a diverse population with a quality education in engineering, architecture and technology. Through CEAT, OSU develops ethical leaders who promote economic and community vitality with technical knowledge, innovation, and communication expertise that connects scientific research, professional education, technical assistance and scholarship to industry, the State of Oklahoma, the nation and the world.”

The College of Engineering, Architecture and Technology is a community of scholars, innovators and leaders that is transforming our lives. The preparation of professionals that anticipate the needs of a changing world is at the nexus of society, economy, ethics, sustainability and humanity. The College is committed to training professionals that innovate, design and build projects that provide solutions for both the developed and the developing world.

The mission of the College of Engineering, Architecture and Technology (CEAT) is one that embraces students from diverse backgrounds to imagine and discover the challenges of engineering, architecture and technology, and to bring about innovation using their proficiency in science, mathematics, communications, ethics and humanity. This mission is built on the foundation of the University’s mission and the expectations of a world class university.

As Oklahoma’s land-grant university, CEAT fulfills the most fundamental premise that founded OSU; to promote economic and community viability through technical assistance, academic and professional education, training and communications, ethics and humanity. The College is committed to training professionals that innovate, design and build projects that provide solutions for both the developed and the developing world.

As we progress into the future, professionals with a higher education will continue to be largely responsible for shaping our world. The power they exercise is an exciting prospect and presents a sobering responsibility. Less complex problems have been solved and are now a part of history. Many difficult problems remain. The need for talented and highly trained professionals is obvious; one will be embarking on a lifetime of challenge as he or she prepares for a career in engineering, engineering technology or architecture at Oklahoma State University.

The College of Engineering, Architecture and Technology offers a complete spectrum of educational opportunities designed to give graduates the capability and flexibility to meet the ever-changing needs of a society that is committed to technological innovation. To make continuing contributions, engineers, architects and technologists must have many abilities at their command. The modern tools and processes of industry must be understood. The processes of design and analysis require a firm understanding of mathematics and the sciences. An effective engineer, architect or engineering technologist must develop sensitivity to human needs, ideas, institutions and cultures. These programs prepare graduates to be effective contributors within human organizations and provide an increased understanding of both the technical and non-technical factors that shape our human environment. With this firm foundation, and a commitment to lifelong learning, College of Engineering, Architecture and Technology graduates are fully prepared to make contributions to society throughout their professional careers.

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 Engineering, Biosystems Engineering with options in biomechanical, bioprocessing and food processing, environment and natural resources; Chemical Engineering with options in environmental, biomedical/biochemical and premedical; Civil Engineering with an option in environmental; Computer Engineering; Electrical Engineering; Industrial Engineering and Management; and Mechanical Engineering with options in premedical.

Master of Science in Biosystems Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering with options in Control Systems and Optics and Photonics, Engineering and Technology Management, Environmental Engineering, Industrial Engineering and Management, and Mechanical and Aerospace Engineering with an option of Unmanned Aerial Systems.

Doctor of Philosophy in Biosystems Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering and Management, and Mechanical and Aerospace Engineering.

School of Architecture:
- Bachelor of Architecture, Bachelor of Architectural Engineering.

Division of Engineering Technology:
- Bachelor of Science in Engineering Technology in Construction Management Technology with options in building and heavy, Electrical Engineering Technology with a computer option, Fire Protection and Safety Engineering Technology, and Mechanical Engineering Technology.

Accreditation
Undergraduate engineering programs are separately accredited by the Engineering Accreditation Commission of the ABET, http://www.abet.org. Specifics of accreditation are found in the sections devoted to each program on the following pages.

The Bachelor of Architecture program is accredited by the National Architectural Accrediting Board, Inc., phone 202.783.2007.

The undergraduate engineering technology programs are separately accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org. Specifics of accreditation are found in the program descriptions in the section "Division of Engineering Technology."

Special College Programs
Cooperative Education Program (Co-op) provides an avenue for undergraduate students to complete a year of full-time work experience directly related to their academic studies. Co-op students alternate terms of major-related employment with terms of full-time course work to achieve a quality education and industry experience. In addition to professional development, participation in the Co-op program earns academic credit and maintains full-time enrollment status for students during the work experience terms.

CEAT Scholars Program provides educational experiences for a select group of gifted students to develop and enhance their technical competence, worldview, professional and public responsibility, and leadership skills. Based on demonstrated academic and leadership potential, approximately 25 freshmen are selected each year, by application and interview, to enter this four year program. Students participate in special lectures, regional tours, residence hall programs, seminars, personal development activities, faculty mentoring, and summer tours in the U.S. and abroad.

CEAT Freshman Research Scholars Program provides opportunities for accelerated intellectual development of a select group of students. Each student is assigned a research faculty mentor and participates in a research program. The initial assignment is for one year and it may be extended based on student interest, research project continuation and mentor availability.

Career Services. The Career Services Office for the College of Engineering, Architecture and Technology is dedicated to helping students reach their career goals. CEAT Career Services provides individualized career assistance, specialized workshops, and resources on a variety of topics including: career exploration, job search strategies, resume and job search correspondence preparation, interviewing skills, and salary negotiation. The office also supports the Cooperative Education Program (Co-op) and provides individual career assessments for undergraduate students. As part of the OSU Career Services system, CEAT Career Services works in close partnership with CEAT Student Academic Services to link academic and career success.

College Administration
Paul J. Tikalsky, PhD, PE, FAICE, F.ACI, EACR—Dean
Ramam P. Singh, PhD—Associate Dean of Academic Affairs
Charles F. Bunting, PhD—Associate Dean for Research
Ed Kirtley, MA—Assistant Dean of Outreach and Extension

Campus Address and Phone:
281 Advanced Technology Research Center, Stillwater, OK 74078
405.744.5140
Website: www.ceat.okstate.edu
CEAT Living Unit Programs. CEAT residential floors have been established in the Allen Residence Halls for both male and female CEAT students. Living/ Learning Communities provide an atmosphere that is conducive to study, the students experience a community where they can work together, have access to tutoring, and serve as role models for other students. Special activities are planned for the floors, including events with faculty and other leaders.

Departmental Clubs and Honor Societies
Alpha Epsilon (Biosystems and Agricultural Engineering Honor Society)
Alpha Pi Mu (Industrial Engineering and Management Honor Society)
Alpha Chi (Architecture Honor Society)
Amateur Radio Club - WSJY
American Indian Science and Engineering Society
American Institute of Architecture Students
American Institute of Aeronautics & Astronautics
American Institute of Chemical Engineers
American Society for Quality
American Society of Agricultural and Biological Engineers
American Society of Civil Engineers
American Society of Heating, Refrigeration and Air Conditioning Engineers
American Society of Mechanical Engineers: International
American Society of Safety Engineers
Architectural Engineering Institute
Architecture Students Teaching Elementary Kids (ASTEK)
CEAT Student Council
Chi Epsilon (Civil and Architectural Engineering Honor Society)
Construction Management Society
Construction Specifications Institute
Cowboy Motorsports Quarter Scale Tractor Team
Engineers Without Borders
Eta Kappa Nu (Electrical and Computer Engineering Honor Society)
Fire Protection Society
Institute for Operations Research and the Management Sciences
Institute of Electrical and Electronics Engineers (two student branches)
Institute of Industrial Engineers
Institute of Transportation Engineers
International Fluid Power Society
International Society for Automation
Omega Chi Epsilon (Chemical Engineering Honor Society)
Pi Tau Sigma (Honorary Mechanical Engineering Society)
Sigma Lambda Chi (Construction Management Technology Honor Society)
Society of Automotive Engineers
Society of Automotive Engineers Formula Racing Team
Society of Automotive Engineers Mini-Baja Team
Society of Black Engineers, Technologists & Architects
Society of Hispanic Professional Engineers
Society of Manufacturing Engineers
Society of Women Engineers
Student Association of Fire Investigators
Student Firefighter Combat Challenge Team
Tau Alpha Pi (Technology Student's Honor Society)
Tau Beta Pi (Engineering Student's Honor Society)

CEAT Honors Program
The OSU Honors College provides challenges for undergraduate students of unusually high ability, motivation and initiative. Honors classes, seminars and independent study courses are designed to align students and instructors in a manner that encourages discussion and provides 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 OSU Honors College requirements.

Information regarding The Honors College at OSU, and Scholar Development/Leadership Programs can be found in the Catalog, in the Academic Enrichment Programs section.

Scholarships
Several CEAT scholarships are funded through the generosity of alumni, private, and corporate donations. Awards are available for undergraduate students at all levels, and are granted on the basis of academic achievement, campus involvement and leadership potential, as well as financial need.

Freshmen and undergraduate transfer students are automatically considered for CEAT scholarships through their applications for admission to OSU. For full scholarship consideration, students should apply for admission by February 1st priority deadline.

Current undergraduate (continuing) students should submit applications for general CEAT scholarships online at http://www.ceat.okstate.edu/scholarships. Students should also check with their individual departments for information regarding scholarships specific to their majors.

High School Preparation
In addition to the curricular requirements for admission specified by OSU, the College of Engineering, Architecture and Technology strongly recommends that students have a fourth year of mathematics and an additional year of laboratory science.

General Education Requirements
For students in Engineering, Architecture and Technology, courses in the humanities and social sciences provide both a broad education and essential background for addressing the critical issues of society. Students in the College must take General Education courses consistent with those specified on the degree requirement sheet. Each student should visit with his or her adviser to ascertain that appropriate courses are being selected. Students in some programs are required to complete a course in technical report writing. 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 specific program requirements. See Academic Regulations 3.5 for further details.

Computing Requirements
For students in Engineering, Architecture and Technology, the college requires that all students have several basic tools. Students in the College must have a scientific calculator and a laptop computer. The scientific calculator should be capable of computing trigonometric functions, logarithmic and natural logarithmic functions, basic statistical analysis, and all algebraic functions. The laptop requirements are published on the college IT website http://ceat-its.okstate.edu.

Schools of Engineering
Each of the schools of engineering offer Bachelor of Science, Master of Science, and Doctor of Philosophy degree programs. 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 University Catalog.

The common curricular objectives for the engineering programs are to develop each student's: (1) capability to delineate and solve the engineering problems of society in a practical way, (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 responsibilities to protect both occupational and public health and safety, and (5) ability to maintain professional competence through life-long learning.

Class Placement
Initial placement in OSU mathematics courses is by placement examination to ensure that each student will be challenged, but has the preparation to be successful in the first mathematics course. Placement in science courses is based on prior preparation in the science and completion of or placement beyond prerequisite mathematics courses. When appropriate, a student with an exceptionally strong background can obtain academic credit by advanced standing examination or by College Level Examination Program (CLEP) tests.

Academic Advising
The College's Office of Student Academic Services provides advisement for all engineering pre-professional school students. At the time of admission to Professional School, typically in the third year of studies, he or she will be assigned a faculty adviser in the school of their major (within the college).

Each student is personally advised in the planning and scheduling of his or her course work, assisted with the selection of a major, and is counseled and advised individually on matters of career choice, activities at OSU, and on other academic matters.

Each student, and his or her adviser, carefully selects general education, core engineering, and elective courses to meet the curriculum objectives and accreditation criteria. Specific criteria include appropriate computer-based experiences, knowledge of probability and statistics, and oral communications, an understanding of ethical, social, economic and safety considerations, and engineering design experiences that are integrated throughout the curriculum. An introduction to the engineering field and the majors available in the college, is presented in ENGR 1111. In this student development course, students will also learn how to be successful as engineering students and will be well informed of the many resources that are available on campus to promote their success.

To assist students in planning and mapping their academic success, an electronic account is created for each student at the time of initial enrollment. Students have access to their personal account, via the STAR System, where they can review their advising materials, degree sheet, flowchart and other documents. The adviser assists the student with academic decisions and works to ensure accuracy and compliance; however, the ultimate responsibility for meeting degree requirements rests with the student.
The Engineering Professional School Concept

A student entering OSU is admitted into the pre-professional school program and will complete coursework that is typically taken during the first two years of an engineering curriculum. Near the completion of this course work, the student is considered for admission to one of the engineering professional schools of the College to continue in the upper-division program. After satisfying admission standards, the student will be permitted to pursue a curriculum leading to the Bachelor of Science degree in his or her discipline.

Pre-Professional School. In each school of engineering, lower-division course work is devoted to preparing the student for professional school. The content of the pre-professional school program is similar for most engineering specialties and includes English composition and technical course work devoted to mathematics through calculus and differential equations, general chemistry, general physics, engineering and engineering sciences.

Transfer students will be admitted directly to pre-professional school if they satisfy all OSU resident transfer student requirements and have a GPA of at least 2.00 not to include activity, performance or remedial courses in the most recent semester completed.

Regardless of previous background, all new engineering students must enroll in ENGR 1111, BAE 1012 (if the student plans to study biosystems engineering), or ARCH 1112 (if the student plans to study architectural engineering). New students who do not have a strong preparation in mathematics and science will be required to complete additional course work before enrolling in required courses in these subjects. Students transferring to pre-professional school 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.

Students not directly admissible to pre-professional school, but those who meet OSU requirements for admission, may be admitted to the university’s Learning and Student Success Opportunity (LASSO) Center, where they will be advised for two to three semesters. Students interested in transferring in from the LASSO Center to CEAT must meet academic requirements as documented by CEAT and filed in the LASSO Center.

International student applications must be received by June 15, November 1 or April 1 for the fall, spring and summer terms, respectively, to be considered for admission to pre-professional school.

Professional School. 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 in the right column on the degree requirement sheet. Degree requirement sheets can be found in the university’s publication of Undergraduate Programs and Requirements, available online. Upon completion of all degree requirements, the student is awarded the Bachelor of Science degree.

Engineering Professional School Admission Requirements

All undergraduate engineering students must follow the curriculum and requirements for their chosen engineering major, as prescribed in the university’s publication of Undergraduate Programs and Requirements, for their matriculation date, or upon their election, a later annual version of that publication. Students are encouraged to carefully read the program requirements for their chosen major and matriculation date.

To be admitted to one of the professional schools of engineering, the student must:

1. Complete a minimum of 60 credit hours of courses listed on the degree requirement sheet from an accredited institution of higher learning.
2. Complete all required (shaded) courses on the degree requirement sheet.
3. Earn a grade of “C” or better in technical courses required for the degree and taken prior to admission to professional school. In these courses, meet or exceed the Technical GPA requirement listed in the Departmental GPA Requirements section below (when applicable).

Note: Technical courses include astronomy, biology, biochemistry, chemistry, geology, engineering (BGE, CHE, CIVE, IEM, ECEN, ENGR, ENSC, MAE), math, physics, statistics, zoology, and any additional science courses listed on the degree requirement sheet.

4. Complete a minimum of 12 credit hours of courses at OSU, required for the degree. In these courses, meet or exceed the OSU GPA requirement listed in the Departmental GPA Requirements section below (when applicable).

5. Complete a minimum of 9 credit hours of technical courses at OSU, required for the degree. In these courses, meet or exceed the OSU Technical GPA (all technical courses required for the degree taken at OSU) listed in the Departmental GPA Requirements section below (when applicable).

6. Earn a final grade of “C” or better in all courses submitted to satisfy the University’s English requirement.
7. Meet any additional requirements for the selected major, as specified below.
8. Demonstrate an acceptable level of academic competence in subject material comparable to that covered in pre-professional school as defined by the selected professional school below. Such demonstration may be by completion of course work or by examination with not more than half the requirements satisfied by examination.

Departmental GPA Requirements

All specified GPAs are calculated based on the last grade earned in repeated courses. The minimum GPA requirements by school, and any additional requirements, are as follows:

a. School of Biosystems and Agricultural Engineering:
   GPA Requirements for Professional School: Technical GPA-2.50, OSU GPA-2.50, OSU Technical GPA-2.50
b. School of Chemical Engineering:
   GPA Requirements for Professional School: Technical GPA-2.70, OSU GPA-2.50, OSU Technical GPA-2.70. A final grade of “C” or better must be achieved in the most professional courses (underlined on the degree requirement sheet). If a “C” is obtained in ENGL 1113 or 1313, ENGL 1213 or 1413 is also required.
c. School of Civil and Environmental Engineering:
   GPA Requirements for Professional School: Technical GPA-2.50, OSU GPA-2.50, OSU Technical GPA-2.50, and a grade of “C” or better in each course that is a prerequisite for a CIVE course and in all required technical pre-professional courses (underlined on the degree requirement sheet) whether taken prior to professional school or not.
d. School of Electrical and Computer Engineering:
   GPA Requirements for Professional School: Technical GPA-2.70, OSU GPA-2.60, OSU Technical GPA-2.70

e. School of Industrial Engineering and Management:
   GPA Requirements for Professional School: Technical GPA-2.50, and a grade of “C” or better in each course that is a prerequisite for an IEM course and professional courses (underlined on the degree requirement sheet) whether taken prior to professional school or not.
f. School of Mechanical and Aerospace Engineering:
   GPA Admission Requirements for Professional School: Technical GPA 3.0, OSU GPA-3.0, OSU Technical GPA-3.0

Admission and degree Requirements: a grade of “C” or better in each course that is a prerequisite for an MAE course and in all technical pre-professional courses (underlined on the degree requirement sheet) whether taken prior to professional school or not.

Minimum GPA Requirements for Graduation: Overall GPA 2.50, GPA for MAE prefix classes 2.5, GPA for MAE 4000 level courses 2.5.

Students may enroll in no more than nine hours of upper-division major requirements prior to admission to professional school or not.

Bio systems and Agricultural Engineering

Daniel L. Thomas, PhD, PE—Professor and Head

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 create and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling of agricultural and other biological products, while at the same time providing for a quality environment and preserving and protecting natural resources. Biosystems engineers directly address problems and opportunities related to food, water, energy, and the environment—all of which are critical to the quality of life in our society. Subject-matter specialization is provided through the following three undergraduate option areas: bioprocessing and food processing, environment and natural resources and biomechanical.

Biosystems engineering courses integrate engineering sciences, physical sciences, and biological sciences, and teach students to address real-world challenges. With the guidance of experienced faculty, students work both as individuals and in teams to design creative solutions to complex problems.

The overall objective of the undergraduate biosystems engineering degree program is to provide the comprehensive education necessary to prepare students for successful, productive and rewarding careers in engineering for agricultural, food and biological systems.

Within a few years of graduation, Biosystems Engineering program graduates will become top professionals, managers or leaders in a wide variety of industries and organizations involved with biosystems engineering, where they apply discovery, problem solving, and leadership skills for the benefit of their organization and the society at large.

The undergraduate educational program is divided into two components—pre-professional and professional. In the pre-professional portion of the biosystems engineering program (usually equivalent to two years of study) the focus is on the underlying biological, physical, chemical and mathematical principles of engineering, supplemented by appropriate general education courses in English,
social sciences and humanities. Students who demonstrate proficiency in this portion of the program are eligible for admission to the professional school in biosystems engineering.

The professional school portion of the biosystems engineering curriculum (typically two years) builds systematically upon the scientific knowledge acquired in the pre-professional curriculum. In professional school, students have the opportunity to focus on option areas listed above. The degree is accredited by the Engineering Accreditation Commission of ABET (see www.abet.org) under criteria for biological engineering and similarly named programs.

Each professional school course builds upon preceding engineering courses to develop in the student the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work incorporates the social and economic aspects of technical problems, and stresses the responsibilities of engineering professionals to behave ethically and promote occupational and public safety. The program culminates in senior year design courses in which students integrate the analysis, synthesis and other abilities they have developed throughout the earlier portions of the program into a capstone experience. At this point, students are able to design components, systems and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. The students have also demonstrated and displayed the ability to conduct experiments essential to specific studies and to analyze the experimental results that lead to meaningful conclusions.

The biosystems engineering program verifies that students possess core engineering knowledge and capability by requiring students to take the Fundamentals of Engineering exam, which is an important step toward becoming a professional engineer. All candidates for the BS degree in biosystems engineering must take the Fundamentals of Engineering exam prior to receiving their degree.

An integral part of this education continuum, from basic science through comprehensive engineering design, are learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. To achieve this, the program provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and utilized as a part of their problem-solving experiences. Finally, the students' experience in solving ever-more-challenging problems enables them to continue to learn independently throughout their professional careers.

A wide variety of employment opportunities are available for biosystems engineers in industry, public service and education. Some of these opportunities include positions in government agencies, consulting engineering firms, and agricultural and food equipment industries. Biosystems engineers are employed throughout the U.S. as well as internationally.

Students interested in a degree in biosystems engineering may initially enroll in the College of Engineering, Architecture and Technology or the College of Agricultural Sciences and Natural Resources. Through either college, they will be assigned a Biosystems engineering advisor.

Graduate Programs
The Department of Biosystems and Agricultural Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees in biosystems engineering. These degrees emphasize research and development. Excellent laboratory and computer facilities are available for students to explore research and design in such areas as bioprocessing, food engineering, sensor and control technology, waste management and utilization, hydrology, water quality, porous media flow, and intelligent systems for agricultural machine design and production.

Research projects are supported by the Oklahoma Agricultural Experiment Station and by state, federal and private grants and contracts. Well-trained faculty members, 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, manage the project to completion, and report the results through peer-reviewed papers and professional presentations.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Engineering Accreditation Commission of ABET (www.abet.org). Students without accredited degrees may be admitted provisionally and may be required to take additional courses.

A student must be advised by a department advisor in the pre-professional admission to the graduate program.

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

Chemical Engineering
James R. (Bob) Whiteley, PhD—Bartlett Chair, Professor and Head
Chemical engineers use knowledge of how nature works (science) and the language of science (mathematics) to create value and solve difficult problems for the benefit of society. The key skill that differentiates chemical engineering from other disciplines is the ability to understand, design and operate transformation (chemical or physical) processes. Chemical engineers literally change (transform) the world. Many in the public assume chemical engineers work only in chemical plants and petroleum refineries. The reality is that chemical engineers work in a broad range of industries including pharmaceuticals, biochemicals, semiconductor materials, foods, plastics, paper, steel, consumer goods, automotive, specialty materials, oil & gas production, renewable energy, engineering services, and the list goes on. Key to providing a benefit to society, chemical engineers are responsible for resource conservation, minimizing pollution, minimizing costs, and maximizing quality and safety of processes that make the products.

The emphasis on the molecular or chemical nature of everything people use is what makes chemical engineers different from other engineers. The emphasis on the processes that make the products is what makes chemical engineers different from chemists.

Chemical engineers often find themselves defining a problem or product, developing a process to do what is needed, and then designing the equipment to carry out the process. After the installation, chemical engineers commonly manage operations, oversee equipment maintenance, and supervise control of production. They trouble-shoot problems that hinder smooth operations, and they plan for future expansions or improvements. Their training and knowledge make them well qualified to market products and processing equipment. The varied background and experience of chemical engineers make them ideally suited for advancement into technical, managerial and executive positions. An advanced degree in chemical engineering is not required.

Many who aspire to careers in medicine or law first obtain BS degrees in chemical engineering. The rigor of the program and the emphasis on critical thinking and analytical reasoning are highly valued by professional school admission committees. A career as a research scientist or academic typically requires a PhD degree.

Program Educational Objectives. The School has three broad objectives. Within the first few years after graduation, our BS graduates will have demonstrated:

1. Competencies – skill in tools and techniques that are fundamental to the job - wish preparation for medical school; and (3) the biomedical/biochemical option is wish preparation for medical school. To achieve this goal, the program is designed to progressively develop both technical and human skills.

In the pre-professional portion of the chemical engineering program (usually equivalent to two years of study), the focus is on the underlying scientific and mathematical principles of engineering, supplemented by appropriate general education courses in English, social sciences and humanities. Students who demonstrate proficiency in this portion of the program are eligible for admission to the professional school.

The curriculum in the professional school (typically the last two years) builds systematically upon the scientific knowledge acquired in the pre-professional curriculum. In professional school, students have the opportunity to focus in one of three emphasis areas: (1) the regular course prepares a graduate for a wide range of employment opportunities; (2) the pre-medical option is for those who wish preparation for medical school; and (3) the biomedical/biochemical option is for those who wish preparation for medical school. Each emphasis area is accredited under the basic level EAC-ABET criteria for chemical engineering programs and each prepares a student for success in both employment and graduate study at OSU or other universities. A more complete description of exact degree requirements for the bachelor's-level curriculum is given in the publication Undergraduate Programs and Requirements at OSU.

Each professional school course builds upon the preceding chemical engineering courses to develop the ability to identify and solve meaningful engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The course work includes sensitizing students to socially-related technical problems and their responsibilities as engineering professionals to behave ethically and protect occupational and public safety. The program culminates in the senior-year design course, in which the students integrate the analysis, synthesis and other abilities they have developed throughout the earlier portions of their study into a capstone experience. At this point, students will be able to design components, systems
and processes that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. The students will have developed and displayed the ability to design and conduct experiments essential to specific studies, and to analyze the experimental results and draw meaningful conclusions within an enterprise context.

Integral parts of this educational continuum from basic science through comprehensive engineering design are authentic experiences that facilitate the students’ abilities to function effectively in both individual and collaborative environments. To achieve this, the program provides every student with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and utilized as a part of their problem-solving experiences. Finally, the students’ experience in solving ever-more-challenging problems gives them the ability to continue to learn independently throughout their professional careers.

Graduate Programs
The School of Chemical Engineering offers programs leading to the Master of Science and Doctor of Philosophy. 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 ABET or a recognized equivalent from any international program.

Students with related undergraduate degrees, such as chemistry, automation engineering, etc., can be admitted conditionally, subject to completion of prescribed undergraduate Chemical Engineering program courses. Admission is competitive based on undergraduate GPA, GRE and TOEFL (for international students), statement of interests, experience and recommendations.

The Master of Science Degree.
Two options are offered for this degree. Research-Directed, Practice-Oriented options. General requirements for the Research-Oriented MS degree in chemical engineering are 30 credit hours of work beyond the BS degree and an acceptable thesis. At least 18 hours must be in class work and a minimum of six hours of credit is required for thesis research. The general requirements for the Practice-Oriented MS degree are 32 credit hours of work beyond the BS, including two hours of credit assigned to an acceptable technical report. For both options, the courses taken must include CHE 5123, 5213, 5743 and 5843.

The Doctor of Philosophy Degree.
The general credit requirement is a minimum of 90 credit hours beyond the BS options, totaling at least 36 hours of credit for research and at least 30 hours of class work. The courses must include CHE 5123, 5213, 5743, 5843, and 6703. Each student is responsible for consultation with his or her advisory committee in preparing the study plan.

Civil and Environmental Engineering
Norbert (Norb) Delatte, PhD — Professor and Head
Civil engineers build the future. The exceptional diversity of professional practice in civil and environmental engineering presents many career opportunities for students.

The concern of civil engineers is infrastructure - the design, construction, management, alteration and utilization - which allows society to function. Civil engineers plan, design and construct, highways, waterway and railway systems, harbors and shipping facilities, systems for the treatment and distribution of water and for the collection and treatment of municipal and industrial waste, dams and hydroelectric works, airports and terminals, structures of every kind including buildings, bridges, towers, industrial plants, tunnels and subway systems, processes 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-professional courses in mathematics, physical sciences and engineering sciences. On this foundation, required courses equip the student with 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 enable the student to apply the practical solution of problems in the field.

Educational Objectives.
The Bachelor of Science in Civil Engineering degree program educates and prepares engineers who a few years after graduation will be:
1. Contributing to society through the practice of civil engineering in a variety of contexts, including the protection of public health and safety and the development of sustainable engineering solutions;
2. Effectively applying the technical knowledge, engineering principles, communication skills and personal attributes necessary to be adaptable and successful in the civil engineering profession;
3. Advancing within their profession, including retaining professional licensure and positions of leadership; and
4. Exhibiting life-long learning, including the pursuit of advanced degrees.
The curriculum is designed to enable students to satisfy the educational objectives in conjunction with the student outcomes. These outcomes state that graduates of the program will have: (a) an ability to apply knowledge of mathematics, science, and engineering, (b) an ability to design and conduct experiments, as well as to analyze and interpret data, (c) an ability to design systems, components, or processes to meet desired needs within realistic constraints (such as economic, environmental, social, political, ethical, health, safety, and sustainability), (d) an ability to function on teams, (e) an ability to identify, formulate, and solve engineering problems, (f) an understanding of professional and ethical responsibility, (g) an ability to communicate effectively, (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context, (i) a recognition of the need for, and an ability to engage in life-long learning, including an understanding of the importance of professional licensure, (j) a knowledge of contemporary issues, and (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The School provides a curriculum that is effective and balanced among the major areas of civil engineering practice. Design capabilities are developed through the development of laboratory experiences in the practice of civil engineering, incorporating much of the previous course work. 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 option for those students wishing to concentrate more heavily in the environmental area of practice. Program curricula requirements are outlined in the publication Undergraduate Program and Requirements. The general civil option and the environmental option are accredited together by the Engineering Accreditation Commission of the ABET under the criteria for civil and similarly named engineering programs.

Southern Plains Transportation Center. Oklahoma State University, and several other universities are members of the Southern Plains Transportation Center (SPTC). The regional transportation center is a US DOT designated Region 6 University Transportation Center (UTC) and cooperative venture with the Oklahoma Department of Transportation (ODOT), and other transportation agencies, operators and suppliers. The mission of the Center is to develop and transmit knowledge through research, training, technical assistance, and technology transfer; and to enhance the transportation systems that touch the lives of the people of Oklahoma and the region.

Graduate Programs
The School of Civil and Environmental Engineering offers three programs leading to post-baccalaureate degrees—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 Science degree is characterized by a technical specialization in a particular area of study. The Doctor of Philosophy degree is designed to prepare students for research and for the teaching profession in engineering.

Major areas of study in the School are applied mechanics, structural analysis, design, transportation, materials, construction engineering and management, geotechnical engineering, water resources, and environmental engineering. Research in all major fields is continuously pursued. Master of Science in Civil Engineering candidates may choose either to specialize or to take a broader-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 should have graduated from a civil engineering curriculum accredited by ABET. 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 credit hours beyond the bachelor’s degree, including a research thesis for which no more than six credit hours may be granted. The non-thesis option (32 credit hours) described in the Graduate College section may be permitted at the discretion of the student’s advisory committee.

The Doctor of Philosophy degree requires the completion of at least 90 credit hours of course work beyond the bachelor’s degree, including a research thesis for which no more than 30 credit hours may be counted. In addition, the candidate must meet the equivalency of the language requirement (six hours) in selected areas at the discretion of his or her committee to facilitate his or her research. 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
Jeffrey L. Young, Ph.D., P.E.—Professor and Head

The School of Electrical and Computer Engineering is highly recognized throughout the nation for its student-centered, laboratory intensive curriculum, and is a partner of choice for employers seeking well educated, highly motivated, and uniquely creative college graduates dedicated to life-long learning. The School has devoted professors from prestigious universities who serve, instruct, and mentor undergraduate and graduate students pursuing B.S., M.S., or Ph.D. degrees in electrical engineering or a B.S. degree in computer engineering. Both the undergraduate Electrical Engineering and Computer Engineering Programs are accredited by ABET—the leading accreditor of engineering programs—to assure students, parents, industry partners, and other stakeholders that our programs are of the highest quality.

Electrical engineers and computer engineers have been at the center of the technological revolution that has occurred over the past 100 years. Marvels such as the transistor, radio, telephone, television, internet, microprocessor, computer, radar system, motor, wind generator, GPS, smart wireless device, laser, microwave oven, electric car, pace maker, and the flat panel display, to name only a handful, have resulted from the hard work and creative talents of electrical engineers and computer engineers. And since electricity and computers are essential in a modern society, the electrical engineer and the computer engineer will always be in high demand.

Electrical engineering encompasses many exciting subdisciplines including energy systems, machines, power electronics, analog electronics, digital electronics, mixed-signal electronics, VLSI chips, instrumentation, sensors, signal processing, machine vision, communications, control systems, robotics, wireless devices, electromagnetic fields, photovoltaics, photonic devices, embedded controllers, networking, software development, biomedical devices, and computer architecture. The School encompasses all of these subdisciplines in its curriculum or research activities.

Computer Engineering is a relatively young engineering discipline that combines a strong foundation in electrical engineering with elements of computer science, including hardware and software integration, and design. Computer engineering includes digital logic design, computer architecture, digital data communications, computer and sensor interfacing, microprocessors, digital control, VLSI circuits and systems, operating and software systems, and computer arithmetic.

The School of Electrical and Computer Engineering (ECE) offers a full range of undergraduate and graduate program choices that allow students to excel in their careers. Moreover, a degree in electrical engineering or computer engineering is an excellent foundation for other professional fields such as medicine and law. Many graduates also pursue advanced programs in business and management after earning a degree in engineering.

Beyond creating technology, electrical and computer engineers of tomorrow must be aware of the social, economic, ethical and environmental impact of their respective technologies. They must also communicate effectively, possess excellent teamwork skills, and understand, perform, and complete the process of engineering design. The undergraduate programs in electrical engineering and computer engineering at Oklahoma State University equip graduates with these critical skills.

Program Educational Objectives. The Program Educational Objectives reflect the aspirational expectations for our electrical engineering and computer engineering graduates as they enter their professional careers. Specifically:

- Our Graduates will be widely employed across the range of subdisciplines within electrical engineering and computer engineering, and will be highly sought after by industrial, academic, non-profit, and governmental organizations.
- Our Graduates will compete in a technologically changing world, collaborate in a diverse workforce, and communicate effectively their knowledge and ideas to colleagues, employers, customers, and stakeholders.
- Our Graduates will be recognized leaders, team players, problem solvers, innovators, and entrepreneurs in their profession.
- Our Graduates will identify and contribute to solving grand-challenge problems that improve the lives of people in Oklahoma, the United States, and around the world, serving their communities and their profession to produce a lasting, significant, and positive impact.
- Our Graduates will abide by the highest ethical standards of professional practice in a technologically changing, professional environment.
- Our Graduates will continue to develop professionally throughout their lives by being adaptive learners with a never ending desire to assimilate new knowledge and embrace new technologies.
- Our Graduates will have the knowledge to earn professional registration or certification in their field or earn an advanced post-graduate or professional degree should they choose.
- Our Graduates will make a positive difference in the world.

Student Learning Outcomes. To support these Program Educational Objectives, the School has established Student Learning Outcomes that are regularly assessed and expected of all students upon completion of their chosen program in Electrical Engineering or Computer Engineering. These include:

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The undergraduate electrical engineering and computer engineering programs at Oklahoma State University prepare each graduate for a life-long professional career. During the first two years of study, students enter into Pre-Professional School and complete a carefully designed program consisting of mathematics, physics, chemistries, engineering sciences, introductory electrical and computer engineering courses, computer science, and selected courses in the humanities and social sciences. After successfully completing Pre-Professional school, and, enroll in specific electrical engineering and/or computer engineering courses.

Students majoring in electrical engineering or computer engineering can obtain life-enhancing skills needed by tomorrow’s professionals.

For electrical engineering students, these skills are learned through our curriculum in five areas of specialization that enable students to customize course choices to gain both a breadth of knowledge and a depth of understanding in their chosen area.

Computer engineering students learn these skills by focusing on their own challenging specialized curriculum, which is also designed to provide breadth and depth within the discipline.

By tailoring the program to align student interests with faculty strengths, the School enhances faculty-student interactions which ensures academic and career guidance. All electrical engineering areas of specialization, as well as computer engineering, provide multiple engineering design experiences throughout Professional School. In addition to laboratories devoted to research, separate instructional laboratories grant opportunities for hands-on experience in areas such as microcomputers, digital logic design, electronics, electrical machinery, networks, instrumentation, optics, real-time digital signal processing and electromagnetics.

Laboratories also serve to emphasize concepts learned in the classroom while students participate in engineering design.

Engineering design laboratories require students to solve open-ended problems in a manner that demonstrate the students’ ability to apply fundamental concepts, creativity, and imagination, and to solve realistic problems of practical importance. These problems have several possible solutions; students must choose an acceptable approach and demonstrate that the desired outcomes have been met.

The capstone design experience is a two-course sequence typically taken during the student’s last two semesters of the program that gives our students an opportunity to apply and demonstrate the skills that have developed throughout the program. These courses integrate theory analysis, simulation, design, and experimental skills the students have developed during their course of study. Teamwork, communication skills, and the complete engineering design process, from problem definition to prototype that includes both presentation and documentation, are emphasized.

Student teams receive individual project mentoring from an appropriate faculty member who provides project management and supervision. The capstone experience concludes with a formal public design demonstration, oral presentation, and written report. The new ECE Design Commons, an advanced design laboratory available to all students in electrical engineering and computer engineering, provides state-of-the-art capabilities for design, prototyping, testing and diagnostics of advanced hardware and software systems.

Graduate Programs

The School of Electrical and Computer Engineering offers two graduate degrees, both in electrical engineering: Master of Science and Doctor of Philosophy. Specialized MS degree options in 1) control systems and 2) optics and photonics are also available, as are interdisciplinary graduate degrees in several specialties. These graduate degree programs are flexible in course selection and emphasis.

The Master of Science degree emphasizes advanced design, development and is intended for students interested in cutting-edge careers, or who want
to prepare for advanced study through the PhD. This degree incorporates additional advanced course work and on-campus creative activities that allow students to expand their knowledge in electrical and computer engineering, while including depth in one or more advanced areas.

The Doctor of Philosophy degree is designed to prepare students for high-level research and development positions in academia industry and government and for the teaching profession in engineering. This degree is distinguished by an emphasis on research, as documented in the doctoral dissertation.

Students may select course work and participate in research and design projects in the following areas:

- communication systems and networks;
- control systems;
- computer architecture and arithmetic;
- electromagnetics;
- microsystems;
- photonics and electro-optics;
- digital signal, image, and video processing;
- very large scale integration (VLSI);
- energy and power;
- bioengineering.

Students may also select a multidisciplinary program that crosses departmental lines and emphasizes the application of electrical and computer engineering to complex problems. These applications serve to promote the integration of engineering systems and technology with social, economic and environmental processes. Multidisciplinary opportunities exist in control systems and biomedical engineering.

Admission Requirements. Admission to the Graduate College, as described under “General Regulations” in the “Graduate College” section of the University Catalog, is the first step for those students proceeding toward advanced degrees. Graduation with high scholastic performance from an electrical engineering or computer engineering curriculum accredited by the ABET qualifies the student for admission to the School of Electrical and Computer Engineering. A recent GRE score is required as part of the application.

Graduates from non-engineering fields such as mathematics, physics and computer science are also admitted to the School of Electrical and Computer Engineering MS and PhD graduate programs if an evaluation of their transcripts indicates they are prepared to succeed in graduate-level course work in electrical and computer 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. The thesis option requires 24 credit hours of course work plus 6 credit hours for the thesis. If no thesis is written, 33 credit hours are required, including at least two hours that include an approved creative activity. Both programs require a plan of study that includes, at 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. The minimum of 18 hours of 5000-level courses in electrical and computer engineering is allowed only when a specific interdisciplinary plan of study is approved by the faculty. Each student is encouraged to include courses supporting disciplines such as mathematics, physics, computer science or other engineering fields. Additional remedial work in undergraduate electrical and computer engineering courses may be required in addition for students who do not have a sufficient background in electrical engineering.

The Doctor of Philosophy degree is granted to recognize high achievement in course work selected from the broad field of electrical and computer engineering and the ability to perform independent research in a chosen field of specialization that is of 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 several interdisciplinary degree programs. (See “Graduate Programs” under “Industrial Engineering and Management,” and “Telecommunications Management” in the “Graduate College” section of the Catalog.)

Master of Science in Engineering Technology Management

Terry Collins, PhD—Director
Brenda L. Johnson, M5—Assistant Director

OSU’s Master of Science in Engineering Technology Management is a rigorous degree program designed specifically for experienced engineers and scientists who are interested in accelerating their management careers. The curriculum combines academic coursework with the latest business practices and can be tailored to meet an individual student’s needs. Managing today’s global organizations requires a complex set of knowledge and skills. Effective planning, selection, implementation and management of technology, and the teams involved, is essential to the success of any business in today’s time-critical, global markets. OSU-MSETM students learn to apply proven evaluation concepts and implementation strategies to fast moving, technical management decisions that make the difference in both career and business success.

The MSETM program specifically addresses the real needs identified by industry leaders. The MSETM curriculum permits you to build a strong degree that directly addresses your needs and prepares you for the future. The degree consists of 32 credit hours. The MSETM program is provided by the OSU colleges of Engineering, Architecture and Technology; Arts and Sciences; and the Spears School of Business.

Admission Requirements. The guidelines for admission to the MSETM program are a bachelor’s or higher degree, in engineering or the physical/mathematical sciences, with a 3.00 GPA, and at least four years employment in a technical field since graduation with a bachelor’s degree. Applicants not meeting these standards may be granted provisional admission based upon their overall academic and professional practice history and accomplishments.

Both programs require a plan of study that includes, at a minimum, 18 hours of 5000-level courses, depending upon the background and specific interdisciplinary plan of study approved by the faculty. Each student is encouraged to include courses supporting disciplines such as mathematics, physics, computer science or other engineering fields. Additional remedial work in undergraduate electrical and computer engineering courses may be required in addition for students who do not have a sufficient background in electrical engineering.

Industrial Engineering and Management

Sunderesh Heragu, PhD—Professor and Head

Industrial engineering and management focuses on production systems that produce goods or provide services for customers. Industrial engineers define, design, build, operate, and improve production processes that convert resources to high quality products effectively, efficiently and safely.

People are the fundamental component of production systems. People provide the creativity and leadership essential to make things happen. Hence, industrial engineering is the most people-oriented discipline within the engineering family. Industrial engineers are trained to think in both broad and specific terms. Practicing industrial engineers understand business parameters as well as the physical and social parameters within production systems. This breadth allows industrial engineers to function effectively in a wide spectrum of activities ranging from strategic business planning to detailed task design. The wide-angle vision of industrial engineering provides career flexibility, leading to high-level leadership or specialized technical responsibilities.

Industrial engineers are found in manufacturing organizations (e.g., automotive, electronics, medical, and food manufacturers), service enterprises (e.g., hospitals, banks, airlines, and consulting groups), and governmental organizations (e.g., public service and regulatory organizations).

Vision

The School of Industrial Engineering and Management’s vision is to internationalize the impact of the School’s research, teaching, extension, and service. IEM’s vision is to place industrial engineers in a wide variety of industries including manufacturing, service, energy, healthcare, humanitarian, and others, so that our society at large can benefit from systems that efficiently produce goods or provide services, effectively use an optimal set of resources, and enrich the quality of life for all.

Mission

The School of Industrial Engineering and Management’s mission is to develop professionals and leaders in industrial engineering and management by being a leader in education, research, and outreach.

Core Values

Faculty, students, and staff work together to build and maintain a learning/mentoring environment where:

- Innovative practices are developed, tested, and validated.
- Knowledge and practices are shared.
- Each individual develops to his/her full potential.
- Professional ethics are practiced at all times.

Educational Objectives and Outcomes. Within a few years after graduation, Industrial Engineering program graduates will become professionals, managers or leaders in a wide variety of industries and apply discovery, problem solving, leadership, and management skills for the benefit of their organization and society at large.

Student Learning Outcomes. Graduating baccalaureate students possess an understanding of fundamental industrial engineering and management concepts, methodologies and technologies as demonstrated by:

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College of Engineering, Architecture and Technology

- admission to the Graduate College is required. OSU is currently offering only a graduate 
  admission to either the Master of Science or Doctor of Philosophy degree. The Master of Science degree is 
  program is designed to prepare students for professional practice that may 
  specialization in a particular field of study (beyond a BS degree). This degree 
  leading to the Master of Science Industrial Engineering and Management degree 
  internship and co-op experiences are offered to IEM students so that they can 
  Students are offered opportunities to enhance their classroom and laboratory 
  Communications skills are developed and practiced in written, oral and team 
  The means to define and design detailed solutions to address customer needs 
  Global and regional cultures are introduced in the sophomore year, and 
  The curriculum consists of three primary parts: (1) general studies, (2) core 
  Each IEM student, along with the faculty adviser, develops an individual 
  the broad education necessary to understand the impact of engineering 
  management and leadership, production control, system simulation 
  A capstone design experience, working with a real- 
  World and global issues are introduced and reinforced throughout 
  The means to define and design detailed solutions to address customer needs 
  Students are offered opportunities to enhance their classroom and laboratory 
  Students are offered opportunities to enhance their classroom and laboratory 
  The Master of Science degree in industrial engineering 
  The Doctor of Philosophy degree requires the completion of at least 90 credit hours beyond the bachelor’s degree, including a research thesis of six credit hours. A 12 credit-hour credit-hour option is also permitted and must include a three credit- 
  The Doctor of Philosophy degree requires the completion of at least 90 credit hours beyond the bachelor’s degree, including a minimum of 18 credit hours of dissertation research and a minimum of 30 credit hours of course work beyond the master’s degree.

Materials Science and Engineering

Raj N. Singh, PhD—Williams Company Distinguished Chair, Professor and Head

The field of materials science and engineering is expanding into a period of unprecedented intellectual challenges, opportunities and growth. Products created using materials science and engineering research contribute to the economic strength and security of not only the state, but also the country.

The School of Materials Science and Engineering is located at OSU-Tulsa's Helmerich Research Center, a premier facility which places the College of Engineering, Architecture and Technology in a unique position to conduct world-class education, research and technology development and transfer in advanced materials of strategic importance to our nation. Current research programs focus on materials for energy technologies, bio-materials for medical technologies, advanced materials for aerospace and defense, and materials for electronics and control technologies.

Program Educational Objectives. OSU is currently offering only a graduate program in Materials Science and Engineering.

Graduate Programs.
The School of Materials Science and Engineering offers graduate programs leading to the Master of Science and Doctor of Philosophy. The Master of Science and Doctor of Philosophy programs have been approved. 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.

At the Helmerich Advanced Technology Research Center (HRC) at OSU, four research focus areas have been identified by industry leaders in and around Tulsa, with funding from the NSF/Engineering Research Centers program (ERC), including: Materials for Energy Technologies, Advanced Materials for Aerospace, and Materials for Electronics and Control Technologies.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from a materials science and
The mission of the School of Mechanical and Aerospace Engineering is to create a vibrant and stimulating learning and research environment and to instruct and encourage our students to reach their full potential in technical expertise, innovative expression, intellectual curiosity, and collaborative design.

MAE Mission for Undergraduate Instruction: The School of Mechanical and Aerospace Engineering will support the MAE and CEAT missions and the mechanical and aerospace engineering education to students that is grounded in engineering fundamentals. The Faculty of MAE are committed to preparing engineers who are:

• Competitive nation-wide and internationally for employment opportunities and who will become respected achievers within their discipline.
• Well prepared for the pursuit of advanced studies at any university.
• Prepared for a lifetime of continuing development, which is demanded by discipline-involved with rapidly progressing technology.

Rigor: The GPA requirements for MAE professional school admission and the degree requirements for graduation are the highest in CEAT (see Departmental GPA Requirements, Item 1). This is essential to fulfill the MAE Mission for Undergraduate Instruction.

Program Educational Objectives: Program educational objectives are statements that describe accomplished learning for graduates of the School of Mechanical and Aerospace Engineering.

1. Develop exemplary careers and become leaders to the greater benefit of society.
2. Earn a reputation as responsible and ethical professionals.
3. Develop innovative technologies and adapt to changing professional and societal norms with wisdom and integrity.

Student Outcomes and Specific Program Criteria. The student outcomes for students graduating from the mechanical and aerospace engineering BS programs include: (a) an ability to apply knowledge of mathematics and science; engineering knowledge; (b) an ability to design and conduct experiments, as well as to analyze and interpret data; (c) an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability; (d) an ability to function on multidisciplinary teams; (e) an ability to identify, formulate, and solve engineering problems; (f) an understanding of professional and ethical responsibility; (g) an ability to communicate effectively; (h) an ability to broadly understand the impact of engineering solutions in a global, economic, environmental, and societal context; (i) a recognition of the need for, and an ability to engage in, life-long learning; (j) a knowledge of contemporary issues; (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice; (l) reasoning that is specific program criteria which must be satisfied by the curricula and are unique to engineering disciplines. For the BSME Program, the specific ME program criteria are broken into three elements. The ME curriculum prepares graduates to: ME1—demonstrate an ability to apply principles of engineering, basic science and mathematics (including multivariate calculus and differential equations); ME2—demonstrate an ability to model, analyze, design, and realize physical systems, components or processes; and ME3—be prepared to work professionally in either thermal or mechanical systems areas while taking courses in each area. For the BSAE Program, the specific AE program criteria are also broken into three elements. The AE curriculum prepares graduates with: AE1—knowledge of the following aeronautical topics: aerodynamics, aerospace materials, structures, propulsion, flight mechanics, and stability and control; AE2—knowledge of some of the following aeronautical topics: orbital mechanics, space environment, attitude determination and control, telecommunications, space structures, and rocket propulsion; and AE3—graduates must have design competence which includes integration of aeronautical or astronautical topics. Because mechanical engineering is perhaps the broadest and deepest 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. In this selection, no one area may be undue emphasized at the expense of another. For the mechanical and aerospace engineering, biomedical engineering, and premedical programs, prescribed course work provides students with more focused development. Graduates are fully competent as mechanical or aerospace engineers, with abilities in design, and in-depth knowledge in their areas of concentration.

As a fundamental component of all BS programs, engineering design is strongly emphasized in the junior and senior years but is integrated throughout the curriculum. Most MAE courses at the 3000 and 4000 levels include some design content, ranging from a minimum of one-half to a maximum of four credit hours of design content. Each professional school course builds upon the preceding
School of Architecture
Randy Seitsinger, MArch, AIA—Professor and Head

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 among the most respected. Students encounter an accelerated approach to 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 program moved into a brand new facility, the Donald W. Reynolds School of Architecture Building in 2009, and at the same time celebrated its centennial as a School of Architecture.

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 and a minor in Architectural History/Theory, Architecture and Entrepreneurship, or minors available across OSU.

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, and 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.

Architectural education is 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 share, of traits normally considered less than compatible: human empathy, artistic creativity, technical 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 as well. It must, in a sense, insolubly combine opposites: the rational and subjective, the scientific and humane.

The School of Architecture endeavors to instill in each individual sensitivity to and architectural engineering. 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 share, of traits normally considered less than compatible: human empathy, artistic creativity, technical 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 as well. It must, in a sense, insolubly combine opposites: the rational and subjective, the scientific and humane.

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 only 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, BArch, is accredited by the NAAB. The Bachelor of Architectural Engineering degree, BArchE, is accredited by the Accreditation Board for Engineering and Technology (ABET http://www.abet.org) as an engineering program. Both programs require a minimum of five years of study to complete. In the United States, most registration boards require as a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with regional accreditation. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with regional accreditation. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with regional accreditation. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with regional accreditation. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with regional accreditation. The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U.S. professional degree programs in architecture offered by institutions with regional accreditation.

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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. A curriculum consists of 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 to educate future leaders within the architecture profession. In the pre-professional portion of the curriculum (approximately two years of study), the focus is on the fundamental principles of design and technology supplemented by appropriate general education courses in English, social sciences and humanities. These courses allow students to assimilate a beginning knowledge base in architecture along with a broader liberal based component to their education. Students who demonstrate the ability to identify and solve meaningful architectural engineering problems. The course work is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. This course work includes socializing students to technical-related technical problems and their responsibilities as architects and engineers to behave ethically and protect public safety. The program culminates in a fifth year course in which the students integrate analysis, synthesis and other abilities they have developed throughout the earlier portions of their study to complete a capstone design project.

An integral part of this educational continuum from basic knowledge through comprehensive architectural engineering design is learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. Students are exposed to a wide variety of problems dealing with contemporary issues in an international context. Moreover, the program provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational and CAD tools are introduced and used as a part of the students' problem-solving experiences. Finally, the students' experiences in solving ever-more-challenging problems gives them the ability to continue to learn independently throughout their professional careers.

Architectural Engineering Educational Objectives. The educational objectives expected of program graduates a few years after graduation are as follows: Those graduates...
Applicants wishing to enter into the Professional School in both Students wishing to transfer into the Professional School of Application for admission, readmission or Applicants not admitted may reapply for admission to the All students applying. Changing programs, Architecture to Architectural Engineering or vice versa, typically occurs via formal application and admission to the other program through the Professional School application and admission process. Taking ARCH Prefix Courses When Not Admitted to Professional School. Students not admitted to the Professional Schools may not enroll in any 3000 level or higher ARCH prefix course or ARCH 2203 without prior permission of the instructor and Academic Advisor. Transfer Students. Students wishing to transfer into the Professional School of the OSU School of Architecture must apply for admission to the Professional School in the same manner as OSU students. Completion of Required Pre-Professional School Courses. All students applying for admission to Professional School must satisfactorily complete all required courses for consideration by the end of the spring semester of the year of application. Application and Notification Dates. Application for admission, readmission or transfer to the Professional School of Architecture and Architectural Engineering must be made by the last working day of April of the year of intended admission. Notification of selection decisions will normally be made soon after June 1st but not before a two week period after Grade Reports have been received by the School – if there should be ANY problem with a grade that may impact acceptance to the Professional Schools the student should contact the School immediately. Selected applicants must confirm acceptance of the offer of a position in the Professional School by the date indicated in the letter of offer. Reaplication. Applicants not admitted may reapply for admission to the Professional School the following year; such applicants do not carry any priority or disadvantage but are included in the full application pool. Division of Engineering Technology Gouranga Banik, PhD, PE, PMP, FASCE: Professor and Head Engineering technology education is concerned with the real-world application of engineering achievement with emphasis on 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 engineering technologist. Often the technologist will be expected to implement what the engineer conceives. Curricula. 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/or applied engineers" and are trained either to assist engineers or to provide independent support for engineering activities. The graduate 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, engineer, designer, and production 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 Division of Engineering Technology is offering opportunities for its students to minor in entrepreneurship. Usually, students will take two or three additional classes to get a minor in addition to his/her degree. 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.
Bachelor of Science in Engineering Technology Degree Programs
1. Communication, social sciences, and humanities—history, government, religion, literature, art, music.
2. Engineering and technical electives—controlled and general.

Construction Management Technology

The construction industry is the largest industry in the world. Leadership in this field requires a broad knowledge of labor, materials and equipment, capital and construction procedures. The interdisciplinary approach of the construction management technology program offers the student specialized coursework in all phases of construction, designed to prepare him or her for responsible positions in industry.

The primary goal of the Department of Construction Management Technology (CMT) 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.

Program Educational Objectives. OSU Construction Management Technology graduates a few years after graduation will:
1. Solve problems typically found in the construction industry in construction engineering design, estimating, planning, scheduling and project management using mathematical, analytical, and scientific skills of engineering technology.
2. Successfully work in teams and communicate effectively in written, oral and graphical forms.
3. Continue life-long career and professional growth by actively interacting with local industries and participating in appropriate professional societies.

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.

These needs and opportunities for service are assessed regularly through close cooperation with local and regional construction professionals and industry associations. An active Construction Management Advisory Board, representing a broad cross-section of the industry, meets regularly to offer support and guidance necessary to preserve uncompromising excellence.

The Construction Management Technology program is accredited by the Engineering Technology Accreditation Commission of ABET. The educational objectives of the Department of Construction Management Technology are consistent with those required by ETAC of ABET and are listed under "Division of Engineering Technology" in the Catalog.

Undergraduate Admission. Students who satisfy the University admission requirements are eligible to enroll for the first two years of the program in the lower division of the curriculum for construction management technology. In order to maintain the number of students in the CMT upper division, an available CMT resources, advancement to the CMT upper division is by application. Applications are due to the CMT Department no later than the last working day of April each year. To be eligible for program advancement, lower division students must have:
1. Completed 60 credit hours of course work counting toward the CMT degree.
2. Completed all of the required (shaded) courses in the Degree Requirement Sheet (these courses are also listed on the Calculation Work Sheet of the Application to Upper Division form).
3. Achieved a grade of 'C' or better in the following courses: CMT 1214, 2253, 2263, ACCT 2103, PHYS 1214, GENT 2323, MATH 2123, and CMT 2343. A substitution for any of these courses must meet the same 'C' requirement.
4. Achieved a minimum Selection GPA (SGPA) of 3.05.

Annually, students who meet these criteria for program advancement and have made a timely application for admission to the upper division will be admitted to the upper division of the CMT curriculum. The Selection Grade Point Average (SGPA) is a weighted GPA based on specified lower division courses which have proven to be good indicators of student success in the program. For consideration of admission to the upper division of the Construction Management Technology program, the following courses and multipliers will be used in calculating SGPA's: CMT 2343 (x3 multiplier), CMT 2263 (x3 multiplier), GENT 2323 (x3 multiplier), CMT 2253 (x2 multiplier), MATH 2123 (x2 multiplier), PHYS 1114 (x2 multiplier), PHYS 2713 (x2 multiplier), ENGL 1113 (x2 multiplier), PHYS 1214 (x1 multiplier), MATH 2133 (x1 multiplier), EET 1003 (x1 multiplier) and ACCT 2103 (x1 multiplier). Additional detailed information concerning admission to the upper division may be obtained directly from the CMT department.

Transfer students are required to furnish transcripts and course descriptions for previous classroom courses, as well as examples of previous academic work. Evaluation and enrollment by the CMT department is on a course-by-course basis for all transfer students.

The modern constructor must have a great deal of technical knowledge to keep abreast of rapidly changing equipment, 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 the 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 management technology. Special attention is given to computer applications in construction estimating, and the development of graphic, written and oral communication skills is emphasized throughout the curriculum.

Students with an interest in building structures may select courses in the "building" option of the construction management technology curriculum, which provides them with 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 the construction management technology curriculum, which provides them with 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 technology 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 technology 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, and construction managers at all levels.

Electrical Engineering Technology

Imad Abouzahr, PhD, PE—Associate Professor and Program Coordinator

The electrical engineering technology (EET) curriculum provides preparation for outstanding career opportunities not only in the electronics industry itself, but also in many other areas in modern industry that depend upon electronics for control, communications or computation. Outstanding opportunities exist for
graduates to work in diverse areas of electronics and computers. The work of an electrical engineering technology graduate may range from assisting in the design and development of new equipment in the laboratory, applying modern microprocessors in the field, to the operation or supervision of production operations or field representatives.

The program offers the Bachelor of Science in Engineering Technology degree with a major in Electrical Engineering Technology. An option in computers is also available. To meet diverse needs, the program is laboratory-oriented and provides a strong foundation of specialized mathematics and science courses in applied electrical engineering and related technical areas, as well as courses in the area of communications, humanities, and the social sciences.

Program Educational Objectives. OSU Electrical Engineering Technology graduates a few years after graduation will:

- Be employed in a technical or management position where the skills and knowledge of applied electrical engineering are utilized.
- Continue life-long learning and professional growth through participation and membership in professional organizations and/or through the continuation of professional studies.
- Work proactively and productively in teams and communicate effectively in written, oral and graphical forms.
- Successfully apply mathematical, analytical and technical expertise to industrial problems.

The electrical engineering technology graduates can expect to obtain these objectives because at the time of graduation they will have:

- an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
- an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
- an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
- an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
- an ability to function effectively as a member or leader on a technical team;
- an ability to identify, analyze, and solve broadly-defined engineering technology problems;
- an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- an understanding of the need for and an ability to engage in self-directed continuing professional development;
- an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
- a knowledge of the impact of engineering technology solutions in a societal and global context;
- a commitment to quality, timelines, and continuous improvement;
- should have knowledge and hands-on competence in the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems;
- the applications of physics or chemistry to electrical/electronic(s) circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry;
- the ability to analyze, design, and implement control systems, instrumentation systems, communications systems, computer systems, or power systems;
- the ability to apply project management techniques to electrical/electronic(s) systems, and
- the ability to utilize statistics/probability, transform methods, discrete mathematics, or applied differential equations in support of electrical/electronic(s) systems.

The Electrical Engineering Technology major provides graduates the ability to enter the many dynamic fields of the electrical engineering world. The demand for graduates having electronic and electrical engineering design and application skills remains important and relevant. Graduates of this program will be prepared for a wide range of opportunities for employment in an industry that requires considerable knowledge of the electrical engineering profession.

The Electrical Engineering Technology—Computer option curriculum provides the preparation for graduates to enter the growing field of computer hardware and software engineering. The demand for graduates having both computer hardware and software skills is quickly developing as the importance of automation, robotics, and artificial intelligence is recognized. Graduates of this program will be prepared for these opportunities in industry that require considerable knowledge of both computer hardware and software engineering skills.


Fire Protection and Safety Engineering Technology
Qingsheng Wang, PhD, PE, CSP—Dale F. Janes Endowed Associate Professor and Program Coordinator

The fire protection and safety engineering technology (FPST) curriculum provides preparation for assessing and reducing the loss potential with respect to fire, safety, industrial hygiene, and hazardous material incidents. With respect to fire, reducing the loss potential might involve setting design criteria with a 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, or 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, and the development of procedures to address practical approaches to compliance with state and federal regulations. Addressing the problems of handling and disposing of hazardous chemicals, such as spill control, is often required. Managing risk and compliance with federal laws and regulations relative to occupational safety and health and hazardous materials is an increasingly important job activity.

The fire protection and safety engineering technology program began at Oklahoma State University in 1937 - which is the oldest fire related program in North America. The demand by business and industry for loss control specialists has resulted in the evolution of the program into one that now places emphasis on fire protection, safety, and occupational/environmental health. The FPST program prepares graduates for careers in loss control. The loss control profession is segmented into three major areas: loss from fire, loss from physical accidents, and loss from environmental exposure.

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 program concludes with the Bachelor of Science in Engineering Technology degree in Fire Protection and Safety Engineering Technology.

Program Educational Objectives. OSU Fire Protection and Safety graduates a few years after graduation will:

1. Earning and pursuing personal, technical and professional advancement through their employment;
2. Continuing the pursuit of life-long learning through membership and participation in professional organizations;
3. Developing business expertise within their selected employment organization;
4. Successfully applying mathematical, analytical, and technical skills to solve complex problems in the selected field;
5. Meeting the highest standards of ethical practice in their profession.

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 engineering technology program.


Mechanical Engineering Technology
Richard A. Beier, PhD, PE—Professor and Program Coordinator

Mechanical engineering technology (MET) is the component of engineering that specializes in design and application. MET includes the broad areas of mechanical design, mechanical power and manufacturing. Mechanical engineering technology is applied in robotics, automotive manufacturing, computer-aided drafting and design, computer-aided manufacturing, agricultural machinery and processing, mining, shipbuilding, spacecraft, electronics manufacturing, food processing, aircraft metals and plastics production—nearly the entire spectrum of the industry. In the power areas, MET graduates are involved in water power cycles, gas power cycles, air conditioning, fluid power and power transmission. Manufacturing areas involving MET graduates include tool design, cost evaluation and control, plant operations, production planning and manufacturing methods.

An important element in MET is the use of laboratory experience as a teaching
tool. The MET program has laboratories in fluid power, materials, fluid mechanics and applied thermal sciences, basic instrumentation, computer-aided design (CAD), and manufacturing. A senior capstone design course, composed of student teams, integrates the knowledge and skills learned during their course of study. Laboratories are equipped with the latest computer software that supports the design function. Where appropriate, laboratories with modern computer data acquisition systems and on-screen displays are available.

In addition to the required mechanical engineering technology courses, students are provided a solid foundation in algebra, trigonometry and calculus, physics, chemistry, statics, dynamics, instrumentation, thermodynamics and computer science.

Program Educational Objectives. OSU Mechanical Engineering Technology graduates a few years after graduation will:

1. Be employed in a technical or management position where the skills and knowledge of mechanical engineering technology are utilized.
2. Successfully apply mathematical, analytical, and technical skills to industrial problems, which may include the areas of design, manufacturing, graphical communications, and fluid power.
3. Within your employment environment, work proactively and productively as both members and leaders of teams.
4. Within your employment organization, communicate effectively in written, oral and graphical form.
5. Continue life-long learning by bringing new technology into their workplace, through participation and membership in professional organizations and/or through the continuation of professional studies.

Preparation for a specific industrial function is accomplished by selecting courses that emphasize a given design area, such as fluid power, mechanical design, computer-aided design (CAD) power generation, and air conditioning and heating. Because the program focuses on the application of engineering principles to the pragmatic solution of problems, graduates are immediately productive with minimal on-the-job training, thus increasing their value to industry. Graduates of the MET program are prepared to function in the areas of product design, testing and evaluation; product application and maintenance field engineering; and technical sales and liaison. Industries employing MET graduates include manufacturing companies of all types (aircraft, automobile, compressor and turbine, fluid power manufacturers and others); energy companies (such as natural gas, electrical power generation, and the oil and gas industries); and service companies (transportation industry, architecture and professional engineering firms, and those supporting the oil and gas industry).

Companies utilizing the talents of MET graduates are diversified in their products, as well as geographical location, thus providing a variety of choices in respect to both type of work and place of residence and in diverse industrial, governmental and educational institutions.

College of Human Sciences

College Administration
Stephan M. Wilson, PhD, EFLE—Dean
Jorge Atiles, PhD—Associate Dean for Extension and Engagement
Christine Johnson, PhD—Associate Dean for Research and Graduate Studies
Shiretta Owneby, PhD—Associate Dean for Academic Programs and Services
Ben Goh, EdD—Assistant Dean and Director, School of Hotel and Restaurant Administration

Campus Address and Phone:
101 Human Sciences, Stillwater, OK 74078
405.744.5053
Website: humansciences.okstate.edu

Mission
The College of Human Sciences advances and applies knowledge while developing effective professionals, engaged citizens and visionary leaders who promote the physical, social and economic well-being of people.

Vision
The College of Human Sciences will be a world leader in the discovery and application of knowledge, preparing the next and upcoming generations of professionals to improve the quality of life.

The College of Human Sciences (COHS) is composed of three departments—Design, Housing and Merchandising; Human Development and Family Science; 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, design, education, international service, research, social welfare and a variety of agencies, organizations and institutions. Pre-professional options and advisement are offered for students interested in pursuing graduate education in law, medicine and allied health fields, as well as within their major fields of study.

Core Values
Excellence - We are committed to excellence and continuous improvement in all our endeavors.
Integrity - We are committed to the principles of truth and honesty; we will be accountable and ethical in all our professional and personal actions.
Service - We believe that serving others is a noble and worthy endeavor.
Intelectual Freedom - We believe in the freedom of speech and in the right to question and challenge in an environment that respects the rights of all to freely pursue knowledge.
Diversity - We respect others and value diversity of opinion, freedom of expression, and other ethnic and cultural backgrounds.
Stewardship of Resources - We are dedicated to the efficient and effective use of resources. We accept responsibility of the public’s trust and are accountable for our actions.
Creativity - We foster creativity and innovation utilizing world-class facilities and leading technologies to attract and support prestige faculty and competitive graduates.

Further information may be found at humansciences.okstate.edu.

Accreditation
The Council for Interior Design Accreditation (CIDA) has accredited the undergraduate interior design program. The preproduction and the production management apparel curricula is endorsed by the American Apparel and Footwear Association (AAFA) Education Foundation, making it one of only 13 approved programs in North America. The Child Development Laboratory-RISE is licensed by the Oklahoma Department of Human Services (DHS) and has received a Three Star Differential Quality Certification. The Child Development Laboratory-RISE is also accredited by the National Association for the Education of Young Children (NAEYC). Program approval has been granted to the Early Childhood Education Teacher Preparation program by the Oklahoma State Board of Education. In addition, the Early Childhood Education program is accredited by the Council for Accreditation of Educator Preparation (CAEP). The Fashion and Consumer Sciences Education program has been accredited by the Oklahoma Commission for Teacher Preparation in cooperation with the Council for Accreditation of Educator Preparation (CAEP). The Marriage and Family Therapy program is accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE). The Didactic Program in Dietetics and the Dietetic Internship at OSU are both currently granted continuing accreditation by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995, ph. 312.899.0040 ext 5400.

The Patricia Kain Knaub Center for Student Success
The Patricia Kain Knaub Center for Student Success is located in 101 Human Sciences on the south wing of the Human Sciences building. This location is the destination of every student and accompanying family arriving in the College. The Center provides a welcoming entry point and a continuing resource for a wealth of integrated academic programming and student services. A student interested in learning about the College of Human Sciences and its academic programs may schedule an appointment with the Coordinator for Prospective Student Services for information and a tour of the College facilities. Upon admission to the College of Human Sciences, students receive an array of services within the Center.

The Center for Student Success serves as a leader within the OSU system and to human sciences academic units nationally to elevate academic advising, the first-year experience, leadership development, and career development through highly engaging, purposeful and integrated programming that educates students to become intentional learners.

The Center offers the following comprehensive and integrated services to undergraduate students in the College of Human Sciences:
• Services to prospective students and their families that clearly articulate College of Human Sciences academic programs.
• Developmental academic advising, emphasizing a student-centered, holistic approach.
• A foundational first-year experience to facilitate transition of students to a large university.
• Strong leadership development experiences through the first-year experience courses, Freshman Scholar Leaders, Student Council, Ambassadors, and other student leadership organizations.
• Career development opportunities to effectively link educational experiences with career goals and career destinations.

The Career Consultant within the Center for Student Success is a certified Global Career Development Facilitator (GCDF) and provides services designed specifically for College of Human Sciences students. The College of Human Sciences Career Services offers students opportunities to explore traditional and nontraditional careers, complete career-related assessments, and enhance their professional presence in writing, in person and online.

Career development projects are integrated into the first-year experience courses required of all freshmen and transfer students. Outside of the classroom, students are provided opportunities to refine their job search materials, interview with practicing professionals who represent Human Sciences fields of study, participate in career empowerment workshops, learn of part-time job opportunities related to Human Sciences areas of study and identify internship experiences. The College of Human Sciences Career Services provides a link to OSU Career Services, making students aware of resources available throughout campus, including career fairs, career and skill assessments, on-campus interviews and an array of other valuable opportunities. The College of Human Sciences Career Services has an online presence via our website and through participation in several major-specific LinkedIn groups. In addition, we utilize Twitter to share information about upcoming events and opportunities.

Human Sciences Outreach
The College of Human Sciences Outreach office performs a vital role in the academic programs and services mission within the College, providing support services for courses using a variety of delivery methods to serve diverse student needs. Various types of international study programs are offered to engage students in international opportunities and education. In addition, courses that take students to various locations to experience hands-on education are offered through Outreach. Web-based courses and other distance delivery methods serve students who are unable to access traditional educational offerings.
As a member of the Great Plains Interactive Distance Education Alliance, the College of Human Sciences Outreach office provides support services for online master’s programs in family financial planning, family and community services, gerontology, retail merchandising leadership and dietetics. Consistent with the missions of OSU and the College of Human Sciences, Outreach serves state, national and international audiences.

2016-2017 University Catalog
Honors
Outstanding students in the College of Human Sciences who meet the requirements of The Honors College may earn the Honors College Degree while completing their undergraduate degree in this college. College honors are earned at the upper division (3000- and 4000-level classes) in the student’s major and are one of the requirements for receiving a bachelor’s degree with honors. College honors requires nine hours of upper-division honors credit in the department and three hours of honors thesis or creative component. For further information on the Honors College, refer to https://honors.okstate.edu/content/awards or visit the Honors College in 101 Old Central.

Scholarships
Oklahoma State University has a scholarship program for entering freshmen and first-year transfer students. College of Human Sciences scholarship applications are typically due February 1 for consideration for fall admission and August 1 for consideration for spring admission. Scholarships are announced in April for the coming academic year. Freshmen and first-year transfer student scholarships are awarded during the fall and spring semester to students entering Human Sciences in the following fall semester. Criteria for and the amount of the scholarship awards vary.

Academic Programs
Undergraduate Programs. The Bachelor of Science degrees within the College of Human Sciences are offered by three departments and one school. The majors are:

- Design, Housing and Merchandising (DHM), with options in apparel design and production, interior design and merchandising.
- Human Development and Family Science (HDFS), with options in early childhood education, child and family services, and family and consumer sciences education.
- Hotel and Restaurant Administration (HRAD).

- Nutritional Sciences (NSCI), with options in allied health, community nutrition, dietetics, and human nutrition/premedical sciences.

Subject-focused minors are available through three departments within the College of Human Sciences. Details regarding these minors may be obtained by contacting the appropriate programs.

Transfer Student Admission Requirements. Students transferring into the College of Human Sciences from another institution or another college at OSU must have a minimum retention GPA as determined by the academic unit. See DHM, HDFS and NSCI transfer admission requirements on degree requirement sheets for details.

Master's Programs. The Master of Science degree is available in design, housing and merchandising; hospitality administration; human development and family science and nutritional sciences.

Students seeking admission to a master’s degree program in any of the departments/schools must be qualified graduates of colleges and universities of recognized standing. In addition, those seeking admission must have completed 30 semester credit hours in human sciences or closely related subject matter. A student with background deficiencies must compensate for such deficiencies before admission to the master’s program. Graduate Record Examination (GRE) scores are required by master’s programs within the HDFS and NSCI departments with the exception of online master’s programs offered by these departments. The Department of DHM and the School of HRAD require submission of GRE GMAT scores for admission consideration. The plan of study for a master’s degree student is individually planned to develop academic excellence specific to the student’s career goals. Refer to descriptions of specific master’s degree programs for each department or school. 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.

Online Master's Programs. The Master of Science degree in family financial planning (FFP) is offered collaboratively online through the Great Plains Interactive Distance Education Alliance (Great Plains IDEA), of which OSU is a member. The FFP master’s curriculum is approved by the Financial Planner Board of Standards and requires 36 credit hours and the graduate certificate requires 18 credit hours, preparing students to take the Certified Financial Planner (CFP) examination.

The Human Development and Family Science master’s program, with an option in gerontology, is offered through the College of Human Sciences. The online version of the program requires 36 credit hours and the graduate certificate requires 12 credit hours. In addition, an online option is offered in Family and Consumer Sciences and requires 36 credit hours. An online master’s program in dietetics is offered through the Department of Nutritional Sciences and the Great Plains IDEA. Students admitted to this program must hold the Registered Dietitian (RD) credential or must have met both the academic and supervised practice requirements of the Academy of Nutrition and Dietetics and be ready to sit for the national credentialing exam to become a Registered Dietitian. The program requires 36 credit hours.

The Department of Design, Housing and Merchandising offers an online Retail Merchandising Leadership online master’s program through the Great Plains Interactive Distance Education Alliance and requires 36 credit hours.

Doctoral Program. The Doctor of Philosophy degree is a multidisciplinary degree program through the College in conjunction with the departments of Design, Housing and Merchandising, Human Development and Family Science, and the School of Hotel and Restaurant Administration. There is a separate graduate program in Nutritional Sciences. Individualized programs lead to an area of specialization in any one of the departments/school. Admission to the programs is based upon evidence that the applicant meets general requirements of the Graduate College, has demonstrated academic and professional achievements, and can successfully complete a doctoral program, as evidenced by prior academic work, minimum 3.25 GPA in graduate level course work, letters of recommendation, a statement of purpose and goals, and GRE or GMAT scores. Applications are reviewed by a graduate faculty committee in each department/school. The programs offer a combination of courses and research experiences. The programs include a strong emphasis on research and application of statistical procedures, as well as having students gain experiences in resource generation, knowledge sharing and community engagement.

A minimum of 60 semester credit hours beyond the master’s degree is required for the PhD degrees. The PhD degrees prepare individuals to be researchers and educators for research positions in universities, business and industry, for university teaching and for administrative or management level positions.

Human Development and Family Science and Nutritional Sciences additionally offer a 90 semester credit hour PhD program which incorporates the requirements to achieve both a Master of Science degree and a Doctor of Philosophy degree. Students accepted into the 90-hour PhD option will complete requirements in the first 30 credit hours for either a MS degree in Human Development and Family Science (Developmental and Family Sciences option) or in Nutritional Sciences (thesis option).

Departmental Clubs and Honor Societies
American Association of Textile Chemists and Colorists
American Hotel and Lodging Association (student chapter)
American Society of Interior Designers Student Chapter
Club Manager’s Association of America
Early Childhood Education Club
Eta Sigma Delta (hotel and restaurant administration honor society)
Graduate Students in Human Sciences Association
Graduate Students in Nutritional Sciences
Hospitality Administration Graduate Student Association
Human Development and Family Science Club
Human Sciences Ambassadors
Human Sciences Scholar Leaders
Human Sciences Student Council
International Facility Management Association Student Chapter
International Interior Design Association Student Chapter
Meeting Professionals International
Merchandising and Apparel Design Association
National Society of Minorities in Hospitality
Nutritional Sciences Club
OSU Student Restaurant Association
Phi Upsilon Omicron (scholarship and leadership honor society)
Sigma Phi Omega (gerontology honor society)
Student Restaurant Association
U.S. Green Building Council

Design, Housing and Merchandising
Jane Swinney, Ph.D.—Associate Professor and Head

The mission of the Department of Design, Housing and Merchandising (DHM) is to be recognized leaders in Technology and Sustainable Design in partnership with industry and community. Three undergraduate options are available: apparel design and production, interior design, and merchandising each requiring a summer internship between the junior and senior years. Students in apparel design and production are preparing for careers in the apparel and sewn products industries. The program emphasizes the integration of design principles, construction methods, consumer preferences and mass production strategies. Core coursework includes principles of design, anthropometrics and pattern grading, apparel assembly and production, draping techniques, methods of mass production, quality assurance, properties and performance evaluation of textiles, patternmaking, computer-aided design and technology, entrepreneurship, and a required internship to acquire international design industry experience. The American Apparel and Footwear Association (AAFA) Education Foundation has endorsed the undergraduate curricula, making OSU one of only 13 schools in North America recognized with an AAFA-approved apparel program. Career opportunities include apparel designer, technical designer, product development manager, accessory designer, patternmaker, textile designer, sourcing manager, quality assurance manager, production manager and apparel engineer.

Students in interior design are preparing for careers as professionals who assist businesses and families in planning and solving problems relative to the function and quality of interior living and working environments. Course work includes fundamentals of design, design analysis, ergonomics, concept development,
space planning and programming, design of interior space, computer-aided design (CAD) and related aspects of environmental design. Students must pass the Proficiency Review Process at the end of their freshman year to be accepted into the professional level interior design program. Upon acceptance, students are expected to have their own laptop computer with sufficient capacity for graphics software used in the professional program. Opportunities include professional practice in interior design and architectural firms, lighting design, facility management, historic restoration and preservation and product design and sales. The undergraduate interior design program is accredited by the Council for Interior Design Accreditation (CIDA) and the program has achieved national ranking by the publication Design Intelligence.

The merchandising program prepares students for careers at every level of the fashion industry: trend forecasting, textile sales, wholesaling product lines to retailers, retail buyers, managers, visual merchandisers as well as auxiliary industries including fashion journalism, event planning, and logistics. Course work includes retailing, merchandise planning and analysis, sustainable design, profitable merchandising analysis, visual merchandising and communication, market analysis, quality assurance, retail technology and global sourcing. Merchandising graduates are in high demand among retailers, manufacturers, product developers, supply chain and sourcing managers, and designers.

Students in all three options will develop business management, communication, creative problem solving and administrative skills. Minors are available in merchandising and apparel design and production.

Admission Requirements. Transfer students must meet the following minimum requirements in GPA requirements in order to be admitted to the DHM undergraduate program:

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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 Sciences with an option in design, housing and merchandising. The graduate programs are scientifically based research and/or design oriented. Graduate degrees in the department are tailored to departmental areas of expertise, professional goals of the candidate and College of Human Sciences and Graduate College requirements. Graduate programs may focus on either merchandising or design. Students may investigate design and merchandising from the following areas: 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 awarded in four options – Apparel Design and Production, Interior Design, Merchandising, and Retail Merchandising Leadership (offered online through the Great Plains Interactive Distance Education Alliance) – and is designed to prepare individuals for careers in business, industry, extension and post-secondary or college teaching. The thesis plan (research or design) is available for students in apparel design and interior design. For merchandising master’s students, research thesis and course work only options are available. For retail merchandising leadership master students a non-thesis creative component is required. Programs of study are built upon 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. A minimum of 21 credit hours must be taken in the department. Additional courses may be selected from other areas of human sciences or from supporting areas such as marketing, sociology, history, and physiology. If the undergraduate degree is not in the area of specialization, specific undergraduate courses in design, housing and merchandising will be required as prerequisites.

The Doctor of Philosophy Degree. The PhD prepares individuals for research positions in universities, business and industry, for university teaching and for administrative or management level positions. A candidate for the Ph.D. 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 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 and merchandising including synthesis of knowledge drawn from departments within and outside of human sciences. Emphasis is on attainment of competencies rather than on the completion of specific numbers of credits; however, a minimum of 60 credit hours beyond the master’s degree must be completed. Each student will develop competence in the area of specialization which includes courses in the major and the support area. International and management dimensions are included.

The program includes a strong emphasis on research and application of statistical procedures, as well as having students gain experience in resource generation, knowledge sharing, and community engagement.

More detailed information on graduate study in the Department of Design, Housing and Merchandising can be obtained from the department website humansciences.okstate.edu/dhm or by writing the head of the department.

Hotel and Restaurant Administration

Ben Goh, Ed.D.—Assistant Dean and Director, Charles W. Lanphere Professor

The mission of the School of Hotel and Restaurant Administration (HRAD) is to be a leader in hospitality education through purposeful research, superior teaching and innovative experiential learning to enhance the lives of those we serve.

Our focus:
- High quality academic foundation centered on a focused and relevant curriculum with the integration of research and engagement
- Diverse experiential learning labs that are operated professionally and ethically using sound business principles
- Student organizations which actively partner with national and international hospitality professional associations
- Signature events that provide experiential learning for students and their peers including special events and building communities while supporting the land grant university mission

A new educational facility opening fall 2016 unites technology with state-of-the-art laboratories, classrooms, exhibit areas and faculty offices. Specific additions and renovations include food preparation and foodservice equipment, dining room management and table service laboratory, quick service restaurant, basic food preparation laboratory, demonstration classroom and the Hirst Center for Beverage Education. The Hirst Center for Beverage Education will accommodate a curriculum at the forefront of beverage education featuring a variety of formats including coffees, teas and other beverages.

Career opportunities include lodging and resort management, food and beverage management, conference and event planning management, club management and tourism development. Other opportunities include revenue management, research, development and hospitality related entrepreneurial endeavors. Students have the opportunity to gain hands on experience volunteering with student-led and other events such as: the Wine Forum of Oklahoma, the Distinguished Chef Scholarship Benefit Series, Craft Beer Forum, the IHOP Career Fair, Hospitality Legal Summit, and the Hotel Investment Conference.

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, cost controls, revenue management, and economics. Courses in service management, food and beverage production, purchasing and control, facility management and design, sales and marketing, front office management, and advanced hotel and restaurant management are also included in the specialized areas of study. The BS degree with a major in hotel and restaurant administration may be earned by completing a minimum of 120 semester hours and achieving a “C” grade in courses required in the major area and professional electives.

Successful completion of 480 hours of industry work experience and a management internship of 320 hours are required. Internship placement in hotels, restaurants, private clubs and tourism-related establishments is arranged globally in cooperation with industry executives and the OSU faculty. Study abroad programs and international internships are available.

Further information may be found at humansciences.okstate.edu/hrad.

Graduate Programs

The Master of Science Degree. Admission to the graduate program in Hospitality Administration is selective and is based on a variety of factors including undergraduate grade-point average, industry work experience, GRE/GMAT score, letters of recommendation and goals of the applicant. Prerequisite courses may be required for students with undergraduate degrees in areas other than hospitality or tourism administration. The master’s degree requires a minimum of 32 credit hours for the thesis plan or 32 credit hours for the professionally focused non-thesis plan (requires a creative component).

The Doctor of Philosophy Degree. The PhD is awarded in Human Sciences with an option in Hospitality Administration. This program focuses on research and prepares researchers, educators and practitioners to make contributions to hospitality education and the literature in the hospitality field. The doctoral program requires a minimum of 60 hours beyond the master’s degree or 63 hours if a thesis was not completed in the master’s program. The program includes a strong emphasis on research and application of statistical procedures, as well as having students gain experience in resource generation, knowledge sharing and community engagement.

A customized part-time doctoral degree program is also available for those students, especially educators, who would prefer to pursue their degree without maintaining a full-time enrollment on campus.

Competitive graduate teaching and research assistantships, graduate fellowships and tuition waivers are available to qualified applicants.

More detailed information on graduate study in the School of Hotel and Restaurant Administration can be obtained by visiting our website at humansciences.okstate.edu/hrad.
Human Development and Family Science  
Sissy Osteen, PhD—Associate Professor and Interim Head

The Department of Human Development and Family Science (HDFS) is a premier academic program dedicated to the discovery, integration, and application of knowledge to enhance the resilience of diverse individuals and relationships. The department prepares students to work with individuals, couples, and families. The department’s primary focus is on integrative approaches to developing and maintaining individual and family resilience. The distinguishing feature of HDFS is the interdisciplinary and multidisciplinary integration of instruction, research, and application between and among human development, family science, gerontology, early childhood education, and marriage and family therapy.

Committed to enhancing the quality of life for individuals and families by maximizing resilience and reducing risk, the Department of Human Development and Family Science provides a dynamic environment for lifelong learners through engagement in:

- instruction that fosters creative and critical thinking for individuals in their professional and personal lives;
- research that contributes to the discovery of knowledge and understanding of human development and family relationships; and
- application of knowledge that is responsive to and informed by constituents’ needs.

The department offers undergraduate options in early childhood education (ECE), child and family services, and family and consumer sciences education. Each of these options emphasizes integration of theory, research, policy, and practice.

Criteria for undergraduate students wishing to transfer into HDFS include a minimum required grade-point average.

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The early childhood education (ECE) teacher certification option provides professional preparation for individuals to teach PreKindergarten through third grade in Oklahoma public schools. All students completing the early childhood education option must meet Oklahoma State University and Oklahoma professional education requirements.

The child and family services (CFS) option prepares individuals for careers in providing services and leadership to children, youth, adults, and their families. The course content focuses on individual development, family dynamics, family life education, policy, management, and professional skills in the context of the community. Career opportunities are in public and private social services agencies, policy and advocacy centers, and in business and industry.

The CFS option also provides education for individuals planning to continue their education in specialized 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. Students are prepared for advanced education in such areas as family therapy, child life, educational psychology, law, and psychology. This option provides flexibility to accommodate the student’s particular area of interest or to meet prerequisites for a professional school.

The family and consumer sciences education (FACSED) option prepares individuals to provide comprehensive knowledge and skills that will help individuals, families, and communities make informed, healthy, research-based, and practical decisions to improve their well-being, society, and the economy. Two paths are available for career preparation: one for Cooperative Extension Services and one for secondary school instruction. In both, FACSED students take specialized coursework in apparel design and production, family science, hospitality management, housing and interior design, human (including child) development, nutritional sciences, parenting, resource management, textiles, and educator preparation so they are equipped to work in educational settings where they will have a significant impact on the lives of others. A semester-long internship or student teaching experience during the senior year in an outstanding program completes the undergraduate university preparation. Upon graduation, students meet the employment requirements for the Oklahoma Cooperative Extension Service. Students in the certification requirement in the Oklahoma State Department of Education, depending on which option was chosen. The job market remains strong for both careers in Oklahoma and throughout the nation.

The BS degree requires a minimum of 124 semester credit hours. Minors in child development, family science, and human sciences are also available in the department; information on requirements may be obtained from the HDFS department office or the Patricia Kain Knaub Center for Student Success.

Articulation agreements between Oklahoma State University and Tulsa Community College and between Oklahoma State University and Northern Oklahoma College provide for a transition toward a baccalaureate degree in human development and family science.

Further information may be found at humanciences.okstate.edu/hdfs.

Graduate Programs

Graduate study in the Department of Human Development and Family Science (HDFS) is designed to prepare students in the creation and application of knowledge focused on reducing risk and enhancing resilience within individuals and among families. HDFS offers graduate study leading to the Master of Science degree and Doctor of Philosophy degree. Graduate study in HDFS emphasizes the integration of high-quality research and application to address key issues in risk and resilience. The MS options include Child and Family Services, Developmental and Family Sciences, Early Childhood Education, Family and Community Services, Marriage and Family Therapy, and Gerontology. The PhD is offered through the Department of Human Development and Family Science. Students work with their advisers and advisory committees to develop flexible yet rigorous programs that meet degree requirements and professional competencies in the areas of specialization. Graduate programs in HDFS are central to departmental research. Faculty and students engage in the integration of theory and research to advance the development and application of knowledge to reduce risk and enhance resilience for individuals and families across cultures and generations.

HDFS has provided high-quality graduate education programs for decades and has graduates in leadership positions across the state and nation in all areas of specialization. The department includes four centers/institutes that enhance student experiences in graduate study: (a) the Child Development Laboratory/Rise Program, licensed by the state of Oklahoma and the National Association for the Education of Young Children in the Department of Human Development and Family Life, focusing on offering high quality marriage and family therapy to the public and a training environment for master’s degree students who choose the Marriage and Family Therapy option; (c) the Gerontology Institute, focused on advancing the quality of life for older populations through interdisciplinary programs of instruction, research, and public service; and (d) the Center for Family Resilience focused on the promotion of resilience and reduction of risk among individuals, couples, and families across the lifespan in rural and urban areas of Oklahoma through multidisciplinary research, education, and outreach.

The Master of Science Degree

The MS degree in Human Development and Family Science is awarded in six options. Applicants specify the option in which they are seeking the MS degree as part of the application process: Child and Family Services (available on both the Stillwater and Tulsa campuses), Developmental and Family Sciences (available on both Stillwater and Tulsa campuses), Early Childhood Education (available on the Stillwater campus), Marriage and Family Therapy (COAMFTE Accredited; available on the Stillwater campus), Gerontology (offered on the Stillwater campus and online through the Great Plains Interactive Distance Education Alliance), or Family and Community Services (offered online through the Great Plains Interactive Distance Education Alliance).

Admission to the MS program is selective and requires the completion of a bachelor’s degree in Human Development, Family Science, Child and Family Science, Early Childhood Education, or a related area. Admission decisions are based on a variety of criteria, including grade-point average (3.0 minimum grade-point average in undergraduate work), GRE scores (scores of 450 or higher in each of the Verbal and Quantitative sections and 3.5 or higher on Analytical Writing or the equivalent on the August 2011 revision of the GRE are preferred for admission), TOEFL scores (required for students for whom English is a second language, 575 minimum), three letters of recommendation, statement of student goals, and a résumé or vita. Students need to complete both the OSU Graduate College Application and an HDFS Department Application. Admission is available only for the fall semester in the Marriage and Family Therapy option. Applications are reviewed for the fall and spring (on a space available basis) in the other four options.

Students in each option take a minimum of 18 credit hours of department core courses designed to prepare them to integrate theory, research, and application focused on reducing risk and enhancing resilience within individuals and among families across cultures and generations. Additional course work (ranging from a minimum of 12 semester hours to a maximum of 44) in each option, approved by the adviser and student’s advisory committee, is focused on integrating theory, research and application within the option. Four options (Child and Family Services, Early Childhood Education, Marriage and Family Therapy, and Gerontology) offer both a thesis and non-thesis option (requiring a comprehensive examination). The Developmental and Family Sciences option requires a thesis. A minimum number of semester hours required for each option is:

- Child and Family Services (36 semester hours for thesis or non-thesis plan), Early Childhood Education (30 semester hours for thesis plan or 32 for non-thesis plan), Developmental and Family Sciences (36 semester hours for thesis plan), Marriage and Family Therapy (63 semester hours), and Gerontology (39 semester hours for thesis plan; 36 semester hours for the non-thesis plan; and 36 semester hours for the online program through the Great Plains Interactive Distance Education Alliance). The Family and Community Services option offered online through the Great Plains Interactive Distance Education Alliance requires 36 hours in a non-thesis format requiring a creative component.

The Child and Family Services option is designed to develop leadership in Child and Family Services programs. Graduates: (a) demonstrate an ability to...
The PhD option in HDFS provides students with the opportunity to concentrate basic and applied research, to provide relevant instruction, develop effective empirical knowledge base in HDFS and investigate key processes associated through research collaborations. Doctoral students collaborate with faculty and are designed to promote breadth, depth and integration of knowledge in HDFS.

The Family and Community Services option focuses on the development and practice of programs and policies designed to improve the well-being and functioning of individuals, families, and communities. This program prepares individuals to function in human services, public policy, administration, and teaching roles. Course work includes courses in systems theory, marriage and family therapy, human development and family science methods classes and research practica.

The Gerontology option engages students in an in-depth study of adulthood, the aging process, healthy aging, and the role of aging in our society. This program prepares students for careers in gerontology, such as social worker, case manager,geriatric nurse, and gerontologist. Students develop skills in research, assessment, and the application of research to practice. Course work includes courses in systems theory, marriage and family therapy, human development and family science methods classes and research practica.

The Marriage and Family Therapy option is accredited by the Commission on Accreditation for Marriage and Family Therapy Education (COAMFTE) of the American Association for Marriage and Family Therapy. This program prepares students for careers in marriage and family therapy, such as marriage and family therapist, marriage and family counselor, and family mediator. Course work includes courses in systems theory, marriage and family therapy, human development and family science methods classes and research practica.

The PhD program in HDFS is a research doctoral program designed to promote breadth, depth and integration of knowledge through research collaborations. Doctoral students collaborate with faculty and other graduate students on research projects which integrate the theoretical and empirical knowledge base in HDFS and investigate key processes associated with risk and resilience. Upon graduation, doctoral students have the knowledge and experience to develop into leading scholars able to conduct high quality basic and applied research, to provide relevant instruction, develop effective interventions, and contribute to the development of informed public policy that reduces risk and enhances resilience within individuals and among families across cultures and generations.

The PhD option in HDFS provides students with the opportunity to concentrate on one of the following disciplines: Human Development or Family Science. Students are admitted to the program to focus in a primary discipline in the department (human development or family science) and to take additional course work in a secondary discipline (human development is the secondary discipline for family science students and family science is the secondary discipline for students in human development).

PhD graduates are prepared to apply knowledge in human development and family science in a collaborative manner in diverse settings. To accomplish this goal, the program is designed around four primary themes: breadth (knowledge of substantive content across the two disciplines of human development and family science), depth (knowledge of substantive content within one discipline, either human development or family science), integration (knowledge synthesized to capitalize on the strengths of the disciplines of human development and family science), and experience (knowledge gained through involvement in research, instruction, and a variety of applications associated with reducing risk and enhancing resilience of individuals and families).

To achieve breadth, depth, and experience in the primary emphasis area and in the integration between human development and family science, students take courses and participate in individualized experiences, approved by their major advisor and doctoral advisory committee, that guide the student in mastering the forms of knowledge and skills (teaching, research, and service) and functions (discovery of knowledge, integration of knowledge, application of knowledge, and transmission of knowledge) of scholarship expected of doctoral graduates in HDFS.

Two options are available: 90-hour program for BS graduates and 60-hour program for MS graduates (with additional coursework possible for students with BS and MS degrees in other fields). Doctoral training includes participation in research throughout the doctoral program, a qualifying examination in statistics, and completion of required course work and experiences. The coursework includes courses in systems theory, marriage and family therapy, human development and family science methods classes and research practica.

More information on the PhD program in HDFS can be obtained from the HDFS department at humansciences.okstate.edu/hdfs or by e-mail humansciences.hdfs@okstate.edu.
option is the only option that includes the Didactic Program in Dietetics (DPD) coursework required to apply for competitive dietetics internships (DI). When students successfully complete the academic requirements (DPD) and supervised practice component (DI), they are eligible for the national Registration Examination for Dietitians administered by the Commission on Dietetic Registration (CDR) of the Academy of Nutrition and Dietetics (the Academy). Individuals who successfully complete the examination become Registered Dietitians/Nutritionists and are entitled to use the initials "RD" or "RDN" to signify professional competence. Many states, including Oklahoma, also require a license to practice dietetics in the state. Each state law varies in its scope. Didactic Program in Dietetics information and the DPD Student Handbook are found at humansciences.okstate.edu/dpd.

The Didactic Program in Dietetics is currently granted continuing accreditation by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics, 120 South Riverside Plaza, Suite 2000, Chicago, Illinois 60606-6995, 312.899.0040 ext. 5400. Nutrition professionals work in a wide range of settings, in both the public and private sectors and assume an array of challenging responsibilities. Career opportunities for a registered dietitian dietetic technician include: health care settings and administrator, nutrition researcher, fitness/wellness consultant, public health nutritionist, school nutrition director, Cooperative Extension educator, entrepreneur in dietetic programs and services, and corporate dietitian/nutritionist. DPD Graduates who do not enter dietetic internships may work in related fields which do not require the RD credential such as school food service, Cooperative Extension, pharmaceutical or food sales, food service management and government programs; take the certified dietary manager (CDM) exam; or enter related graduate programs such as Master of Science in Nutrition from Oklahoma State University.

Admission Requirements. Transfer students must have earned a 2.5 retention GPA in order to be admitted to the NSCI undergraduate program. Further information may be found at humansciences.okstate.edu/nscl.

Dietetic Internship. The dietetic internship (DI) at Oklahoma State University requires a bachelor’s degree and prior completion of the DPD requirements for admission and meets the Academy’s 1200 hour supervised practice requirement for registration eligibility. Its mission is to advance health and quality of life through professional expertise by preparing dietetic professionals for competent practice through education, discovery and application of scientific knowledge. The internship provides experience in clinical, management, and community practice settings where interns develop entry-level practice competence. Entry into the dietetic internship program requires completion of the following: the online DPD verification statement, verification of prerequisite courses, and the CDR dietitian registration examination.

Graduate Programs.

The Department of Nutritional Sciences offers graduate study leading to a Master of Science degree in nutritional sciences and a Doctor of Philosophy degree in nutritional sciences. Graduate study in NSCI emphasizes the conduct of research and application of research to the field of human nutrition. Graduate students work with an adviser and advisory committee to develop flexible, yet rigorous programs of study and research that meet the degree requirements and each student’s professional goals within an area of specialization in the field.

The Master of Science Degree. The MS degree program is designed to develop research skills, stimulate independent thought and critical thinking, and provide up-to-date knowledge in a variety of areas of human nutrition. Admission to the MS graduate program is selective and based on a variety of factors including the student’s grade-point average (overall and science GPA), Graduate Record Examination (GRE) scores, letters of recommendation and goal statement. The prerequisite for the MS program is a BS in nutritional sciences. Students with a BS degree in a subject area other than nutrition are required to have a minimum of 30 credit hours of undergraduate/graduate coursework that is related to nutritional sciences. This coursework must include at least one course in biochemistry, one course in physiology and one upper-level nutrition course prior to full admission. Applicants who do not meet this requirement may be considered for conditional acceptance and required to take prerequisite courses and/or demonstrate academic ability.

Students in the MS program-nutrition option can choose one of two tracks: thesis or non-thesis. The MS degree with thesis requires a minimum of 30 credit hours, including six credit hours for thesis research (NSCI 5900). Thesis research is conducted within the adviser’s area of interest and is approved by an advisory committee. The non-thesis MS degree requires a minimum of 34 credit hours with three credit hours of NSCI 5843, including a comprehensive examination, a written research paper, and an oral presentation. The student's plan of study and research is determined in consultation with his/her adviser and advisory committee.

An online Master of Science degree in nutritional sciences with an option in dietetics is also offered to Registered Dietitians (RD) or individuals who are RD eligible. OSU offers this degree program as a member of the Great Plains Interactive Distance Education Alliance (Great Plains IDEA) which provides the opportunity for Registered Dietitians to study with faculty from eight universities in the Alliance via Internet-based courses. The MS in Dietetics requires completion of 36 credit hours, including nine core credits, six OSU Nutritional Sciences Core credits, 18 elective credits and NSCI 5843. A faculty adviser and the graduate committee from the Nutritional Sciences department must approve a student’s program of study. More detailed information can be found at: gpipea.okstate.edu.

The Doctor of Philosophy Degree. The PhD degree is awarded in nutritional sciences. Two programs are available: a 60 hour program for MS graduates and a 90 hour program for BS graduates. The focus of the program is to prepare individuals for careers in a variety of areas including higher education, industry, healthcare and government programs. Admission to the program is competitive, and applicants are expected to provide evidence of exceptional academic ability and preparation, a statement of goals and letters of recommendation. Grade-point average in previous undergraduate, professional school and graduate course work and Graduate Record Examination (GRE) scores are considered in the evaluation of the applicant. If a thesis was not required as a component of the applicant’s MS program, a thesis or equivalent must be completed in addition to the requirements for the doctoral degree. Prerequisite course work for full admittance to the PhD program includes at least one graduate or undergraduate course in biochemistry and physiology, six credit hours at the graduate level in nutrition and three credit hours of statistics. Students also gain experience in resource generation, knowledge sharing and community engagement. Each program of study is designed by the student under direction of his/her faculty adviser and advisory committee to develop the student’s competence in an area of specialization and research methodologies. Students also gain experience in resource generation, knowledge sharing and community engagement. Each program of study is designed by the student under direction of his/her faculty adviser and advisory committee to develop the student’s competence in an area of specialization and research methodologies. Students also gain experience in resource generation, knowledge sharing and community engagement. Each program of study is designed by the student under direction of his/her faculty adviser and advisory committee to develop the student’s competence in an area of specialization and research methodologies.
Spears School of Business

College Administration
Ken Eastman, PhD—Dean
Karen Flaherty, PhD—Associate Dean
Carol Johnson, PhD—Associate Dean
Ramesh Sharda, PhD—Vice Dean

Campus Address and Phone:
201 Business Building, Stillwater, OK 74078
405.744.5064
Website: spears.okstate.edu

The Spears School of Business focuses on preparing students to make a difference in the world by teaching essential interpersonal skills alongside a high-quality business education backed by impactful research and outreach. We live in a deeply interconnected world where business is personal while simultaneously more distant. In this world, companies rise and fall based on the strength and success of the relationships they forge.

Spears Business prepares our students for this world by having them live and learn in an environment where personal connections are paramount and academic excellence is strengthened by interpersonal prowess. We take soft skills seriously. We study business collaboratively. We use technology to include and never to exclude. Community isn’t just a byproduct of what we do. At Spears, we empower students to follow their own dreams, not the dream we have for them—because the purpose of business isn’t just individual gain, but a gain for every individual.

With an emphasis on people and community, we ensure our students are just as real as they are ready. In a rapidly changing world, the only constant is people. This is why students choose Spears, why employers choose our graduates, and why we make business personal.

Accreditation
The Spears School of Business (spears.okstate.edu) at Oklahoma State University is accredited by The Association to Advance Collegiate Schools of Business (AACSB International). All Spears programs are AACSB accredited with the exception of the M.S. in Economics and the PhD in Economics which do not come under the AACSB’s scope of review.

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 which includes entering freshmen. For full consideration as a prospective student, applications should be sent to the OSU Office of Scholarships and Financial Aid by February 1 during one's senior year in high school. Spears School of Business scholarships are primarily designated for sophomores, juniors and seniors. Scholarship awards are based on academic performance, participation, leadership and need, and applications must be received by the end of January.

Academic Advisement and Enrollment Procedure
The Business Student Success Center believes in a holistic approach to advising, beginning with prospective students that are interested in programs through the Spears School. After admission to OSU, each undergraduate student is assigned an academic counselor who is eager to help students create an academic plan of action, guide them toward university resources, and serve as a mentor. The professional academic counselors are invested in each student’s collegiate life, as well as their success at OSU and beyond. The Business Student Success Center provides a link between the Spears School and other university resources that are available to facilitate student success.

Academic Programs
Undergraduate Programs. The Bachelor of Science in Business Administration degree is offered by five departments and two schools. Departmental majors are listed below.

Accounting, with a major in accounting.
Economics and Legal Studies in Business, with majors in economics (with options in business economics and quantitative studies and pre-law) and general business (with an option in pre-law).

Entrepreneurship, with a major and minor in entrepreneurship.
Finance, with a major in finance and an option in commercial bank management.
Management, with a major in management and options in business sustainability, human resource management, non-profit management and sports management.
Management Science and Information Systems, with a major in management information systems and options in management science and computer systems and information assurance.
Marketing, with majors in marketing and international business.

Additional information about the undergraduate programs in the Spears School of Business can be found on the Internet at spears.okstate.edu/future/undergraduate.

Outstanding students in the Spears School of Business who meet the requirements of the Honors College may earn various honors designations while completing their undergraduate degree in this School. For more information, please refer to the Honors College information in the Catalog.

Master's Degree Programs. Two types of master's degrees are available to students desiring to undertake advanced work in the business area, specialized master's of science degrees and the interdisciplinary Master of Business Administration degree. Students enrolled in the programs will be charged a $250 fee to support Career Services and Professional Development activities.

The Master of Business Administration degree allows concentrations in management, management information systems, marketing, entrepreneurship, or finance. The following identifies where additional information about these degrees can be found in the Catalog:

The Master of Business Administration degree (see “Business Administration”)
The Master of Science degree requires completion of a graduate major in accounting, economics, entrepreneurship, management information systems, quantitative financial economics or telecommunications management. The MBA also allows more in-depth study in the areas of accounting, marketing analytics, risk management, information assurance and network security, information systems, telecommunications management, entrepreneurship and economics. The following identifies where additional information about these degrees can be found in the Catalog:

Master of Science in Accounting degree. (See “School of Accounting”)
Master of Science in Business Analytics degree. (See “School of Marketing and International Business.”)
Master of Science in Economics degree.* (See “Department of Economics and Legal Studies in Business.”)
Master of Science in Entrepreneurship degree. (See “School of Entrepreneurship.”)
Master of Science in Quantitative Financial Economics degree. (See “Department of Finance.”)
Master of Science in Telecommunications Management degree. (See “Department of Management Science and Information Systems.”)

*The Master of Science in Economics is not subject to AACSB accreditation

Doctor of Philosophy Degree Programs. Graduate work toward the Doctor of Philosophy degree with a major in economics is offered in the Department of Economics and Legal Studies in Business*. Graduate work toward the Doctor of Philosophy degree with a major in business administration is offered in the departments of Finance, Management, Management Science and Information Systems, the School of Accounting, the School of Entrepreneurship, and the School of Marketing and International Business. The Spears School also offers a PhD in Business Administration that is tailored for executives.

Additional information about PhD programs can be found in the “Business Administration” section as well as in the various departmental sections.

*The PhD in Economics is not subject to AACSB accreditation.

Career Services
The Eastin Center for Talent Development unites career readiness, career services and corporate engagement in the Spears School. Starting with integrating career development projects into the first year experience, services are designed specifically for Spears School students. The career consultants
within the Spears School are certified Global Career Development Facilitator’s (GCDF’s). The Eastin Center for Talent Development offers opportunities for students to explore careers, assess career interests, build resumes, prepare for interviews, identify internship opportunities and ultimately find the right job. The center also provides students a direct link to OSU career services and showcases the numerous resources available across campus.

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 31 hours in the breadth areas. These include: six hours in American history and government, three hours in social and behavioral sciences, six hours in humanities, three hours in analytical and quantitative thought and seven hours in the area of natural sciences, with one of the hours in scientific investigation.

Students are also required to take a “diversity” (D) designated course. This may be met in any part of the student’s program, and thus does not necessarily add to the number of hours required. Diversity courses provide an understanding of the cultural context of relationships, issues and trends in a multicultural and diverse society related to such factors as culture, ethnicity, nationality, age, gender, sexual orientation, mental and physical characteristics, education, family values, religious and spiritual values, socioeconomic status and unique characteristics of individuals, couples, families, ethnic groups, and communities.

An additional requirement is an "international dimension" (I). This also may be met in any part of the student's program, and thus does not necessarily add to the number of hours required. The international dimension simply requires each student to learn about cultures and societies outside the United States. The scientific investigation requirement involves some kind of laboratory experience with student involvement. More details concerning these and other requirements can be 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. 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 (I) requirement and one must be selected to satisfy the diversity (D) 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 three hours elected from courses identified by the University as satisfying social science (S) credit.
- Humanities and fine arts: Six semester credit hours elected from courses identified by the University as satisfying humanities (H) credit.
- Natural science and mathematics: A minimum of 10-13 semester credit hours; six 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 speech communication, three hours.
- Business courses: Undergraduate business majors must complete the following business core course requirements: ACCT 2103, ACCT 2203, MGMT 4513, ECON 2103, 2203, EEE 2023, FIN 3113, LBS 3213, MGMT 3013, MKTG 3213, MIS 2103, 3223, and STAT 2023. 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 LEIS and HHP activity courses to complete degree requirements.

Credits earned during the freshman and sophomore years at a two-year college may not be substituted for junior and senior course requirements in majors in the Spears School of Business.

Departmental Clubs and Honor Societies

- African American Business Students Association
- Alpha Kappa Psi
- Association for Information Systems
- Association of Information Technology Professionals
- Beta Alpha Psi (accounting honor society)
- Beta Gamma Sigma (business administration honor society)
- Business Honors Organization
- Business News Club
- Business Student Council
- Delta Sigma Pi (professional business organization)
- Economics Society
- Entrepreneurship Club
- Financial Management Association
- Freshman Business Student Leaders
- GARP Student Chapter: Organization for MSQFE Students
- Human Resource Management Association
- Information Security and Assurance Club
- American Marketing Association
- MBA Student Association
- Net Impact
- OSU-Tulsa Business Association
- Phi Beta Lambda (business leadership)
- Sports Management Club
- Students in Free Enterprise

School of Accounting

Robert Cornell, PhD—Associate Professor and Head

The School of Accounting offers three degree programs in accounting: (1) BS in Business Administration with a major in accounting, (2) MS in accounting and (3) PhD in business administration with emphasis in accounting.

The common objective of the BS and MS in 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 BS in accounting program is to provide basic conceptual and business knowledge as a foundation for accounting career development; the objective of the MS in accounting is to provide candidates with a greater breadth and depth in accounting than is possible in the BS program, in order to prepare graduates for careers as professional accountants in financial institutions, industry, non-business organizations and public practice.

Students who are considering a professional accounting career should have above-average aptitudes in mathematics and English, disciplined work habits, an interest in working with people and an attitude of service.

Students who have the objective of sitting for the CPA exam in Oklahoma must have a BS degree and are required to complete 150 semester hours consisting of 76 upper-division hours, 30 hours of accounting above introductory accounting (including 3 hours of external auditing), and nine upper-division hours from other business related areas. The Professional Program in Accounting (PPA) is especially designed to enable students to become CPA eligible. The PPA allows students to complete the requirement of 150 hours of education and receive a BS and MS in accounting. The MS in accounting earned at Oklahoma State University satisfies educational requirements for CPA candidates in all jurisdictions of the United States.

Accreditation. The School of Accounting is separately and fully accredited by the Association to Advance Collegiate Schools of Business (AACSB International).

Graduate Programs

The Master of Science in Accounting Degree. The specific objective of the MS in accounting is to provide candidates with a greater breadth and depth than is possible in the BS program, in order to prepare graduates for careers as professional accountants in financial institutions, industry, non-business organizations and public practice and to develop judgmental ability in accounting and related areas. Advanced courses provide a theoretical base for insight into significant problems confronting the accounting profession. In addition, a specialty in financial reporting, taxation, management information systems, finance or entrepreneurship 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. Minimum admission standards are a GMAT score of 550, an undergraduate grade-point average of 3.25, and an overall grade-point average of 3.0.

The Doctor of Philosophy Degree. The PhD in the Spears School of Business 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 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 GRE. Admission is very competitive.

The PhD 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 systems or taxation. All candidates are required...
The Master of Business Administration Degree. The Master of Business Administration program provides graduate professional education for individuals preparing for administrative careers in either private or public sectors. It is a comprehensive yet flexible program providing the knowledge and analytical tools to cope with the complexities of management within diverse environments. There are a number of delivery options for the MBA: full-time, part-time, and distance.

Full-Time MBA. The full-time MBA is a 45-credit-hour semi-semester step program designed for individuals who want a cohort-based experience. Applicants must have earned a four-year undergraduate degree or equivalent from an accredited university and have competitive GPA and GMAT scores. Full-time students may choose between a general MBA and an in-depth specialization. Students choosing a general MBA are free to select 12 hours of electives in functional areas of business such as marketing, finance, and management. Students seeking a more in-depth area of study may select from the following seven options: accounting, marketing analytics, entrepreneurship, risk management, information assurance and network security, information systems, telecommunications management and economics.

Part-time MBA. The part-time MBA is a 42-credit-hour program designed for individuals who wish to enroll on a part-time basis. The self-paced program allows students to take classes as their schedules permit. Applicants must have earned a four-year undergraduate degree or equivalent from an accredited university and have competitive GPA and GMAT scores.

Distance Learning. The MBA part-time program can be completed through a distance learning format. Distance learning is an ideal educational format for individuals seeking an alternative to the traditional on-campus classroom experience. Classes are delivered via video streaming on the Internet. Interaction with faculty and other students occurs through a web-based environment.

Regardless of the delivery option, 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 PhD in business administration is an interdepartmental program in the Spears School of Business, including accounting, entrepreneurship, finance, management, management science and information systems, telecommunications management and economics. 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 business or governmental positions.

Requirements. Students select one major area of study from either accounting, entrepreneurship, finance, management, management information systems, management science 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 Spears School of Business. The second minor may be taken from another department within the Spears School of Business or from a department outside the Spears School. All candidates for the PhD degree in business administration are expected to have a basic competence in all the major functional areas of business administration—accounting, economics, finance, management, management information systems/management science 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 Association to Advance Collegiate Schools of Business (AACSB International) 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.

Economics and Legal Studies in Business
Lee Adkins, PhD—Professor and Head
Economics is a social science concerned with behavior of individuals, governments, firms, and nations when confronted with scarcity imposed on mankind by the physical world. The discipline is based on a simple set of principles that are used to model decision-making in a wide variety of other fields of study. Economic principles are applicable to analyze and predict the both intended and unintended consequences of human action. Economics 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 processes 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 economic developments 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, non-profit private organizations and national or international government agencies. A degree option in business economics and quantitative studies is offered to provide additional training in analytical methods and communication skills for both public- and private-sector occupations. The undergraduate degree in economics also provides an excellent background for studying law or international relations and, to this end, there is a pre-law option and an international economic relations option. A student interested in pursuing graduate studies in economics should include a wide range of math courses in their undergraduate curriculum.

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 a required upper-division program that does not specialize in the student’s major area. The master’s degree in economics also provides an excellent background for studying law or international relations and, to this end, there is a pre-law option and an international economic relations option. A student interested in pursuing graduate studies in economics should include a wide range of math courses in their undergraduate curriculum.

The Master of Science degree. Admission to the master’s program in economics is granted to college graduates with superior academic records. Students must have an undergraduate economics degree, be well grounded in economic theory, and have an excellent mathematical background. A total of 30-33 graduate credit hours are required to earn an MS in economics.

Each graduate student is guided in the preparation of a plan of study by the graduate adviser. At the master’s level, there are two options. One provides the student with a well-rounded program that does not specialize in any particular area of economics. The second option is applied economics, which stresses communication skills, quantitative analysis and course work from other disciplines related to a career objective. The candidate for the master’s degree is required to have competence in basic economic theory and statistical methods, together with an understanding of the fundamental institutional operations of the United States economy.

A research report or thesis is required of all students who take only the MS degree. 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 superior academic records. A total of 80 graduate credit hours are required to earn a PhD with a previously earned MS degree. A total of 90 graduate credit hours is required to earn a PhD without a previously earned MS.

The PhD program stresses balanced preparation in economic theory, 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 one field of specialization. (The theory core is not considered a field of specialization.) Competence must be demonstrated in a second field of specialization through course work. The graduate adviser helps the student develop a plan 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 PhD degree in economics. The final oral examination is the dissertation defense.

*Our MS in Economics is not subject to AACSB accreditation because Economics programs reside and are administered in colleges of arts and sciences.

School of Entrepreneurship

Bruce Barringer, PhD—Professor and Head

The 21st century is the age of entrepreneurship. It is a time of dynamic change where entrepreneurs must be fast, nimble and able to change direction quickly, more aggressive, and more innovative in order to survive. The program in entrepreneurship helps prepare students for the entrepreneurial age. Students are encouraged to recognize and develop their innate entrepreneurial potential, and to apply an entrepreneurial mindset to both their professional and personal lives. The program emphasizes the role of entrepreneurial attitudes and behaviors in a wide variety of contexts, including new start-up ventures, growth-oriented small firms, family firms, non-profit entities, and public sector organizations.

Students are further encouraged to apply entrepreneurial thinking and acting within other disciplines, from architecture and engineering to social work and theatre.

Entrepreneurship is approached as opportunity-driven behavior. It is a process where individuals put resources together in new and novel ways to create value. The value created can be for customers in conventional markets, or can be a social value for the community. To foster entrepreneurship, the program places a high value on helping students develop competencies that will enable them to be more entrepreneurial in a wide variety of contexts. Eleven core competencies are emphasized, including recognizing opportunity, assessing opportunity, mastering your creativity, leveraging resources, guerrilla skills, mitigating and managing risk, planning when nothing exists, innovation—developing ideas that work, building and managing social networks, the ability to maintain focus yet adapt, and implementation of something novel or new. A leading-edge entrepreneurship curriculum is built around these competencies.

As a field of study, entrepreneurship helps students see themselves as agents of change, and better equips them to implement creative solutions to emerging opportunities in literally any organizational context. To foster these abilities, the program places a considerable emphasis on experiential learning. Carefully selected experiential opportunities are built into each of the entrepreneurship courses at the undergraduate and master’s levels. In addition, the School manages an incubator, where students can start ventures, a campus-wide business Pitch & Poster Competition, and other student engagement initiatives.

In addition to graduate offerings, the program offers an undergraduate major and minor in entrepreneurship as well as a cross-campus program involving the integration of entrepreneurship into other disciplines (e.g., engineering, art, psychology). More information about entrepreneurship at OSU can be found at entrepreneurship.okstate.edu.

Graduate Programs

The School of Entrepreneurship offers work leading to the Master of Science in Entrepreneurship degree, including both a residency and online program. In addition, concentration in Entrepreneurship is offered as part of the Master of Business Administration. A PhD in business administration with concentration in entrepreneurship is available to prepare students for careers in academia.

The Master of Business Administration (MBA) Degree with Entrepreneurship Concentration. (See "Business Administration"

Master’s in Entrepreneurship. The Master’s in Entrepreneurship (MSE) provides a rigorous immersion into the nature of entrepreneurship and the entrepreneurial process. Core content is coupled with a strong commitment to experiential learning. Students are provided the opportunity to start a venture while in the program. The program is a component of the university-wide entrepreneurship emphasis at Oklahoma State University. It is targeted to students with a passion for entrepreneurship in for-profit, non-profit, and public sector contexts.

The master’s program consists of 33 credit hours of coursework and can be completed in one calendar year. The application for admission to the program requires (1) Bachelor’s degree, (2) Proposal for a venture, (3) GMAT, (4) Entrepreneurial and other work experience (recommended but not required), (5) three letters of recommendation. Based on this review, a personal interview is arranged with selected candidates, and then a final acceptance decision is made. Applicants are responsible for ensuring all relevant materials are submitted to the School prior to deadlines. An online version of the program is also available.

The Doctor of Philosophy Degree. The PhD in business administration with concentration in entrepreneurship is primarily focused on producing scholars who will be thought leaders in the discipline of entrepreneurship. The program prepares students primarily for careers in academia. Coordinated by the School of Entrepreneurship, students are given an intense exposure to theory and research methods.

The doctoral program involves sixty credit hours beyond the master’s degree, of which approximately forty-two hours are course work, depending upon the student’s background, the remaining hours are associated with dissertation work. It is a four-year program, with two years devoted to course work, followed by comprehensive exams and a dissertation proposal, and then the writing and defending of the dissertation. Students complete fifteen hours of core doctoral seminars in entrepreneurship and management, twelve hours of statistics and research methods courses, nine hours of doctoral or equivalent hours in a minor field, and six hours of approved doctoral-level or equivalent electives. Students typically minor in such fields as psychology, sociology, anthropology, public policy, or finance.

Doctoral students are expected to publish while in the program, and also to teach entrepreneurship courses. Faculty mentors work closely with students on research projects while they are in the program, initially involving the student in ongoing research projects, and ultimately working on projects initiated by the student. Students are expected to develop and refine their research interests over the first two years of the doctoral program, culminating in the identification of a dissertation topic. The School of Entrepreneurship, with a world-class cadre of entrepreneurship researchers, is well-positioned to support a wide range of topical areas that fit the student’s interests.

Outstanding individuals with master’s degrees in any field of study may apply. The application for admission to the program is evaluated based on (1) undergraduate and graduate grade point averages, (2) the student’s score on the Graduate Management Admission Test (GMAT), (3) a two- to three-page statement describing career goals, academic interests and research questions that intrigue the applicant, (4) three letters of recommendation, and (5) evidence of research potential. Based on this review, a personal interview is arranged with selected candidates, and then a final acceptance decision is made. Applicants are responsible for ensuring all relevant materials are submitted to the School prior to deadlines.

Finance

John A. Polonchek, PhD—Professor and Head

Financial executives are of central importance to the overall planning, control and success of an organization. There are financial implications in virtually all organizational decisions, whether the organization is a business firm, a non-profit organization or a government agency. With each new project or finance the importance of finance for all organizations has grown. Every decision maker must have sufficient knowledge of finance to determine the financial implications of their decisions.

Finance has evolved from a descriptive discipline in the early 1900s to the analytical discipline we find today. Finance theoreticians use fundamental economic theory to develop valuation models and the tools of financial analysis and risk management that are used by finance practitioners to make financial decisions. Finance consists of three interrelated core areas: financial markets and institutions, investments and portfolio theory, and managerial (business) finance. Subsets of these core areas include personal finance, real estate finance, international finance, the management of financial institutions, insurance, entrepreneurial finance, and derivative securities and risk management.

The primary objective of the undergraduate finance curriculum is to produce graduates who have a broad understanding of the financial aspects of their decisions and actions and who are capable of utilizing the fundamental tools of financial analysis. Toward these ends, the development of elementary mathematical and statistical skills and the study of economics, accounting and business administration are needed to accomplish the objective. The major in finance prepares students for positions that require special understanding of financial analysis, financial management and financial systems in a wide variety of organizations.

A career in financial management can begin in one of several positions that may lead to a major executive position, including chief executive officer. Initial positions in the managerial finance area include capital budgeting analyst, cash manager, credit analyst, financial analyst (who works closely with accountants), financial manager. Alternatively, finance majors may choose to enter the financial services industries. Finance majors could enter the workforce in the banking industry as a loan officer, or as a member of the trust department; in the securities industry as a securities analyst, as an investment banker, as a stockbroker or account executive, or as a financial planner; and in the insurance industry as an agent or underwriter.

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Graduate Programs
Concentrations in finance are offered through the Master of Business Administration, Master of Science in Quantitative Financial Economics and Doctor of Philosophy degrees.

The Master of Business Administration (MBA) Degree. (See "Business Administration.")

The Master of Science in Quantitative Financial Economics Degree. The discipline of quantitative finance has evolved tremendously in recent years, spurred by business and financial institution demand for quantitative skills. Oklahoma State University offers a Master of Science Degree in Quantitative Financial Economics (MSQFE) to meet this demand. The objective of the MSQFE is to produce graduates with mathematical, statistical and financial modeling skills necessary to support advanced financial and economic decision making.

The MSQFE is a Spears School of Business degree program that draws on the combined expertise of five OSU departments—Finance, Economics, Mathematics, Statistics and Agricultural Economics. The program is designed to produce graduates with the skills necessary to participate in critical decision making processes at all levels of the organization. The program focuses on the analytical methods necessary for effective participation in the fields of investment management, risk management, and financial engineering. Significant coursework is devoted to the development of mathematical and statistical skills. These skills are necessary to evaluate the uncertain outcomes found in financial decision making. The program provides students with the opportunity to apply their knowledge and skills to projects that utilize quantitative financial tools and techniques. The MSQFE program seeks to develop student competencies in risk evaluation methods, empirical estimation techniques, valuation theory techniques, mathematical solution methods, capital budgeting, demand analysis and risk management.

The MSQFE is a 33 credit hour program. The core 24 hours consists of classes required of all students in the program. Students may elect to complete a master's thesis. This option would reduce the number of elective hours from nine to three.

The admission requirements include an earned undergraduate degree from a college or university of recognized standards. In addition to the Oklahoma State University Graduate College's standard requirements, the program's Curriculum Committee will consider the applicant's letters of recommendation, GMAT or GRE score, previous academic performance and financial/statistical modeling experience. The background necessary to complete the program with only 33 hours of course work includes ten hours of calculus, differential equations, statistical methods, intermediate microeconomics and principles of finance.

Additional information about the program is available on the Internet at http://watson.okstate.edu/msqfe/.

The Doctor of Philosophy Degree. A PhD in business administration with concentration in finance prepares the student for careers in academia, 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 competency and teaching skills. The program provides a supportive environment conducive to the exchange of ideas and the development of new insights by both faculty and students.

Students will select finance as their major area of study. Two areas of concentration are also to be selected. As support for the major 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 accounting, calculus, statistics, and econometrics. 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, (GMAT), (3) a two- or three-page statement describing goals and academic interests, (4) at least three letters of recommendation, (5) evidence of research potential and (6) a personal interview when feasible. It is the applicant's responsibility to see that all materials related to these criteria are received by the Department of Finance.

Additional information about the program is available on the internet at Watson.okstate.edu/financephd/.

Management
James M. Pappas, PhD—Associate Professor and Head

The purpose of organizations is to channel the efforts of individuals to accomplish goals working together in a meaningful way to realize success in business or in solving pressing social problems requiring skilled managers.

The field of management is concerned with applying social, psychological and economic theories of human behavior to the real-world problems of designing organizations leading and motivating employees, planning effective courses of action and efficiently allocating resources. Since the field of management deals with real-world problems, students should have an interest in acquiring a deep understanding of human behavior and applying this knowledge in a variety of different contexts to create value for themselves and others.

The Department of Management offers an undergraduate major in management with options in human resource management (HRM), sports management and business sustainability. The department also offers graduate studies leading to an MBA degree or a PhD degree. The disciplines spanned by these degrees offer dynamic, exciting career possibilities to students at all levels.

Management. Undergraduate students should look forward to both intellectual growth and the development of management skills that are in high demand in today's competitive business world.

The Management major, as well as the three optional specializations, are concerned with the analytical process and the application of decision tools and relevant theory to creative problem solving. While the topics vary from one option to another, the common thread running through the Management major is the rational process of managing organizations, solving problems and accomplishing goals.

The major in management offers dynamic, exciting possibilities for study and employment by preparing students for leadership positions in all types of organizations. Some examples of topics include leadership, strategic management, planning courses of action, organizational behavior, resource allocation and administration. Students with degrees in management are employed by organizations of all types and sizes as managers or staff specialists. The major has flexibility so that the student may choose coursework from any of the other business disciplines. The management major is a good choice for those interested in for profit leadership roles in business, non-profit and public sector organizations.

Option in Human Resource Management. Students in the human resource management option study topics pertaining to the management and well-being of an organization's workforce, including compensation administration, labor relations, recruitment and selection, and training and development. This option is designed to prepare students for careers in human resource management or for careers that facilitate the attainment of a competitive advantage through human capital. A career as an HRM professional offers many opportunities, such as developing and implementing innovative HR policies and assisting employees with career challenges and opportunities.

Option in Sports Management. Sports enterprises are becoming increasingly concerned with their "bottom line," and they need employees who have business skills as well as expertise in the sports industry. The sports industry includes an amateur, college, minor league and professional level sports organizations and is an industry that is growing in importance in our economy and society. Our sports management program is one of the few in the country that is housed within a business management department, so we offer our students the opportunity to gain important business management skills while learning about the unique nature of sports organizations.

Option in Business Sustainability. A sustainable enterprise is built around the triple bottom line imperative of protecting and enhancing the current and long-term future of the organization, the quality of life of the people impacted by the organization, and the health of the natural environment. There is a growing need for individuals with training in sustainable enterprise, and the job opportunities for well-trained undergraduates are increasing. The Business Sustainability option prepares students for this growing and exciting field with extra class work in business ethics, corporate social responsibility, and sustainable business practices.

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 (MBA) Degree. (See "Business Administration.")

Graduate Certificates

Certificate in Nonprofit Management

A growing number of executives in non-profits are recognizing the need to incorporate contemporary management skills into their organizations. This certificate is designed to highlight management practices used in traditional businesses that can also be applied in the nonprofit context and explore the important interface between for-profit businesses and nonprofit organizations. This certificate is aimed at working professionals who typically join organizations at entry to mid-level management positions without prior business management education. The certificate offers a range of courses that will enable students to apply business practices in nonprofit organizations. Those seeking the graduate certificate will complete 6 hours of required coursework and select another 6 hours of coursework that best fits their situation.
Certificate in Sustainable Business

A sustainable enterprise is built around the triple bottom line imperative of protecting and enhancing the current and long term future of the organization, the quality of life of the people impacted by the organization, and the health of the planet. A combination of factors has made a focus on sustainability no longer an option for organizations—whether public, private, or governmental. First, from a cost perspective, managers must recognize that their actions (whether proactive or inactive) that negatively impact people (e.g., its shareholders, employees, customers, communities) can lead to lawsuits. Similarly, by reducing the waste that harmful to the planet, organizations can minimize cost. Second, from a revenue perspective, the development of green products can provide a competitive advantage in the marketplace. Third, from an ethical perspective, it is simply the right thing to do to protect the planet as well as present and future generations of people from the negativeexternalitysof anorganization’s actions. We are building these ideas into both our undergraduate and graduate management programs.

The Doctor of Philosophy Degree. The PhD in business administration program administered through the Department of Management prepares students for a career in university research and teaching. The program is flexible and individually structured to meet the needs and objectives of the candidate. Emphasis is placed on understanding the psychological, social and economic foundations of business administration and developing the analytical skills to publish research in the management specialties of organizational behavior, human resources and strategic management.

PhD students in management concentrate in either organizational behavior or strategic management and pursue two minors. At least one of the minor areas must be taken in the Spears School of Business. As support for the major and minor fields of study, each student is required to attain graduate-level competence in quantitative research methods.

As prerequisites to the program, all candidates must have completed appropriate basic courses in calculus and statistics. In addition, candidates are expected to have a basic competence in the major functional areas of business—accounting, finance, management, management information systems, management science, and marketing. Competence in the functional areas is usually demonstrated through the completion of appropriate graduate courses in each area through a program accredited by the Association to Advance Collegiate Schools of Business (AACSB International).

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 of the dissertation itself. To enhance teaching skills, all PhD students are required to teach one quarter-time or half-time basis for at least one semester while earning the degree.

Outstanding students with master’s degrees in any field of study are encouraged to 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 research 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.

Management Science and Information Systems

Rick L. Withrow, PhD—Professor and Head

There is little doubt that emerging technologies of the 21st Century will continue to alter dramatically the way business is conducted. Those who wish to have a leadership role in developing next generation systems should consider a career in information systems and telecommunications. The need for knowledgeable workers with expertise in information systems will continue to increase and will be substantial rates for the foreseeable future. In fact, a Department of Labor forecast projected that a bachelor’s degree in the management science and information systems area will prepare students for five of the top eight fastest growing occupations over the next decade.

The Department of Management Science and Information Systems offers an undergraduate major in management information systems (MIS) with possible options of management science and computer systems (MSCS) and information assurance (IA). It also offers graduate studies leading to master’s degrees in telecommunications management (MSTM) and management information systems (MIS). Also, PhD degrees in business administration with an option in MIS, telecommunications management, management science and operations management can be earned.

Undergraduate degrees in MIS require a common foundation of work in disciplines such as mathematics, statistics, behavioral sciences and communications. A second tier of required work consists of the courses required for all Spears School of Business students such as economics, marketing, accounting and management. The third tier of classes are core MIS courses that develop information technology expertise in students.

Management Information Systems (MIS). The MIS degree focuses on the business applications of information technology. This includes emphasizing necessary skills required in the analysis, development, evaluation and implementation of various information and communication technologies critical for today's Internet-enabled organizations. The integration of information technology throughout all aspects of business coupled with the critical need for responsive information systems has created a strong demand for graduates with expertise in information systems and business administration.

MSCS. The MSCS option allows developing aptitudes in quantitative tools that are especially critical in today's data-driven organization. Additional course work in statistics, operations research, decision analysis and quantitative analysis is possible with an MSCS option.

Information Assurance. The Information Assurance option uses the expertise of the counseling standard that led OSU to be named a Center of Academic Excellence in Information Assurance Education and Research by the NSA and the Department of Homeland Security. This option provides students with in-depth study and hands-on analysis of critical organizational issues in information assurance and security.

Graduate Programs

The Department of Management Science and Information Systems offers courses that lead to the completion of the Master of Business Administration (MBA), the Master of Science in telecommunications management (MSTM), the Master of Science in management information systems (MIS) and the Doctor of Philosophy in business administration (PhD).

The Master of Business Administration (MBA) Degree. (See "Business Administration.")

The Master of Science in Telecommunications Management (MSTM) Degree. In response to industry's need for skilled and knowledgeable telecommunications management graduates, Oklahoma State University offers a Master of Science in telecommunications management (MSTM). 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 program is currently housed in the Spears School of Business. However, the telecommunications management program draws on the combined expertise of three OSU colleges—the College of Arts and Sciences, the Spears School of Business 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 an understanding of other related knowledge and communicating with other 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 employed by providers or users of telecommunications technologies.

Telecommunications Management Curriculum. The program curriculum consists of 32-33 credit hours, including eight core courses 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 complete it in two years.

MSTM degree candidates have the opportunity to develop broad knowledge in specific elective areas chosen to best fit their career aspirations.

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.

Information about the program is available on the Internet at spears.okstate.edu/graduate/mstm.

The Master of Science in Management Information Systems (MIS) Degree. This degree program combines strong theoretical concepts with intensive hands-on experience not only to develop graduate students' expertise in business processes and the concepts behind the information systems they work with, but also develop, modify, use and protect these rapidly-changing computing systems through their technical expertise.

The MS in MIS is a 33-34 hour program featuring a core of 25 hours (24 for part time) covering a business problem, plus two options to highlight different interest areas: data science and application development. These options afford the student opportunities to focus on descriptive, predictive and prescriptive analytics as well as software design and implementation.
Admission requirements for the MS in MIS are similar to the admission requirements for the other master’s programs in the Spears School of Business. Information about the program is available on the Internet at http://mis-analytics.okstate.edu.

The Doctor of Philosophy (PhD) Degree. The PhD in business administration program administered through the Department of Management Science and Information Systems provides intensive study in management information systems, management science, operations management and telecommunications management. It prepares the student for significant professional contributions in university teaching and research.

The program is flexible and individually structured to meet the needs and objectives of the candidate. Emphasis is placed on understanding the analytical and theoretical foundations of business administration, applications in the depth area of specialization and development of research capabilities in the discipline. As prerequisites to the program, all candidates are to have completed appropriate basic courses in calculus and statistics. Likewise, candidates are expected to have had basic competence in the major functional areas of business—accounting, finance, management, management information systems, management science and marketing. Competence in the functional areas is usually attained by documenting that the student has recently completed the appropriate graduate courses in each area through a program accredited by the Association to Advance College Schools of Business (AACSB International).

Competence in planning and executing research must be demonstrated in a dissertation. In addition, each candidate must pass a series of comprehensive qualifying examinations, written and oral, and a separate, final oral examination of the dissertation. In addition, teaching experience in residence is required to teach on a quarter-time 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.

School of Marketing and International Business
Joshua L. Wiener, PhD—Professor and Head

The School of Marketing and International Business provides two quite significant majors within the Spears School of Business. One of these is marketing. This is an exciting field of study leading to a variety of job opportunities both in the private sector and in not-for-profit organizations. Also, it provides an excellent career path to top management within an organization.

The second major provided by the department is international business. Almost every business has international operations or is affected by events, competitors and conditions in the global economy. This opens career opportunities in almost every business. Many undergraduate students join organizations at entry-level positions where the focus is on customer-related activities, including sales, retail, and customer service. Such training will benefit not only students who plan to go on to graduate school, but also those who will eventually practice law, medicine, or own their own business where successfully managing customer interactions forms the foundation for success.

The certificate offers a range of courses to give specialized training on effective customer interaction. All required coursework fits within the structure of the marketing undergraduate degree program. Those seeking the certificate will complete 9 hours of required coursework and select another 6 hours of coursework that best fit their particular interests.

International Business. The international business degree is a cross-disciplinary program of study that provides a solid, broad-based foundation of business coupled with the flexibility to tailor the program to the individual student’s specific interests. International business majors can choose to focus on specific areas or regions of the world by including professional coursework in political science courses complemented by study of a foreign language important in that region. International Business majors can also increase their knowledge and abilities of a specific business discipline by adding a business minor. For international business students, the world truly is their oyster.

Many international business majors are interested in taking advantage of the opportunities afforded by Oklahoma State University to either study abroad or complete an international internship. The Cagle Center is the Spears School of Business’ launching pad for taking short-term, faculty led study abroad trips to exciting locations such as China, England, France, Greece and many other locales. OSU’s study abroad office, located in the Union, is a great place to get involved in taking advantage of the opportunities OSU study abroad offices provide. Students will surprise you is the amount of financial assistance for which you can apply. When you stop by the Cagle Center or the OSU study abroad office, make sure to ask about scholarship and grant programs that can make your dreams come true.

To earn an international business degree, you will complete 120 hours of undergraduate coursework. In addition to foundational coursework in accounting, economics, finance, management, management information systems, marketing, you will have the opportunity to take 15 hours of upper division, internationally-focused business courses. See the degree requirements for the international business major for more information.

Graduate Programs

The School of Marketing and International Business offers work leading to the Master of Business Administration, the Master of Business Analytics and the Doctor of Philosophy in business administration degrees. In addition, the School of Marketing and International Business offers work leading to Graduate Certificate in Business Data Mining and Graduate Certificate in Marketing Research.

The Master of Business Administration (MBA) Degree. (See “Business Administration.”)

The Master of Science in Business Analytics Degree. This is an interdisciplinary program that offers hands-on application of data analysis along with a unique blend of coursework in Analytics, Marketing, Statistics, Business, MIS and Industrial Engineering. The structure of the curriculum has been carefully designed in consultation with our advisory board companies to balance the need of understanding quantitative approaches, statistical modeling and machine learning algorithms along with data visualization and exploration, interpretation of results and the ability to apply these results for solving business problems.

The MS in Business Analytics is a 37 hour program featuring a core of 25 hours (18 for part time), including a business practicum. The 12 hours of electives allow students to specialize in areas such as business, statistics, information science or industrial engineering. In addition to the MS in Business Analytics degree, students in this program may also receive one of three certificates depending on elective courses taken, credentials achieved and so on: SAS® and OSU Data Mining Certificate (core level), SAS® and OSU Predictive Analytics Certificate (advanced level) and SAS® and OSU Marketing Data Science Certificate (expert level).

Admission requirements for the MS in Business Analytics are similar to the admission requirements for the other master’s programs in the Spears School of Business. Information about the program is available on the Internet at http://analytics.okstate.edu/msba/.

The Doctor of Philosophy Degree. The PhD in business administration program administered through the School of Marketing and International Business 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 encourage 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.

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Program Content. The student will take 15 hours of PhD 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.

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 MBA program accredited by the Association to Advance Collegiate Schools of Business (AACSB).

Application Procedure. Outstanding undergraduate or graduate students from any field of study may apply. For those with an MBA, the program will normally consist of two years of course work and two years of dissertation work. For those without a master’s degree, the plan of study for the PhD degree will typically allow for the granting of an MBA prior to completion of the PhD 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 recommendation, (5) evidence of research potential and (6) a personal interview when feasible. It is the responsibility of each applicant to ensure that all materials related to the above criteria are received by the School of Marketing and International Business. Application forms and detailed explanation of the PhD degree in business administration with an emphasis in marketing are available through the department.

Graduate Certificate in Business Data Mining. This certificate program is designed to help working professionals with technical background who do not want to pursue a full master’s degree yet want to acquire data mining or predictive analytics skills by taking a series of courses online. Working professionals admitted in this program can complete coursework in 12-24 months by taking courses online. Those enrolled in the graduate certificate in business data mining may be able transfer the credit hours to the MS in Business Analytics if they choose to apply for admission into the MS degree at a later date. Along with the graduate certificate in business data mining, students in this program may also receive all of the following three certificates (depending on courses taken, credentials achieved, etc.): SAS and OSU Data Mining Certificate (core level), SAS and OSU Predictive Analytics Certificate (advanced level) and SAS and OSU Marketing Data Science Certificate (expert level).

More details about this program (including application procedure and admission requirements) are on the website: http://analytics.okstate.edu/certificate/grad-data-mining/program/.
At the time of application, the applicant must have an overall grade-point average of at least 3.0 (on a 4.00 scale), a pre-professional science GPA of at least 2.75, and a minimum score of 492 on the Medical College Admissions Test (MCAT). All applicants must take the MCAT. They are encouraged to take the examination in the spring of the year prior to making application. Under special circumstances, the College may use discretion to admit students who do not meet these minimum requirements. At the time of entry, 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, with no grade below a "C" (2.00 on a 4.00 scale):
   - English (six semester hours)
   - Biology (eight semester hours), including laboratory
   - Physics (eight semester hours), including laboratory
   - General chemistry (eight semester hours), including laboratory
   - Organic chemistry (eight semester hours), including laboratory
   - Applicants must have taken at least one upper-division (3000–4000 level) science course, including laboratory. Examples include, but are not limited to: biochemistry, comparative anatomy, cellular biology, embryology, histology, microbiology or molecular biology, histology, physiology, and genetics.

The annual application deadline is February 28. The deadline for supplemental application materials is March 30.

An on-campus interview with the Applicant Interview Committee is by invitation only. Interviews are conducted by clinical and basic science faculty members, as well as alumni. 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 115 students (in 2016).

OSU-COM seeks to admit students who want to become primary care physicians in rural and underserved Oklahoma. The Rural and Underserved Primary Care Early Admissions Program allows students who want to become dedicated primary care physicians practicing in rural and underserved Oklahoma to complete undergraduate and pre-doctoral training in seven years. For more information on the Early Admissions Program, please visit www.healthsciences.okstate.edu/com/admissions/options.php

**Selection Factors**

The College considers applications for admission from all qualified candidates. Oklahoma State University Center for Health Sciences prohibits discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination against all individuals based on their age, race, color, religion, sex, sexual orientation, gender, gender identity, national origin or ethnicity. Preference is given to Oklahoma residents.

Applicants must be U.S. citizens or permanent residents of the U.S. Non-U.S. citizens must have a permanent resident visa (“green card”) at the time of application in order to be considered for admission.

**College Curriculum**

The curriculum at the OSU College of Osteopathic Medicine places significant focus on primary care. The four-year program emphasizes the integration of biomedical sciences with clinical systems. The curriculum includes early hands-on clinical experiences with patients, patient models, and simulations. Instructional methods are student-centered and include traditional lecture, and small group and team-based learning. Problem-solving and information retrieval skills are emphasized to produce and develop skills that support lifelong learning.

The culture of OSU College of Osteopathic Medicine encourages students to establish an academic relationship with faculty members and community-based physicians. The curriculum emphasizes integration of biomedical with clinical and behavioral sciences to permit the full comprehension of the clinician's work and promote a holistic approach to the care of patients and their families. Students receive training in all areas of medicine, with additional emphasis on osteopathic manipulative medicine. Incorporated within the OSU-COM curriculum is a Rural Medical Track (RMT) that stresses the unique nature and characteristics of a rural practice, provides a pathway for student matriculation into a rural primary care residency, and supports residency graduates in the establishment of a practice in a rural or underserved location.

The first semester focuses on the foundations of biomedical and clinical sciences along with an introduction to patient care. Starting in the second semester and continuing through the end of the second year, students are introduced to a total of 13 clinical systems that year program emphasizes students for addressing conditions typically seen in the primary care environment. The third and fourth years are comprised of clinical rotations, which are community based, consisting of clerkship experiences in hospitals and clinics where students observe patient care and participate in the evaluation and treatment of patients under physician faculty supervision. In the Clerkship Program, students are required to complete 22, four-week rotations in the core areas of family medicine, osteopathic manipulative medicine, pediatrics, internal medicine, surgery, obstetrics-gynecology, psychiatry and emergency medicine. In addition to the...
core rotations, students are also required to complete three rotations at affiliated teaching sites in rural communities, two of which are focused on gaining experience in a rural hospital setting. Students must also complete two primary care electives, seven general electives, and one required vacation. Many rotations are completed at the OSU Medical Center in Tulsa, one of the largest osteopathic hospitals in the United States. Furthermore, students enrolled in the rural Medical Track Program take our mission to serve rural Oklahoma to new heights. The Rural Medical Track Program is designed to allow students to complete nearly all rotations more than six months of the core rotations in rural communities. In addition to the core rotations, the Rural Medical Track students must also complete at least two sub-internships with rural residency programs, as well as two sub-specialty electives.

Students graduate from the four-year program with the Doctor of Osteopathic Medicine (DO) degree. Students administer more than half of graduates enter primary care, graduates are prepared to enter residencies in all medical specialty fields. This training period lasts a minimum of three years with several specialties requiring up to five years of postgraduate education. To see a full list of residency programs, our recent graduates have entered their residency acceptance data, along with OSU-COM’s pass rate on the COMLEX-USA, please visit: see: http://www.healthsciences.okstate.edu/com/admissions/graduates.php

Accreditation

The college is accredited by the Commission on Osteopathic College Accreditation (COCA) 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

Financing a medical education should be seriously considered. The primary responsibility for meeting a student’s educational costs rests with the student and his/her family. The Office of Student Financial Aid makes every attempt to assist students financially.

The Office of Student Financial Aid supports the mission of the University by enabling students and families to reduce or eliminate financial barriers that might prohibit their participation in the programs offered by OSU Center for Health Sciences. The office administers need-based financial aid programs funded by federal, state, University, and private sources in the form of Federal Stafford loan, Graduate PLUS loan, employment, as well as need- and merit-based scholarships. The office also administers the Federal non-need based loan programs (Unsubsidized) and provides information and support to students interested in the alternative loan options available to them.

Tuition and fees at the College of Osteopathic Medicine (for the 2016-2017 school year) totals $24,926* per year for Oklahoma residents and $48,717* per year for out-of-state residents. (*subject to change)

Most financial aid is renewable on an annual basis, provided there is adequate funding and the student remains eligible (enrolled in a matriculated program, in good academic standing, and with continued need for need-based aid). To qualify, each student should file the Free Application for Federal Student Aid (FAFSA) by Feb. 15. Students are encouraged to continue to file after this date; however, consideration for funds will be based on a first-come basis.

The FAFSA and other required applications may be obtained by contacting: Office of Financial Aid - OSU College of Osteopathic Medicine; 111 West 17th Street, Tulsa, OK 74107-1898; Students may apply online at www.fafsa.gov/ (School code is G11282).

Graduate Education

The Center for Health Sciences offers graduate degree programs in Biomedical Sciences, Forensic Sciences, Health Care Administration and Athletic Training. The Biomedical Sciences Graduate Program offers PhD, MS, DO/MS and DO/PhD degree programs. These programs provide students with a foundation in biomedical sciences that is broadly applicable to many disciplines, including anatomy, biochemistry, cell biology, microbiology, pathology, pharmacology and physiology.

The Master of Science in Forensic Sciences requires a minimum of 39 credit hours with the thesis option and a mix of hybrid courses, usually offered between four to five years while maintaining full-time careers. This degree is designed for individuals pursuing careers in crime labs, investigative agencies or research institutions.

The Master of Science in Health Care Administration consists of 32 total hours with a creative component or thesis including six hours of general graduate level electives. The degree is an option in healthcare leadership and entrepreneurship or an option in administration. The curriculum provides exposure to management concepts, processes and techniques associated with administration and entrepreneurship functions in a variety of health care organizations. This degree is also a good option for those individuals who wish to move into management or executive positions; however, healthcare experience is not required. This degree offers on-site courses at OSU-Stillwater and OSU-Tulsa as well as distance learning opportunities. This degree can be completed on-campus or online.

The Master of Science in Biomedical Sciences offers a thesis and non-thesis option, with both programs designed to be completed in two years with six elective hours taken in the summer. The Master of Athletic Training Program is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). Once accepted into the program, students are assigned to a Board of Certification (BOC) Certified Athletic Trainer (AT) where they are responsible for providing for the overall health care of patients over the course of their respective seasons or occupation.

Clinical instruction of students is achieved through direct supervision of a licensed physician and the athletic trainer. The curriculum is based in the human sciences with anatomy, physiology, biomechanics, pathology, pharmacology, nutrition and psychology providing the theoretical foundation of student instruction.

Students learn how to apply these theoretical concepts while in the clinical setting learning under licensed physicians, athletic trainers, physical therapists and other allied health care professionals. This balance of theory and practical application prepares students to sit for the Board of Certification examination where upon successful completion, may earn the credentials ATC. Additional information about these programs can be found at: http://www.healthsciences.okstate.edu/com/catalog.php

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 Scrub Run. Listed below are official student organizations.

American College of Osteopathic Emergency Physicians (ACOEP)
American College of Osteopathic Family Physicians (ACOFP)
American College of Osteopathic Pediatricians (ACOP)
American Medical Student Association (AMSA)
Association of African American Medical Students (AAAAMS)
Association of Military Osteopathic Physicians and Surgeons (AMOPS)
Association of Native American Medical Students (ANAMS)
Atlas Fraternity - social
Biomedical Science Graduate Student Association (BSGSA)
Campus Recreation and Wellness
Christian Medical Association (CMA)
Clark S.P.I.N.E. - fundraising for Eugene Field Elementary Forensic Science Organization (FSO)
Gay & Lesbian Advocacy in Medicine (GLAM)
Health Innovation, Technology, and Entrepreneurship Club (HITEC)
International Federation of Medical Students' Associations (IFMSA)
Kappa Pi - professional
Los Angeles Osteopathic Association
Manchester Osteopathic Association
Medical Student National Honor Society (MSNHS)
National Honor Society (NHS)
National Osteopathic Medical Association (NOMA)
National Society of Latino Osteopathic Physicians (NSLOP)
National Student Physicists' Association (NSPA)
National Zoological Society of America (NZSAA)
Oklahoma Osteopathic Obstetricians and Gynecology Student Association
Pathology & Laboratory Medicine (PLM)
Pros For Africa (PFA)
Prosperity Student Association (SSA)
Society for Career Opportunities and Professional Exploration (SCOPE)
Student American Academy of Osteopathy (SAAO)
Student American Osteopathic Academy of Orthopedics (SAAO)
Student Association Auxiliary (SAA)
Student Association of Native American Medical Students (ANAMS)
Student American College of Osteopathic Pediatricians (ACOP)
Student Government Association (SGA)
Student Interest Group in Neurology (SIGN)
Student National Medical Association (SNMA)
Student Osteopathic Medical Association for Physical Medicine (SOMAM)
Student Osteopathic Association of Radiology (SOAR)
Student Osteopathic Association of Research
Student Osteopathic Internal Medicine Association (SOIMA)
Student Osteopathic Orthopaedic Association (SOOA)
Student Osteopathic Physical Medicine and Rehabilitation Association
Student Osteopathic Psychiatry Association (SOAPA)
Student Osteopathic Research Association (SORA)
Student Osteopathic Uromed Club
Student Osteopathic Surgical Association (SOASA)
Student Political Action Committee
Wilderness Medical Society (WMS)
Doctor of Veterinary Medicine Program
A primary objective of the Center for Veterinary Health Sciences is to educate veterinarians for private practice. In addition, the professional curriculum provides an excellent basic biomedical education and 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 11 essential factors, namely, the college's organization, its finances, facilities and equipment, clinical resources, library and learning resources, enrollment, admissions, faculty, curriculum, continuing and post-graduate education, and research.

Preparatory Requirements
In preparation for the professional DVM training the student must complete both prescribed and elective collegiate courses. The minimum prescribed prepratory studies, totaling 64 semester hours of undergraduate course work, can be completed in three calendar years. Most of the entering veterinary medicine students in recent years have had three to four years of preparatory training, often earning a bachelor's degree.

Admission Requirements
Collegiate course requirements for entry into veterinary medical college may be completed at any accredited university or college that offers the required courses. Pre-veterinary curricula are available at Oklahoma State University through the Division of Agricultural Sciences and Natural Resources and through the College of Arts and Sciences. Both offer programs of study in pre-veterinary medical sciences, which provide for the award of a bachelor's degree after successful completion of the first or second year of veterinary medical studies. Requests for information on pre-veterinary medical studies and applications for admission to such programs should be addresed to the dean of either the Division 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 Center for Veterinary Health Sciences:

English —nine semester hours including six hours of composition and three hours of an English elective. Course work in speech or technical writing is encouraged.

Chemistry — general inorganic chemistry including labs (9 hours); an organic chemistry series (8 semester hours) designed for pre-veterinary and pre-medical students that includes both the aliphatic and aromatic compounds or survey course with lab (5-8 hours); and 3 semester hours of biochemistry.

Physics — Eight hours of general physics.

Mathematics — three semester hours. Minimum level of college algebra or higher math. Course work in statistics is not acceptable.

Biological science — 16 semester hours. Courses in zoology, general biology, microbiology and genetics are required. These courses must include laboratory work.

Animal Nutrition — three semester hours of the basic principles of animal nutrition, including digestion, absorption and metabolism of the various food nutrients and ration formulation. Courses in human nutrition are not acceptable.

Humanities and social science — six semester hours.

Business electives — although not required, courses in business are encouraged.

The information on admission requirements were current at the time of publication but is subject to change. The admission requirements are under annual review and changes may be made at any time.

Scholarships
The College has scholarships which may be available to matriculating veterinary medicine students; most are based on academic achievement.

Application Process
Admission is competitive and enrollment in veterinary medicine is restricted. Applications for admission must be submitted by September 15th, and a new class enters the College each year at the beginning of the subsequent fall semester.

Applicants who are legal residents of Oklahoma will be given first priority. In addition, a limited number of nonresidents will be selected. Questions about residency should be directed to the Office of the Registrar, Oklahoma State University. Requests for application materials should be directed to the Student Services Office, Center for Veterinary Health Sciences.

Students are admitted as candidates for the Doctor of Veterinary Medicine degree on the basis of records of academic performance in preparatory studies, GRE test, and references to determine personal characteristics and career motivation. Details concerning admissions procedures are available via the Center for Veterinary Health Sciences website www.cvhs.okstate.edu.

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 completion of the third. The fourth year is clinical in nature and classes are primarily in the Boren Veterinary Medical Teaching Hospital. The fourth year is organized into three-week rotations to provide for lower faculty-student ratio and more efficient use of clinical facilities and resources.

Veterinary Medical Research Scholars
Thanks to opportunities in research for veterinary students at OSU, those receiving degrees can qualify for 'veterinary medical research scholar designation' on the transcript, a valuable designation to achieve. To be considered, the student must:

a. For a minimum of two semesters or in full-time summer employment, be engaged in and contribute substantively to research or creative inquiry with a faculty mentor and/or faculty-led team. The supervising mentor may be employed at Oklahoma State University or at another university.

b. Present his or her research or creativity project at a state, regional or national conference or juried artistic venues such as art exhibitions, concerts, or festivals.

c. Publish his or her work or a manuscript related to the creativity product in a refereed research or professional journal (or have it accepted for publication).

Applicants should apply through the Office of the Associate Dean for Academic Affairs, Center for Veterinary Health Sciences and Recognition at least six weeks before the end of their studies at OSU. A committee appointed by the Faculty Council will examine the materials and determine whether or not the candidate will be approved and recognized.

For further information contact the office at 405.744.6595 or email chris.ross@okstate.edu.

Veterinary Biomedical Sciences Graduate Program
Pamela Lloyd, PhD — Associate Professor and Coordinator of Graduate Studies

The veterinary biomedical sciences (VBS) graduate program is a multidisciplinary program intended to provide students a broad base of research areas to address individual student interests. The program is administered within the Center for Veterinary Health Sciences but may involve faculty from other colleges. Programs of research and study leading to the degrees of Master of Science and Doctor of Philosophy are available within the broad areas of focus: infectious diseases, pathobiology, and physiological sciences. The program is designed to prepare individuals for careers in teaching and research, and specialization is possible within each area dependent upon student and faculty interests and available funding.

Current areas of research focus include molecular, cell and developmental biology, clinical sciences (including laser applications and oncology); infectious and parasitic diseases (including vector-borne diseases, bacterial and viral diseases in wild and domestic animals); pathobiology; and toxicology. Faculty and their specific areas of interest are available through the graduate coordinator (vbsc@okstate.edu) or online at cvhs.okstate.edu/Graduate Program.

Prerequisites: Candidates for admission must possess a bachelor's degree or equivalent, with a background in biological or physical sciences. Although there
are no absolute performance level requirements, applicants with quantitative GRE scores at the 75th percentile or greater and GPAs of 3.0 (out of 4.0) or greater, will receive strongest consideration.

The Master of Science Degree. The MS may be earned with 30 credit hours beyond a Bachelor's degree or 21 hours beyond the DVM degree, including not more than six credit hours for the thesis. The plan of study is designed to meet the student's needs and interests and typically includes two credits of seminar, one course in statistics, and courses in molecular or cell biology and pathophysiology. The student must also pass a final oral examination covering the thesis and related course work.

The Doctor of Philosophy Degree. The PhD requires a minimum of 60 credit hours beyond the Bachelor's or DVM degree, including up to 45 credit hours for research and dissertation. The plan of study is designed to meet the student's needs and interests and typically includes courses in cell and molecular biology, pathophysiology, statistics and seminar. Written and oral qualifying examinations are required. Students must prepare a research proposal and complete and defend a dissertation based on original research.

Application Procedure: Applications are made to the Graduate College (http://www.gradcollege.okstate.edu/apply) and are accepted at any time; however, all documents should be received by March 1 for admission to the fall semester. Applicants are required to submit official transcripts of all college-level work and scores for the GRE general test. International applicants are required to take an English proficiency exam TOEFL or equivalent exam, unless a student is from a country where English is a first language. For students seeking graduate teaching assistantships, a score of 22 or greater on speaking part of the internet-based TOEFL (iBT) is required. In addition, the applicant will submit a statement of purpose stating their preparation for graduate study as well as how earning a graduate degree will further their educational and career goals and will have three persons knowledgeable of their preparation for graduate study write and submit letters of reference.

Information about faculty research interests is available upon request to the graduate coordinator (vbsc@okstate.edu). After acceptance to the graduate program, students select a major professor and an advisory committee and develop a plan of study consistent with the VBS graduate program requirements and subject to approval of the dean of the Graduate College.

Assistantships: A limited number of graduate teaching and research assistantships are available.

Internship and Residency Programs: Internships and residency programs in clinical medicine and surgery are offered through the Department of Veterinary Clinical Sciences. Residency programs in pathology are offered through the Department of Veterinary Pathobiology.

Veterinary Clinical Sciences
G. Reed Holyoak, DVM, PhD, DACVT—Bullock Professor and Department Head

Internship and Residency Programs. The department offers graduate professional programs (internships and residencies). Internships are one-year post-DVM clinical programs in small or large animal medicine and surgery. Internships are designed in part to prepare students for residencies or graduate academic programs. Currently internships are offered in small animal medicine and surgery, equine internal medicine and surgery, therapeutic, food animal medicine and surgery, zoological medicine, and diagnostic imaging.

Residencies are three-year clinical programs in various disciplines designed in part to prepare for specialty board certification. Currently, residencies are offered in small animal surgery, small animal internal medicine, equine internal medicine, equine surgery, food animal medicine and surgery, ophthalmology, and therapeutic. Graduate academic programs may be available in association with residencies.

Application Procedure. Applications are accepted at any time and are considered as positions become available. Most open positions are listed in the Veterinary Internship/Residency Matching Program at www.virmp.org.

Veterinary Pathobiology
Jerry Ritchey, DVM, PhD, DACVP—Professor and Department Head

Residency Coordinators: Dr. Melanie A. Breshears, Anatomic Residency Coordinator and Dr. James H. Meinkoth, Clinical Residency Coordinator

Residency programs in anatomic and clinical veterinary pathology are offered. Candidates must have the DVM degree or equivalent. The anatomic and clinical pathology residency programs are three years with options to enter into the PhD program. The programs are designed for those interested in diagnostic veterinary pathology and board certification by the American College of Veterinary Pathologists. Residency training occurs through the Veterinary Medical Teaching Hospital and through the Oklahoma Animal Disease Diagnostic Laboratory. The program involves extensive diagnostic casework on primarily domestic animals and includes weekly case conferences and seminars. In addition, abundant archived materials are available for the specialty board preparation.

Application Procedure. Usually one new residency training position is available each year in anatomic pathology and two of every three years in clinical pathology. Open positions are listed at the ACVP website (http://www.acvp.org/) and typically in the “Educational Opportunities” section of the Journal of the American Veterinary Medical Association.
University Faculty

College of Agricultural Sciences and Natural Resources

Agricultural Economics

Mike Woods, PhD—Professor and Head

Regents Professors: B. Wade Bровsen, PhD; Danica G. Doyne, PhD; Francis E. Epplin, PhD; Shida R. Hennemeyer, PhD; Phil Kenkel, PhD; Jason L. Lusk, PhD

Professors: Brian Adam, PhD; Chuanhlin Chung, PhD; Cynda R. Clary, PhD; Cheryl S. De Vuyyst, PhD; Eric De Vuyyst, PhD; Shida R. Hennemeyer, PhD; Rodney Holcomb, PhD; Notie H. Lanzford, PhD; Ron O. Love, PhD; F. Bailey Norwood, PhD; Derrill S. Peel, PhD; Larry D. Sanders, PhD; Raymond J. Schatzar, PhD; James N. Trapp, PhD; Brian Whitacre, PhD; Michael D. Woods, PhD

Associate Professors: Tracy Boyer, PhD; Shannon Ferrell, JD; Rodney Jones, PhD; Kelli Raper, PhD; David Shideler, PhD; Arthur Stoecker, PhD; Jeff Vitale, PhD

Assistant Professors: Richard T. Melstrom, PhD; John Michael Riley, PhD

Agricultural Education, Communications and Leadership

Robert Terry, Jr., PhD—Professor and Head

Professors: D. Devayne Cartmell, PhD; M. Craig Edwards, PhD; James P. Key, EdD (emerit-us); J. Shane Robinson, PhD; Shelly R. Sitton, PhD; Penny P. Weeks, PhD; William G. Weeks, PhD

Associate Professors: Jon W. Ramsey, PhD; Jeff Sallee, PhD

Assistant Professors: Marshall Baker, PhD; Traci Naile, PhD; Angel Riggs PhD

Agriculture (general)

Professor and Associate Dean, Academic Programs: Cynda R. Clary, PhD

Professor and Interim Assistant Dean, Academic Programs: Karen Hickman, PhD

Professor and Interim Assistant Dean, Academic Programs: Deborah Van Overbeke, PhD

Interim Director, International Agricultural Programs: Adele Tongco, PhD

Regents Professor and Director, Masters of Agriculture in International Agriculture: Shida R. Hennemeyer, PhD

Coordinator, Prospective Student Services: Kristi Bishop, MS

Coordinator, Student Success: Amy Ganzaway MS

Coordinator, Student Success: Katie Smithson, MS

Graduate Certification: Carol Hoikemiecz, BS

Animal Science

Clint Rusk, PhD—Professor and Head

Clint Krehbiel, PhD—Regents Professor and Assistant Head

Professors: W. Stephen Damron, PhD; Gerald Q. Hitch, PhD; Gerald W. Horn, PhD; David L. Lalman, PhD; Gretchen Mafi, PhD; Peter Mariana, PhD; Leon J. Spicer, PhD; Deb Van Overbeke, PhD; Guolong Zhang, PhD

Associate Professors: Scott Carter, PhD; Steven Cooper, PhD; Udaja DeSilva, PhD; Mark Z. Johnson, PhD; Chris Richards, PhD; Ryan Reuter, PhD; Dan Stein, PhD

Assistant Professors: Blake Bloomberg, PhD; Kris Hiney, PhD; Ravi Judea, PhD; Divya Jaromi, PhD; Joshua Payne, PhD; Adel Pezeshki, PhD; Sara Place, PhD; Ranjith Ramanathan, PhD; Blake Wilson, PhD

Assistant Extension Specialists: Rusty Goz, MS; Gant Mours, MS

Coordinator, Student Success: Carrie Doyle, MS

Biochemistry and Molecular Biology

John E. Gustafson, PhD—Professor and Head

Regents Professors: Robert L. Matts, PhD; Andrew J. Mort, PhD

Professors: Randy D. Allen, PhD; Patricia Canaan, PhD; Junpeng Deng, PhD; Patricia Rayas-Duarte, PhD; Jose L. Souldes, PhD; Ramanjulu Sunkar, PhD

Associate Professor: Rita Miller, PhD

Assistant Professors: Charles Chen, PhD; Donald Rahi, PhD; Kevin Wilson, PhD

Associate Research Professor: Estela L. Arrese, PhD

Associate Research Scientists: Steven D. Hartson, PhD; Peter R. Hoyt, PhD

Instructor: Judy A. Hall, MS

Adjunct Faculty: Robert L. Burnum, PhD; Richard A. Dixon, PhD; Udapa DeSilva, PhD; Hainbo Jiang, PhD; Veronique A. Lacombe, PhD; Jerry R. Malaguy, PhD; Kenneth L. McNally; Nima Mohanty, PhD; Carey Pope PhD; Roll A. Prade, PhD; Kay Scheets, PhD; Lloyd Sumner, PhD; William Schneider; Million Tadege, PhD; Jeanmarie Verchot, PhD; Guolong (Glenn) Zhang, PhD

Professors Emeriti: Chang-An Yu, PhD; Linda Yu, PhD; Margaret Essenberg, PhD; Franklin Leach, PhD; Richard Essenberg, PhD; Ulrich Melcher, PhD; Sharon Ford, PhD; Earl D. Mitchell, PhD; Robert Gholson, PhD; Eldon C. Nelson, PhD

BioSystems and Agricultural Engineering

Daniel L. Thomas, PhD—Professor and Head

Regents Professor: Glenn O. Brown, PhD, PE

Professors: Danielle D. Bellmer, PhD; Timothy J. Bowser, PhD, PE; Nurhan Dunford, PhD, PE; Gary A. Fox, PhD, PE; Raymond L. Huhneke, PhD, PE; Daniel E. Storm, PhD; Randall K. Taylor, PhD, PE; Ning Wang, PhD, PE; Paul R. Weckler, PhD, PE; Mark R. Wilkins, PhD, PE

Professors Emeriti: Ronald L. Elliott, PhD, PE; Michael D. Smolen, PhD

Adjunct Professors: Jurgen Garbrecht, PhD; Gregory J. Hanson, PhD, PE; Randy Raper, PhD

Associate Professors: Douglas W. Hamilton, PhD, PE; Carol Jones, PhD, PE; Yu Mao, PhD; Jason R. Vogel, PhD

Adjunct Associate Professors: George Sabbagh, PhD; Joshua B. Payne, PhD

Assistant Professors: Hasan Atiyeh, PhD; Michael Buser, PhD; Robert Scott Frazer, PhD, PE; Ajay Kumar, PhD

Adjunct Assistant Professors: Emilai Paloma Cuesta-Alonso, PhD; Sherry L. Hunt, PhD; John Wanjura, PhD

Associate Researcher: JD. Carlson, PhD

Post-Doctoral Fellow: Ronald Miller, PhD

Assistant Extension Specialist: Albert J. Sutherland, MS

Entomology and Plant Pathology

Phillip G. Mulder, Jr., PhD—Professor and Head

Director, National Institute for Microbial Forensics and Food & Agricultural Biosecurity (NIMFFAB): Kitty Cardwell, PhD

Associate Director, National Institute for Microbial Forensics and Food & Agricultural Biosecurity (NIMFFAB): Astri C. Wayandande, PhD

Regents Professors: Christopher L. Giles, PhD; Hao Bo Jiang, PhD

Regents Professor Emeritus: Jacqueline Fletcher, PhD

Endowed Professor Structural and Urban Entomology & Interim Pesticide Coordinator: Bradford M. Kard, PhD

Professors: John P. Damico, PhD; Kristopher L. Giles, PhD; Robert M. Hunger, PhD; Tom A. Royer, PhD; Jeanmarie Verchot PhD; Nathan Walker, PhD

Professors Emeriti: Robert W. Barker, PhD; Carol Bender, PhD; Richard C. Berberet, PhD; Jim T. Criswell, PhD; Kenneth Conway, PhD; Jack W. Dillworth, PhD; Jonathon Edelson, PhD; Alexander B. Filonow, PhD; Larry J. Littlefield, PhD; John R. Sauer, PhD; Russell E. Wright, PhD

Adjunct Professors: Charles Abramson, PhD; Norman C. Elliott, PhD; Hassan A. Molouk, PhD; Richard Nelson, PhD; Gary Puterka, PhD; Hal Reed, PhD

Assistant Professors: Carla Garzon, PhD; Li Maria Ma, PhD; Stephen Marek, PhD; Francisco Ochoa Corona, PhD; George Otip, PhD; Eric Rebek, PhD; Justin Tailey, PhD

Adjunct Associate Professors: J. Scott Armstrong, PhD; Kristen Baun, PhD; Carmen Greenwood, PhD; J.P. Michaud, PhD; Kiran Mysore, PhD; Camryn Young, PhD

Assistant Professors: W. Wyatt Hoback, PhD; Bruce Noden, PhD

Adjunct Assistant Professors: Rebecca Bennett, PhD; Steven Frank, PhD; Deborah Jaworski, PhD; Jacquelyn Lee, PhD; Brian McCormack, PhD; Michael Reiskind, PhD; Kay Scheets, PhD; Damon Smith, PhD

Assistant Researcher Professionals: Richard A. Grantham, PhD; Ali Zarrabi, PhD

Assistant Researcher: Trenna Blagden, PhD

Associate Extension Specialist: Andrine Shafrazi, PhD

Assistant Extension Specialist: Jen Olson, MS; Steven Kelly Seibs, MS

Director, Oklahoma Agricultural Leadership Program and Extension Coordinator: Edmond Bonjour, MS

Environmental Sciences

Brian J. Carter, PhD—Professor and Director

Professors: Karen Hickman, PhD (plant ecology); Chad Penn, PhD (soil environmental chemistry); Edwin L. Miller, PhD (forest hydrology); Gail W.T. Wilson, PhD (restoration ecology)

Associate Professors: Tracy Boyer, PhD (natural resource economics); Stephen W. Hallgren, PhD (forest ecology); Tyson E. Ochsner, PhD; Arthur Stoecker, PhD (natural resource economics)
Horticulture and Landscape Architecture
Janet C. Cole, PhD—Regents Professor and Head

Regents Professor: Michael W. Smith, PhD

Professors: Louis Anelá, PhD; Lynn Brandenberger, PhD; Brian A. Kahn, PhD; Niek Maness, PhD; William McGlynn, PhD; Dennis Martin, PhD; Michael A. Schnelle, PhD

Associate Professors: Bruce Dunn, PhD; Michael Holmes, MLA; Justin Moss, PhD

Assistant Professors: Qing Luo, MLA; Cheryl Mihalko, MLA; Bo Zhang, PhD

Assistant Extension Specialists: Casey Hentges, MS; David Hillocks, MS; Shelley Mitchell, PhD

Natural Resource Ecology and Management
Robert J. (Jim) Anley, Jr, PhD—Professor and Head

Regents Professor: D. M. Engle, PhD; Samuel D. Fuhlendorf, PhD

Professors: Craig A. Davis, PhD; Karen R. Hickman, PhD; Salim Hizirin, PhD; Thomas Kuzmic, PhD; Thomas B. Lynch, PhD; Rodney E. Will, Jr, PhD; Gall W. T. Wilson, PhD

Associate Professors: Kevin P. Allen, PhD; R. Dwayne Elmore, PhD; Stephen W. Hallgren, PhD; Timothy J. O’Connell, PhD; Daniel E. Shoup, PhD; Chris Zou, PhD

Assistant Professors: W. Sue Fairbanks, PhD; Laura E. Goodman, PhD; Omkar Joshi, PhD; Scott R. Lass, PhD

Adjunct Professor: David M. (Chip) Leslie, Jr, PhD

Adjunct Associate Professors: Shannon Brewer, PhD; James Long, PhD

Researchers: Mark S. Gregory, MS; John R. Weiz, MS

Assistant Extension Specialist: Marley Beem, PhD

Plant and Soil Sciences
Jeff Edwards PhD—Professor and Head

Regents Professors: Brett F. Carver, PhD; Donald S. Murray, PhD; William R. Raun, PhD; Hallin Zhang, PhD

Professors: Brian J. Carter, PhD; Shingping Deng, PhD; Jeffrey T. Edwards, PhD; Chad Penn, PhD; Yanqi Wu, PhD; Liuling Yan, PhD

Associate Professors: Michael Anderson, PhD; Brian Arnall, PhD; V. Gepel Kakanani, PhD; Tyson E. Oehler, PhD; Million Tadege, PhD; Jason G. Warren, PhD

Assistant Professors: Sergio M. Abi, Jr, PhD; Phil Alderman, PhD; Beatrice J. Haggard, PhD; Josh Lofton, PhD; Alex Rocatelli, PhD

College of Arts and Sciences
Art, Graphic Design and Art History
Rebecca Brincken, PhD—Wennerberg Chair of Art and Head

Professors: Sallie McCorkle, MFA; Chris Ramsay, MFA; Mark D. Siess, MFA; Jack Titus, MFA

Associate Professors: Jennifer Borland, PhD; Phil Choo, MFA; Cristina Cruz Gonzalez, PhD; Angela Piehl, MFA; Brandon Reese, MFA; Justen Renyer, MFA; Elizabeth Roth, PhD; Louise Siddons, PhD

Assistant Professors: Irene Backus, PhD; Pouya Jahanbakhsh, MFA; Andy Mattern, MFA; Shaoqian Zhang, PhD

Chemistry
Nicholas Materer, PhD—Chair of Art and Head

Regents Professors: K. Darrell Berlin, PhD; Frank D. Blum, PhD (Harrison I. Bartlett Chair); Warren T. Ford, PhD (emeritus); Lionel M. Raff, PhD; Ziad El Rassi, PhD

Professors: Allen W. Apblett, PhD; Richard A. Bunce, PhD; J. Paul Devlin, PhD (emeritus); John I. Gelder, PhD; Barry Lawine, PhD; Mark G. Rockley, PhD (emeritus); Sherly Tucker, PhD; Jeffrey White, PhD; Charles S. Weinert, PhD

Associate Professor: Smita Mohanty, PhD

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Assistant Professors: Austin Buchanan, PhD; Kalvani Nagaraj, PhD; Arash Pourrahib, PhD; Farzad Yousefian, PhD
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Clinical Instructor Executive Chef: Tiffany Poe, CEC MGT
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Clinical Assistant Professor and Director of Didactic Internship: Gena Wellenbarg, PhD, RD/LD
Director of Didactic Program in Dietetics and Assistant Director of Didactic Internship: Carol Beier, MS, RD/LD
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Other Faculty: Kyle Eastham, MS; Tom Westbrook, PhD

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Kayse M. Shrum, DO
Provost of the Center for Health Sciences and Senior Associate Dean of Academic Affairs of the College of Osteopathic Medicine
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Assistant Professor: Katherine Cook, DO

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Clinical Assistant Professor: Thomas Franklin, DO

Visiting Clinical Assistant Professor: Matthew Tucker, DO

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Research Associate Professor: Corey Babb, DO

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Dean Fullington, DO—Clinical Professor, Endowed Professorship and Chair

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Jeff Hackler, JD, MBA—Assistant Dean for Enrollment Management, Clinical Assistant Professor

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Michael Thomas, MD—Clinical Assistant Professor and Chair

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*Clinton J. Jones, DVM, PhD, Stillington endowed chair;
*Susan Little, DVM, PhD, DACVP, Parasitology and Knoll/Ewing Endowed Chair

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*Akhiela Ramachandran, BSc&AH, PhD, DACVM

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Grant B. Rezabek, DVM, MPH

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Assistant Research Professor: Saha Ayalew, PhD

Lecturer: Kelly Allen, MS, PhD

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Post-Doctoral Fellows: Anne Barrett, PhD; Cheta Neshmar, MS, PhD, Manjunath Siddappa, PhD; Jennifer Thomas, DVM

Graduate Teaching Associates: Nabin Poudeil, BVSc; Lasinam Sawant, BVSc, MSc

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Professors: *Joseph Alexander, DVM, DACVS (President, CIED) (emeritus); *Daniel Burba, DVM, DACVS; *Lionel J. Dawson, BVSc, MS, DACT; *Marg A. Gilmour, DVM, MS, DACVS; *Todd Holbrook, DVM, DACVM, DACSLM; *John P. Hoover, DVM, MS, DACVM, DACVP, and *Charles G. MacAllister, DVM, DACVM (emeritus); *Mark Neer, DVM, DACVM; *Richard Shawley, DVM, MS, DACVS (emeritus)

Associate Professors: *Robert J. Bahr, DVM, DACVP (emeritus); *Melanie Boileau, DVM, MS, DACVM; *Mary H. Bowles, DVM, DACVP (emeritus); *Lynzi Gilgiant, DVM, DACVP, DVM, DACSV; *Henry W. Jann, DVM, MS, DACSV, DACSLM (emeritus); *John Kirkpatrick, DVM, DACVP (emeritus); *Carolyn T. MacAllister, DVM, MS (emeritus); *Gregor L. Morgan, MSc, PhD, DACT (emeritus)

Clinical Associate Professor: *Marjorie Gross, DVM, MS, DACVA; *Roger Multis, DVM, MS, DACVA; *Douglas L. Nelson, DVM, MS, DACVA

Adjunct Associate Professors: *Weir J. Chen, PhD; Alex Cohen, M.D, PhD; *William Dubois, DVM, DACVP, Mark Munson, MD; *Cheryl Lopate, DVM, MS, DACT

Assistant Professors: *Elizabeth Coffman, DVM, MS, DACT, Theriogenology;
*Danielle Dugat, DVM, DACVS; *Andrew Hamolizek, DVM, MS, DACVIM; *Candace Lyman, DVM, DACT; *Shane Lyon, DVM, DACVIM; *Lauren Nafe, DVM, MS, DACVIM; *Michael J. Schoonover, DVM, MS, DACVS; *Corey Wall, DVM, MS, DACVR

Clinical Assistant Professors: *Ryan Baumwart, DVM, DACVIM, Cardiology; Kimberly D. Carter, DVM; *Paul DeMars, DVM, DABVP; *John Gilliam, DVM, DACVIM, DABVP; *Mackenzie Hallman, DVM, DACVR; *Robert Streeter, DVM, MS, DACVIM; *Lauren A. Sytniewski, DVM, DABVP; Joao Manuel Lemos Brandao, LMV, MS; Katrina Meinkeirth, DVM

Adjunct Assistant Professors: *Kay Backues, DVM, DACZM; *Jennifer D’Agostino, DVM, DACZM

Lecturer: Clay Hallman, DVM


Interns: Mikala Brown, DVM, SAS; Rose Cherry, DVM, DAMS; Chelsea Davis, DVM, SAIM; Lauren Evans, DVM, SAM; Emma Faulkner, DVM, SAM; Patrick Foth, DVM, EQM; Kelly Frye, DVM, SAM; Mallory Watson, DVM, SAM

*Board Certification in Specialty Area

Physiological Sciences

Martin Furr, PhD—Professor and Department Head

Regents Professors: Lin Liu, BS, PhD (Landberg-Kenlen Professor of Biomedical Research); Carey N. Pope, PhD (Stirling Chair in Toxicology)

Professors: James E. Breazile, DVM, PhD (emeritus); Nicholas L. Crox, PhD (emeritus); *Michael S. Davis, DVM, MS, PhD (Dixley Chair in Equine Sports Medicine); Jerry R. Malayer, PhD; *Dianne McFarlane, MS, DVM, PhD; Charlotte L. Ownby, MS, PhD (emeritus); Chris Ross, DVM, PhD; Alastair G. Watson, BVSc, PhD (emeritus)

Adjunct Professors: David W.A. Bourne, BPharm, MS, PhD; Stephen Brimijoin, BA, PhD; Larry P. Gonzalez, BS, MA, PhD; David Marlin, BSc, PhD; Terence H. Risby, PhD

Associate Professors: Jill Akkerman, DVM, PhD; Guangping Chen, MS, PhD; Myron Hinidale, DVM, PhD; Venouque Lacombe, DVM, PhD; Diplomate ACVIM; Diplomate ECEIM; James W. Lish, MS, PhD; *Pamela G. Lloyd, BA, PhD; *Lara K. Maxwell, DVM, PhD (emeritus); Larry E. Stein, PhD (emeritus)

Adjunct Associate Professors: Joseph R. Bidwell, BVSc, MSc, PhD; David R. Wallace, BS, PhD; Guolong Zhang, BS, MS, PhD

Assistant Professor: Ashish Ranjan, BVSc, PhD; Shihao Li, PhD

Adjunct Assistant Professor: Terry A. Gipson, BS, MS, PhD

Assistant Research Professors: Chaquun Huang, MD, PhD; Narasa Raju Tegiquaka, BSc, MSc, PhD

Research Associate Professor: Jing Liu, MD, PhD

Research Associate: M. Cristina Munteanu, MS, PhD

Post-Doctoral Fellows: Kaustuv Sahoo, PhD; Pulawendran Sivasami, MS, PhD; Xiaoyan Yang, PhD; Rohan R. Varshney, BTech, PhD; Erin Williams, PhD

Graduate Teaching Associates: Malavika Achanta, MS; Alia Houser, BS; Kalyani Ektate, BVSc; Girish Patil, MVS; Jennifer Rudd, DVM; Sri Nandhini Sethuraman, BVSc, MVS; Mohit Singh, MVS; Joshua VanOsdom, BS; Bo Zhai, MS

Graduate Research Associates: Gayan Bambunaraarachchi, BS; Willie Collins, BA; Allison Campolo, BS; Samuel Pushparaj, Robert Jeyasingh, BVSc; Kirstin Poindester, BS; Roshini Sathiaseelan, MVSc; Ramasamy Selvarani, MVS; Lakminderak

Staff: Dallas Karcher, BS; Christopher H. Pivinski, BS; Lana Schler, BS

Oklahoma Animal Disease Diagnostic Laboratory

Professor: *Bill J. Johnson, DVM (emeritus)

Assistant Professor: Akhilesh Ramachandran, BVSc&AH, PhD, DACVM

Clinical Associate Professor: Keith L. Bailey, DVM, PhD, DACVP

Clinical Assistant Professor: Grant Rezabek, DVM, MS

*Board Certification in Specialty Area
# Graduate College Academic Calendar

Refer also to the University Academic Calendar

<table>
<thead>
<tr>
<th>2016-2017 and 2017-2018**</th>
<th>Fall 2016</th>
<th>Spring 2017</th>
<th>Summer 2017</th>
<th>Fall 2017</th>
<th>Spring 2018</th>
<th>Summer 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class work begins</td>
<td>Aug. 15</td>
<td>Jan. 17</td>
<td>May 22</td>
<td>Aug. 21</td>
<td>Jan. 16</td>
<td>May 21</td>
</tr>
<tr>
<td>Admission to doctoral candidacy for summer graduation due in Graduate College</td>
<td>Feb. 3</td>
<td></td>
<td></td>
<td>Feb. 2</td>
<td></td>
<td></td>
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<tr>
<td>Admission to doctoral candidacy for fall graduation due in Graduate College</td>
<td></td>
<td></td>
<td>June 9</td>
<td></td>
<td>June 8</td>
<td></td>
</tr>
<tr>
<td>Last day to file a Graduation Clearance Form and a revised plan of study (if needed) to Graduate College</td>
<td>Oct. 28</td>
<td>Mar. 24</td>
<td>June 23</td>
<td>Oct. 27</td>
<td>Mar. 23</td>
<td>June 24</td>
</tr>
<tr>
<td>Last day to file a diploma application with the Registrar’s Office</td>
<td>Nov. 1</td>
<td>April 3</td>
<td>July 3</td>
<td>Nov. 1</td>
<td>April 2</td>
<td>July 2</td>
</tr>
<tr>
<td>Admission to doctoral candidacy for spring graduation due in Graduate College</td>
<td>Nov. 11</td>
<td></td>
<td></td>
<td>Nov. 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Priority deadline to submit results of thesis/dissertation oral defense forms to Graduate College</td>
<td>Nov. 18</td>
<td>April 15</td>
<td>July 14</td>
<td>Nov. 22</td>
<td>April 20</td>
<td>July 13</td>
</tr>
<tr>
<td>Last day to submit results of thesis/dissertation oral defense forms to Graduate College to meet semester graduation deadlines</td>
<td>Nov. 28</td>
<td>April 21</td>
<td>July 21</td>
<td>Dec. 1</td>
<td>April 27</td>
<td>July 20</td>
</tr>
<tr>
<td>Priority deadline for online submission of electronic dissertation or thesis, signature approval page</td>
<td>Nov. 23</td>
<td>April 21</td>
<td>July 21</td>
<td>Dec. 1</td>
<td>April 27</td>
<td>July 20</td>
</tr>
<tr>
<td>Online submission of electronic dissertation or thesis, signature approval page due for degree candidates</td>
<td>Dec. 2</td>
<td>April 28</td>
<td>July 28</td>
<td>Dec. 8</td>
<td>May 4</td>
<td>July 7</td>
</tr>
<tr>
<td>Term ends</td>
<td>Dec. 9</td>
<td>May 12</td>
<td>Aug. 4</td>
<td>Dec. 15</td>
<td>May 11</td>
<td>Aug. 3</td>
</tr>
<tr>
<td>Graduate Commencement</td>
<td>Dec. 9</td>
<td>May 12</td>
<td></td>
<td>Dec. 15</td>
<td></td>
<td>May 11</td>
</tr>
</tbody>
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**tentative
Graduate College

College Administration
Sheryl Tucker, PhD—Associate Provost and Dean
Jean Van Delder, Ph.D.—Senior Associate Dean
Ken Clinkenbeard, PhD, DVM—Associate Dean

Campus Address and Phone:
202 Whitewater, Stillwater, OK 74078
405.744.6368 (Admissions); 405.744.6366; Fax: 405.744.0355
Website: gradcollege.okstate.edu  E-mail: grad@okstate.edu

Graduate education at Oklahoma State University (OSU) is organized around the scholarly pursuit of new knowledge, both through didactic instruction and through independent and group research conducted utilizing the facilities and resources of a major research university. OSU’s national and international reputation as the primary research grant-giving institution is achieved by faculty and students under the auspices of OSU’s graduate programs.

The first graduate degree was conferred by OSU in 1912, and the Graduate School was organized in 1929. OSU offers more than 200 graduate degree programs, including several interdisciplinary and joint-degree programs.

1.0 Overview

1.1 Graduate Students. Over 4,500 graduate students currently study at OSU. Part of OSU’s mission as a Land Grant University is to serve the people of the region, the state, the nation, and the world by making a first-class education available to all. In response to the growing diversity and demographic changes in the state and in the nation, OSU is committed to preparing graduates to live and work in a culturally pluralistic world. The Graduate College is proud of the diversity of its graduate student population and of their contributions to both the generation and dissemination of new knowledge through their involvement in the university’s research and instructional programs. Numerous multicultural student organizations on campus provide information and support to international and diverse students to assist in the successful completion of their graduate studies.

1.2 The Graduate College. The Graduate College supervises all graduate work offered by the university. Professional degrees are offered through the Center for Veterinary Health Sciences and the Center for Health Sciences in Tulsa. The Graduate College sets standards for admission to graduate standing and recommends to the Board of Regents for degrees those students who have completed course work required for graduation. In addition, the Graduate College offers a number of student services and professional preparation opportunities specifically designed for graduate student success while at OSU as well as after graduation. These activities include graduate teaching assistant orientation programs, three-month oral communication competitions and thesis/dissertation writing workshops.

1.3 Graduate College Memberships. The Graduate College is a member of the Council of Graduate Schools (CGS), the Conference of Southern Graduate Schools (CSGS), and the Midwestern Association of Graduate Schools (MAGS).

1.4 Organization of the Graduate College. Consistent with its objective of maintaining the highest standards in graduate education, the Graduate College administers the policies and procedures specified and established by the Graduate Faculty, Board of Regents for the Oklahoma Agricultural and Mechanical Colleges and the Oklahoma State Regents for Higher Education. The dean of the Graduate College is the senior administrator of the College as well as the executive committee of the Graduate Faculty; it is elected by the Graduate Faculty to work with the dean of the Graduate College in the development and administration of applicable policy. The Graduate Council formulates and reviews policies concerning the conduct of graduate study at OSU, and it participates in the periodic review of graduate programs. All proposed policies and requests related to the initiation and development of graduate curricular offerings and programs are referred to the Graduate Council for review, comment, and approval.

1.5 Accreditation. OSU is accredited by the Higher Learning Commission, (HLC) of the North Central Association of Colleges and Schools. (HLC, 30 N. LaSalle Street, Suite 2400, Chicago, IL 60602-2504; phone 1.800.621.7440; www.hlcommission.org). Several programs within the disciplinary colleges are also accredited by other agencies; see “Accreditation” in “The University” section of the Catalog.

1.6 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 any time by the dean of the Graduate College in consultation with the Graduate Council. See the front sections of the Catalog such as “University Academic Regulations” and “Student Services” for additional policies and information relevant to graduate students.

1.7 Responsibilities. All graduate students are expected to read and to comply with the written regulations of their graduate programs and disciplinary college as well as the Graduate College and University. The regulations presented in the Catalog may be supplemented by written departmental or program requirements available at departmental offices and/or website. Admission to a specific graduate program obligates the student to understand and adhere to the policies of that program.

General regulations in the following sections relate to requirements for admission, enrollment, and academic standing. Subsequent sections outline requirements for the following credentials: Graduate Certificate, Master’s, Specialist in Education, Doctor of Education, and Doctor of Philosophy degrees. Particular attention should be given to timing and substantive requirements for matriculation, especially admission, the Plan of Study, residency, language proficiency, research, dissertation/thesis/creative component report, and graduation. The regulations are prescribed by the Graduate Council with the intent of assuring high-quality graduate programs and effective interaction of Graduate Faculty members and graduate students.

1.8 Email as Official Correspondence. OSU uses the institutional O-Key email address as an official means of communication from OSU faculty, staff, and administrators to students. All students have an official OSU email address that is activated when they set up their O-Key account. Students are expected to activate and check their OSU email on a frequent and consistent basis to remain informed of their official university business and are expected to ensure that adequate email space is available to receive messages.

1.9 Tuition and Fees. Refer to the Tuition, Fees and Cost Estimates’ section in the Catalog.

1.10 Exception Request. Any request for a waiver of, exception to, or deviation from, any requirement set forth in the “Graduate College” section of the Catalog must be in the form of a written petition to the dean of the Graduate College. Such petitions should include a supporting letter from the faculty adviser or program coordinator.

2.0. Services for Graduate Students

For a complete list of university services, please visit the “Current Student Resources” link on the Graduate College website (http://gradcollege.okstate.edu) or the “Student Life” link on the OSU website (http://go.okstate.edu).

2.1 Graduate and Professional Student Government Association. The Graduate and Professional Student Government Association (GPSGA) is an official advisory body to the University President and dean of the Graduate College and serves as the representative voice for graduate and professional students at OSU. Its mission is to improve all aspects of post-graduate education and student life at OSU.

The Association provides for representation from each graduate and professional degree program. Representatives are nominated by the graduate programs with membership conferred by the GPSGA president. Each representative is appointed for a period of one academic year. Each representative must be in good academic standing and enrolled in at least two graduate credit hours.

The GPSGA provides funds for graduate and professional student organizations and travel grants to help students defray costs incurred by attending and presenting at professional meetings. For more information consult http://gpsga.okstate.edu.

3.0 Funding Your Graduate Education

3.1 Financial Aid. One of the most common sources of funding for graduate students is graduate assistantships. Graduate teaching and research assistantships support OSU’s instructional and scholarly activities. Most academic programs routinely evaluate graduate admission applications not only for admission consideration but also for the possibility of assistantship offers. The graduate program will contact newly admitted students to inform them if a funding offer is available. These awards assist students in paying for their graduate education and also offer opportunities to gain valuable skills and experience in their discipline and as a professional.

3.2 Federal Financial Aid. All domestic students who want to qualify for federal financial aid should complete the Free Application for Federal Student Aid (FAFSA). Students are encouraged to complete the FAFSA annually as soon after January 1 as possible to receive aid for the subsequent academic year. The FAFSA is available at https://fafsa.ed.gov.

3.3 OSU Short-Term Emergency Loans. In addition to potential federal loans that may be awarded based on the Free Application for Federal Student...
Aid (FAFSA), OSU assists students in need of immediate funds through the Short-Term Emergency Loan Program. This program is designed to help OSU students who are currently enrolled and attending classes to meet educationally-related off-campus unexpected expenses. The program is not designed to pay a debt owed to OSU. Qualified students may borrow up to $300 less a $15 service charge for each semester. Additional information on the Short-Term Emergency Loan Program can be found at financialaid.okstate.edu/component/content/article/52-types-of-aid/110stl.

3.4 Graduate Assistants. OSU recognizes two types of graduate assistants for students enrolled in master’s, specialist and doctoral programs. Students must meet certificate and non-degree seeking students are not eligible for GTA or GRA positions or associated benefits.

1. A Graduate Teaching Assistant (GTA) must be admitted to and meet the requirements of the Graduate College, be fully admitted to a graduate degree program, enrolled, and be under the supervision of an appropriate graduate faculty member. In consultation with the supervisor, the GTA works to gain instructional skills and an increased understanding of the discipline. The GTA is provided a stipend and their primary responsibilities are to support the University’s instructional mission. Services provided by a GTA may include: classroom or laboratory teaching; advising and mentoring of students; proctoring examinations; grading papers, homework, and/or projects; accompanying/coaching musical or vocal performances, providing artistic instruction or assisting with preparation and management of materials and programs that are utilized in imparting knowledge or in the instructional process, or providing other general assistance in the instruction process. A GTA may be assigned primary responsibilities in an extension, outreach, or service role for which those responsibilities support the instructional mission of the University. GTA may not be given duties to support faculty research or those primarily clerical in nature.

2. A Graduate Research Assistant (GRA) must be admitted to and meet the requirements of the Graduate College, be fully admitted to a graduate degree program, enrolled, and be under the supervision of an appropriate graduate faculty member. A GRA is provided a stipend and their primary responsibilities are to provide general support to the University’s research mission. These responsibilities may or may not relate directly to the student’s thesis or dissertation. Duties of the GRA primarily involve applying and managing research concepts, practices, or methods of scholarship. Services provided by a GRA may include: assisting faculty members in a research or creative activity; performing degree-related professional or administrative services that supports research, instruction, professional development, or outreach missions of the University; developing and evaluating instructional materials or curricula; or assuming responsibility for designated scholarly endeavors.

“Perform degree-related professional or administrative services” does not include jobs that are outside the student’s field of study. Assistantship inquiries should be addressed to the head unit or graduate program coordinator for the unit/department/school/program in which the position is desired. The service expected is governed by the terms of the appointment.

3.5 Graduate Assistantship Responsibilities. An offer of an assistantship is a commitment by a unit/department/school/program to provide financial support to admitted graduate students. Assistantships are an investment made by a unit/department/school/program and are granted primarily to enable the student to pursue an advanced degree and complete a successful experience. Accepting an assistantship brings with it a professional obligation to fulfill all of the responsibilities associated with the assistantship assignment. Included in this professional obligation is the expectation that students who have accepted an assistantship will diligently pursue their degree to completion. In recognition of this commitment and to provide adequate time for students holding assistantships to devote to study, employment as a graduate assistant is limited to a total, from all University sources (including external grants and contracts),

1. 0.50 FTE (an average of 20 hours per week) in the Fall and Spring semesters, and 0.75 FTE (an average of 30 hours per week) between the end of the Spring semester and the beginning of the Fall semester. Exceptions to this limitation may be requested by the employing unit or graduate program to the dean of the Graduate College.

A student with a 0.50 FTE assistantship is expected to devote, on average, 20 hours per week to their duties as a graduate teaching or research assistant; the remainder of academic effort is devoted to his/her own studies and research. The time devoted to the assistantship may vary from day to day and week to week as long as it does not exceed the average given above.

As part of a graduate student’s educational experience, OSU makes a number of GRAs available on a routine basis. Graduate students on a GTA or GRA are expected to devote full-time effort to their graduate programs. While the GRA appointment provides an assistantship stipend for an average of 20 or 0.50 FTE assignment, respectively, in recognition of contributions to the OSU research enterprise, it does not indicate that no additional time and effort may be required of the graduate student who is actively pursuing a graduate research degree. As part of the research project, the graduate student’s advancement in the program, the student may be enrolled in credit hours for academic credit or only enrolled in formal coursework. Irrespective of that enrollment, it is expected that the graduate student is working full-time toward completion of the advanced degree. OSU, like most institutions nationwide, does not define the research credit hour as equating to a specific amount of time and effort, as the nature of research is highly dependent on the individual’s progress on the project. For instance, general OSU policy only requires a minimum enrollment in two credit hours when a graduate student is working on a research project and using OSU resources unless they are enrolled as a GTA/GRA.

In addition, all students holding a graduate assistantship are required to be full-time students—see “Enrollment Requirements” below. For Fall and Spring semesters, students employed 0.50 FTE must be enrolled in at least six credit hours to be considered full-time, while students employed less than 0.50 FTE must be enrolled in at least nine credit hours to be considered full-time. However, full-time enrollment for students admitted to doctoral candidacy is two credit hours. For the summer term, students employed at any level must be enrolled in at least two credit hours during any summer session to be considered full-time.

International students who are dependent upon an assistantship for their financial guarantee must remember that forfeiture of that assistantship may require the re-submission of a newly revised financial guarantee to the Office of International Students and Scholars. Students who forfeit their graduate assistantships risk recision of tuition waivers, as well as any health insurance coverage for graduate assistants provided by the University.

Note that all graduate student benefit programs, such as tuition waivers, are only available to individuals with a primary classification as a graduate student enrolled in a degree program, which does not include certificate-seeking or non-degree seeking graduate students. OSU employees taking graduate classes are eligible for benefit programs, but their employment is a benefit eligible position. One cannot selectively opt-out of certain benefits to seek eligibility for other benefits. Please contact the Graduate College or Human Resources if you have questions.

3.6 Graduate Assistant General Benefits. GTAs and GRAs employed at least 0.50 FTE in the fall/spring semester (average of 20 hours per week) are eligible for a non-governmental organization guaranteeing payment of all health care expenses including a service charge one time per semester. Additional information on the Short-Term Emergency Loan Program can be found at financialaid.okstate.edu.

3.7 Health Insurance for International Students. The Oklahoma State University College website (gradcollege.okstate.edu) contains additional information on the Short-Term Emergency Loan Program. This program is designed to help OSU students in need of immediate funds through the Short-Term Emergency Loan Program. This program is designed to help OSU students who are currently enrolled and attending classes to meet educationally-related off-campus unexpected expenses. The program is not designed to pay a debt owed to OSU. Qualified students may borrow up to $300 less a $15 service charge for each semester. Additional information on the Short-Term Emergency Loan Program can be found at financialaid.okstate.edu/component/content/article/52-types-of-aid/110stl.
The insurance premium will also be waived for students who provide documented evidence of health insurance coverage by an employer. Nonimmigrant students employed by OSU and eligible for both employer-provided insurance and international student health insurance may select between the two, as long as the insurance selected includes evacuation and repatriation in coverage as a prerequisite.

Students covered by a private medical insurance plan with benefits comparable to or better than the OSU plan, may request a waiver from OSU’s international student health insurance requirement. Coverage must be in effect from the first day of any first term courses for a 12-month period.

To use alternate insurance, students must complete and submit a waiver request no later than the fifth day of classes. Waiver forms can be found on the International Students and Scholars (ISS) website at http://iss.okstate.edu.

If a student holds an appointment as at least a 0.25 FTE OSU GTA or GRA position, OSU provides the student health insurance policy.

3.8 McNair Graduate Fellowships for former McNair Scholars. Entering graduate students who are graduates of a McNair Scholar Program as an undergraduate may be eligible to become McNair Graduate Fellows. McNair Graduate Fellows receive a tuition waiver for all degree-eligible courses up to the number of hours in their degree program, irrespective of a qualifying assistantship. Such tuition waivers cannot apply to independent study, leveling, or outreach-type courses. The McNair Graduate Fellow Tuition Waiver Program is competitive and is not guaranteed, irrespective of the application fee waived. Please contact the Graduate College (gradi@okstate.edu) for more information as restrictions apply. Also, note that all graduate student benefit programs, such as the McNair Graduate Fellow Tuition Waiver Program, are only available to individuals with a primary classification of graduate student. OSU employees taking graduate classes do not qualify for graduate student benefit programs, irrespective of whether their employment is a benefit eligible position. One cannot opt-out of certain benefits in an a-la-carte manner to seek eligibility for other benefits. Please contact the Graduate College or Human Resources if you have any additional questions. McNair Graduate Fellows are required to submit the necessary contract to the Graduate College each year and restrictions apply.

3.8.1 OSU Graduate College, City Year National Service Scholars. Oklahoma State University is proud to partner with City Year through our shared visions and values of integrating the power of knowledge and service in addressing social problems. The OSU Graduate College City Year National Service Scholars Program provides City Year Alumni an application fee waiver and a tuition waiver for all degree-eligible courses up to the number of hours in their degree program, however, acceptance as an OSU Graduate College City Year National Service Scholar is competitive and is not guaranteed. The application requirements are: 1) Must be completing your year of service or be a senior AmeriCorps member, alumni, or staff; 2) Must provide a letter of program completion from your Director of City Year Alumni and Career Services; 3) Only applies to residential graduate programs on Stillwater, Tulsa, or Center for Health Sciences campuses – no distance learning or outreach formats; 4) Graduate certificate programs are not eligible for this or other tuition benefit programs; 5) Cannot be used to earn a second graduate degree; 6) Cannot accept a tuition waiver for another tuition waiver program, including service programs; 7) Must participate in OSU City Year National Service Scholars Program activities; 8) OSU City Year National Service Scholars fellowship and subsequent tuition waiver is applicable to one OSU graduate degree; 9) Renewal of the OSU City Year National Service Scholars fellowship is contingent upon satisfactory progress each term; 10) See the OSU City Year National Service Scholars Fellowship Tuition Waiver Agreement for additional provisions.

3.9 Spouse Tuition Waivers. A spouse of a graduate teaching or research assistant is receiving a tuition waiver that is associated with an eligible assistantship is eligible to apply for a waiver of the non-resident portion of tuition for all graduate level eligible courses taken. Tuition waivers cannot apply to independent study, leveling or outreach-type courses. Contact the Graduate College for details.

3.10 Student Employment. Career Services provides assistance to OSU students seeking part-time employment or work study programs. Students are informed of job opportunities on campus and in the Stillwater community. Application materials are available from 360 Student Career Services located in the Student Union, 12 to 20 hours of work per week in clerical, technical, food service or general labor positions. Rate of pay and work schedules vary.

Individual job search assistance is available with the graduate career consultant in the Student Union Career Services Office or with any of the college career consultants located in the respective disciplinary colleges. Services include resume and curriculum vitae development, written correspondence assistance, mock interviews and interview preparation, academic and non-academic job search assistance, workshops and career fairs. More information may be found online at HireOSUGrads.com.

4.0 ADMISSION TO THE GRADUATE COLLEGE

Holders of baccalaureate or first professional degrees from colleges and universities of recognized standing (including U.S. institutions accredited by agencies recognized by the U.S. Department of Education) are eligible to seek admission to the Graduate College. In some cases, the Graduate College, in consultation with the graduate program, may require certain prerequisite courses to bring the applicant’s credentials from international institutions to the equivalent of a U.S. bachelor’s degree. These “bridge” courses must be completed within a designated period of time and/or prior to enrollment beyond a prescribed number of hours of graduate course work. Applicants must complete the web-based application and submit official transcripts of all academic work and one received in consultation with the graduate program, may require certain prerequisite courses for admission. No application for admission will be reviewed until the application fee is paid.

The prospective student should obtain transcripts for bachelor’s degree(s) conferred or pending as well as for any graduate or professional course work and upload these transcripts as part of their application (some programs may require applicants to upload transcripts from all institutions previously attended).

If an applicant is offered admission to graduate studies, then the applicant will be notified to have the institution that their bachelor’s degree from the OSU’s Graduate College, 202 Whitehurst, Stillwater, OK 74078.

To be accepted, the transcripts must be issued from the school and must show the complete student record, the official seal of the institution, be signed by the issuing office, and be in a sealed envelope or electronically delivered directly from the issuing institution.

To assure adequate time, completed applications and transcripts should be received at least 30 days prior to the graduate program application deadline or the beginning of the semester, whichever comes first. All transcripts become the property of OSU and are not released or returned.

When the applicant’s file is complete, the faculty in the graduate program of the student’s area of interest reviews the material and recommends an admission status to the dean of the Graduate College. The final decision on the Graduate College is determined by the dean on the basis of the graduate program’s recommendations, prior academic performance of the applicant, and availability of space, facilities, and faculty mentors in the program.

4.1 OSU 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 evaluate a degree candidate for graduation.

4.2 Types of Admission. Admission to a graduate program at OSU is based on an evaluation of an applicant’s overall record, experience, personal qualifications, proposed area of study, and fit with the graduate program. The Graduate College does not set minimum GPA requirements and allows graduate programs to evaluate applicants and make admission decisions.

4.2.1 Admission Without Qualification. Students planning to work toward a graduate degree in a recognized graduate program may be admitted in good standing provided they meet all OSU graduation requirements.

4.2.2 Provisional Admission. A student can be admitted provisionally upon recommendation of the graduate program and with concurrence by the dean of the Graduate College. Admission with provisional status is granted to an applicant who does not meet all the requirements of the graduate program. The student will be assigned an academic standing provided they meet all Graduate College and graduate program requirements.

4.2.3 Probation Admission. A student can be admitted with probation status upon recommendation of the graduate program with concurrence by the dean of the Graduate College. Admission with probation status is granted to an applicant who has deficiencies in previous academic course work. A student admitted on probation status must at least a 3.00 GPA through the semester in which s/he completes nine hours of courses eligible for graduate credit. Upon successful completion of those requirements the student will be granted good academic standing. Failure to meet the required level of academic performance while in a probationary status may result in dismissal from the Graduate College.

4.2.4 Conditional Admission. Several graduate programs at OSU will consider an applicant for conditional admission. An applicant may be conditionally admitted under the following conditions.

4.2.4.1 Admission Without Qualification. Students planning to work toward a graduate degree in a recognized graduate program may be admitted in good standing provided they meet all Graduate College and graduate program requirements.

4.2.4.2 Provisional Admission. A student can be admitted provisionally upon recommendation of the graduate program and with concurrence by the dean of the Graduate College. Admission with provisional status is granted to an applicant who does not meet all the requirements of the graduate program. The student will be assigned an academic standing provided they meet all Graduate College and graduate program requirements.

4.2.4.3 Probation Admission. A student can be admitted with probation status upon recommendation of the graduate program with concurrence by the dean of the Graduate College. Admission with probation status is granted to an applicant who has deficiencies in previous academic course work. A student admitted on probation status must at least a 3.00 GPA through the semester in which s/he completes nine hours of courses eligible for graduate credit. Upon successful completion of those requirements the student will be granted good academic standing. Failure to meet the required level of academic performance while in a probationary status may result in dismissal from the Graduate College.

4.2.4.4 Conditional Admission. Several graduate programs at OSU will consider an applicant for conditional admission. An applicant may be conditionally admitted under the following conditions.

4.3 Non-Degree Seeking Student Status. An applicant may be admitted to the Graduate College as a non-degree seeking student if he or she does not have
immediate plans to become a degree candidate, but wants to take graduate courses, prerequisites, or other courses. Admission to the Graduate College as a non-degree seeking student means only that the student will be permitted to enroll in courses through the Graduate College. It does not imply that the student has been admitted to a program or accepted to an advanced degree or that the student will be able to obtain a graduate degree from OSU. Non-degree seeking students are not eligible for GTA or GRA positions or associated tuition waiver benefits.

4.3.1 Non-Degree Seeking Student Status Requirements. Non-degree seeking students are subject to the same admission standards as degree-seeking students, including English language proficiency. Applicants for advanced degree programs must satisfy the necessary conditions for admission to the Graduate College. Non-degree seeking students must either present evidence of undue hardship or other factors that warrant admission, and/or proof of English competency can be in the form of an official TOEFL or IELTS, or TOEFL iBT scores, or additional testing may be still necessary if evidence of English proficiency through the submission of test scores, such as the Internet Proficiency (TELP) upon arrival at OSU and comply with the provisions associated with that test.

Applications who present a TOEFL score of at least 79 iBT/550 PBT or an IELTS academic stream score of at least 6.5 satisfy the Graduate College’s English proficiency requirements for admission to a graduate program. Note that some graduate programs require a TOEFL score above these levels, and applicants should contact the Graduate College for specific TOEFL or IELTS requirements.

Applicants who present a TOEFL score of at least 61 iBT/500 PBT, but less than 79 iBT/550 PBT (or an IELTS academic stream score of 6.0) and who demonstrate unusual academic promise may be admitted to graduate study on conditional status upon petition to the Graduate College by the graduate program in question. Applicants with a TOEFL score of at least 61 iBT/500 PBT, but less than 79 iBT/550 PBT (or an IELTS academic stream score of 6.0), must successfully complete a minimum of 12 weeks of study at an intensive English program (IEP) approved by the Oklahoma State Regents for Higher Education State Regents. At least two-thirds (eight weeks) of the 12 weeks must be instruction at an advanced level. A list of State Regents’ approved IEPs can be found in the OSRHE Academic Affairs Procedures Handbook. The OSU intensive English program, known as the English Language Institute (ELI), is a state-approved IEP. More information on the OSU ELI program can be found here http://ieo. okstate.edu/ieo.

Applicants, who do not submit a TOEFL/IELTS score, can seek admission to the OSU English Language Institute (ELI) in their first semester. These students will be issued an I-20 by ELI. After achieving the required score (500) and immediately prior to admission, the applicant must successfully complete a minimum of 12 weeks of study at an intensive English program (IEP) approved by the State Regents as described above. Upon successful completion of the ELI program students will be issued an I-20 by the Office of International Students and Scholars and be administratively admitted to their graduate degree program. Such students will be required to take the institutional TELP (see below) at the first opportunity thereafter and to comply with its provisions. Students must continue to enroll in ELI until their successful completion. Concurrent enrollment in graduate permits and ELI is not permitted.

Students who submit TOEFL scores from the IBT for reading, listening and writing shall also be evaluated to determine if additional course work is needed. Students who submit TOEFL scores and who score at least 42 on the combined reading and listening portions, with a score of at least 20 in each section, are not required to enroll in any English language proficiency courses. Students who score less than this on the reading and listening portions of the IBT (irrespective of score on the written portion) are required to enroll in ENGL 0003 during their first semester. ENGL 0003 carries a grade of S/U and may not be used toward minimum degree requirements. Students must enroll in ENGL 0003 each semester until a grade of S is earned. Students who complete ENGL 0003 and who have a score less than 22 on the writing portion of the IBT are also encouraged to enroll in ENGL 4893*.

Students who score at or above the minimum score(s) on the reading and listening portion of the TOEFL, but less than 22 on the writing portion, are required to enroll in ENGL 4893* at some point in their studies. ENGL 4893* carries graduate credit and may be used toward minimum degree requirements; a grade of “B” or better in this course is required.

In situations when the student is required to take ENGL 0003 or ENGL 4893*, the appropriate course must be listed on the student’s Plan of Study and becomes part of degree completion requirements.

4.4.2 Test of English Language Proficiency. Students for whom English is not their native language and who score less than 500 on the TOEFL, or who take the TOEFL or IELTS, must take the Test of English Language Proficiency (TELP) upon arrival at OSU and comply with the provisions associated with that test. The TELP is administered on the Stillwater and Tulsa campuses before each regular semester through University Testing and Assessment. A waiver of the TELP requirement will be granted to a student who has:

1. achieved a score of 600 PBT or higher and a score of 5.0 or higher on the Test of Written English (TWE) or Essay; or

2. achieved an IELTS, (academic stream), overall band score of 6.5 or higher and a band score of 6.0 or higher on each of the band scores for Listening, Reading and Writing.

A score of 70 on both portions of the TELP is considered passing. Students who score less than 70 on the Listening/Diction portion of the TELP (irrespective of the score on the writing portion) are required to enroll in ENGL 0003 during their first semester. ENGL 0003 carries a grade of S/U and may not be used toward minimum degree requirements. Students must enroll in ENGL 0003 each semester until a grade of S is earned.

Students who score at least 70 on the Listening/Diction portion of the TELP, but less than 70 on the Writing portion are required to enroll in ENGL 4893* at some point in their studies. ENGL 4893* carries graduate credit and may be used toward minimum degree requirements; a grade of “B” or better in this course is required. In situations when the student is required to take ENGL 0003 or ENGL 4893*, the appropriate course must be listed on the student’s Plan of Study and becomes part of degree completion requirements.

4.4.3 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, including laboratory assignments. Graduate students who serve only as laboratory assistants (e.g., setting up and/or maintaining equipment) are not required to comply with these provisions. See http://gradcollege.okstate.edu/ita for specific policy requirements for the International Teaching Assistant Program. A new international teaching assistant (ITA) is required to have a qualifying score of 26 or greater on the speaking portion of the iBT or to take the ITA test prior to being approved for instructional assignments. All new ITAs are also required to participate in the international teaching assistant orientation. See http://gradcollege.okstate.edu/ita for specific policy requirements.

5.0 TRANSFER OF GRADUATE CREDITS

Transfer credit must be recommended by the graduate student's advisory committee through the submission of a Plan of Study that is approved by the dean of the Graduate College. Transfer credit will only be considered if it was earned when the student was post-baccalaureate (i.e., after earning a bachelor's degree) at an accredited institution and the grading system for the course in which the incomplete was received is the only graduation requirement. Students must enroll in research, thesis, or dissertation hours, as a course in which the incomplete was received is the only graduation requirement. (Students with a master's degree seek admission to a thesis or dissertation, irrespective of the number of credit hours of such courses either required or permitted for the degree.

6.0. ENROLLMENT POLICIES

6.1. Initial and Continuous Enrollment Policy. A prospective student must enroll for courses at OSU within the time specified in his or her admission letter to retain active status. A prospective student who does not conform to these conditions must reapply for admission.

Any student who interrupts enrollment for one year (i.e., a consecutive period of one fall semester and one spring semester) must reapply for admission, and will be subject to the regulations in effect at the time of reapplication. See section 6.6 below for additional doctoral candidacy enrollment requirements.

6.2. Full-Time Enrollment. To be considered enrolled full time, a graduate student must be enrolled in at least nine hours in either fall or spring semester and at least four hours in each summer session. Full-time enrollment for Graduate Teaching/Research Associate/Assistants (GTAs/GRAs) with a 0.50 FTE appointment is at least six hours in either fall or spring semester and at least two hours during a summer session.

6.3. Minimum and Maximum Enrollment. Students are required to be enrolled in at least two credit hours in each semester in which they are using physical or faculty resources of the University. (Students holding graduate assistantships should verify these conditions at their department or school below.) Regardless of the number of hours taken, a student may not enroll in more than 12 (for the Spears School of Business graduate programs) credit hours in the fall or spring semester without permission of the dean of the Graduate College. During the summer session, a student may not enroll in more than nine credit hours taken in any session during the eight-week summer session. No more than three credit hours can be taken during the first summer session (intersession). Summer intersession is defined as any course that begins after the end of the spring semester and ends before the beginning of the eight-week summer session. For any short course session less than eight weeks in length, enrollment shall not exceed one credit hour for each week.

International students on F-1 or J-1 visas must maintain full-time status (as defined above) during the first semester of enrollment, and during each fall and spring semester thereafter.

6.4. Graduating Semester Enrollment. Each degree-seeking graduate student must be enrolled in at least two hours of courses eligible for graduate credit during their graduating semester (defined as the semester in which they satisfactorily complete all degree requirements). However, a student would not need to be enrolled during their graduating semester if they meet the following conditions: 1) has been assigned an “Incomplete” (grade of I) in a non-research or creative component course; 2) the course is required for graduation; and, 3) the course in which the incomplete was received is the only graduation requirement left to fulfill. Students must enroll in research, thesis, or dissertation hours, as appropriate, during each semester in which they are involved in research leading to a thesis or dissertation, irrespective of the number of credit hours of such courses either required or permitted for the degree.

6.5 Master’s Degree Enrollment Requirements. Students with a fall (spring/summer) graduating semester who have research courses (i.e., courses numbered 5000) on their approved Plan of Study must satisfactorily complete no fewer than six hours of courses eligible for graduate credit during the calendar year (academic) which includes the graduating semester. As an example, a student with a fall semester graduation date must be enrolled for at least six hours for that fall semester plus the preceding spring semester and summer session. Doctoral students meet this requirement by virtue of the Doctoral Candidacy Enrollment Requirements noted below.

6.6 Doctoral Candidacy Enrollment Requirements.

Doctoral students who have completed the requirements for admission to doctoral candidacy and had the Board of Graduate Studies award Doctoral Candidacy Form approved by the Graduate College may enroll for a minimum of at least two credit hours during any term and be considered full-time. This post-candidacy enrollment option applies to all qualified graduate students, including GTAs, GRAs, international students and veterans receiving VA benefits. A student is normally expected to enroll primarily in research hours or in program-approved courses after being admitted to doctoral candidacy.

Continuous enrollment post-candidacy is required of all students. Enrollment of a minimum of at least two credits per semester is required for every semester of a student’s candidacy (summer session excluded) until graduation. It is ultimately the responsibility of each student to ensure that they meet this enrollment requirement. Students who are not able to maintain active status are strongly encouraged to consult with their program, advisor and the Graduate College to determine whether requesting a Leave of Absence (LOA) is the most appropriate course of action.

6.6.1 Reinstatement Fee. Post-candidacy students who do not maintain continuous enrollment will be assessed a reinstatement fee based upon their residency status at the time of last enrollment as follows:

- Resident: $750/semester (summer session excluded) of non-enrollment
- Nonresident: $1,900/semester (summer session excluded) of non-enrollment

In addition to the reinstatement fee, students whose continuous enrollment disruption exceeds one academic year also must apply for readmission to the graduate program (see Enrollment).

During the readmission process, previous coursework will be evaluated for applicability in accordance with coursework (10 years) and time-to-degree (5 years) time limits (see Time to Degree Requirements).

Notification of the conditions of reinstatement and readmission will be provided if an acceptance occurs. New program requirements may apply based on the aforementioned enrollment policy. Please note that reinstatement and readmission are not guaranteed and significant challenges may occur that hinder a student’s ability to complete a degree after a lapse in enrollment, such as the reapplication process (e.g., new letters of recommendation and unexpired standardized test scores); availability of the same graduate advisor, project and/or mentor support; and new/revised program requirements and/or core courses for degree.


For the purpose of receiving monetary assistance through the Office of Scholarships and Financial Aid, the amount of the award is related to the total number of enrolled credit hours that apply toward the degree (for graduate students, such courses must be offered for graduate credit only, including 3000*, 4000* (G sections only), 5000 and 6000 level courses. OSU graduate certificate and master’s, specialist and, doctoral degree programs are federal aid-eligible programs, depending on a person’s personal circumstances.

In general, a graduate student must be enrolled in four hours of courses eligible for graduate credit each fall and spring semester, and two hours of courses eligible for graduate credit in the summer term, to be eligible for federal financial aid. Some students may be required to enroll in more hours in the fall or spring or summer to receive the full amount of federal financial aid. Students should verify with their financial aid adviser in the OSU Office of Scholarship and Financial Aid about the number of hours they are required to take. 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.

6.8 Enrollment as a Non-Degree Seeking or Graduate Student. Students with a bachelor’s degree are expected to enroll in the Graduate College unless they want to obtain another bachelor’s degree. If they enroll as an undergraduate student, the courses taken cannot be given graduate credit at a later date.

6.9 Graduate Student Enrollment in Undergraduate Courses.

Students admitted to the Graduate College may enroll in, or audit, undergraduate courses or course equivalents that do not carry graduate credit if approved to do so by their graduate faculty adviser. Such courses cannot subsequently be used as part of a graduate Plan of Study and are not generally covered by graduate tuition waiver programs.

Some 3000 and 4000 level courses are approved for both undergraduate and graduate credit; these courses are identified in the Course Catalog. Students are encouraged to consult with their program, advisor, and the Graduate College to determine whether these courses can offer graduate credit.

Graduate students who are enrolled for graduate credit in undergraduate courses (see Enrollment) generally offered in separate undergraduate and graduate sections. Enrollment in such a course by a graduate student will normally be in the graduate section; additional assignments at an intellectual level commensurate with that of gradu-
imate work when compared to that required for undergraduate credit, is required to earn graduate credit. Some graduate students may, however, wish to enroll in the undergraduate sections for undergraduate credit only (e.g., to complete additional courses specified in the graduate admission provisions). They may do so by completing the “Graduate Students Seeking Undergraduate Credit for 3000/4000 Courses” form and submitting it to the Office of the Registrar by the end of the second week of the regular semester, or by the end of the first week of the summer session, in which the 3000/4000 course is taken. Submission of this form implies that the student wishes to be graded using the same criteria and course completion requirements used for undergraduates in the course. Such courses may not subsequently be used as part of a graduate Plan of Study and are not generally covered by graduate tuition waiver programs.

6.10 Undergraduate Student Enrollment in Graduate Courses. An OSU undergraduate senior may take a limited number of courses for graduate credit toward an OSU degree program. The credits may not be utilized for both a baccalaureate degree or the graduate degree. The course instructor must be authorized to teach graduate credit (denoted in the Course Catalog), and the student must enroll in the graduate section (if enrolling in a 3000 and 4000 level course). The applicability of such graduate courses to a specific graduate program will be determined by the student’s graduate advisory committee when the student enrolls in the Graduate College and submits a Plan of Study for an advanced degree.

To receive graduate credit, a Graduate Credit for Seniors form must be completed by the student to receive graduate credit for courses taken. This form must be submitted prior to the end of the second week of class instruction of a regular semester or the first week of a regular summer session. The required form is available on the Graduate College’s website or in the Graduate College.

Such credit may be earned only if the following conditions are satisfied at the time of application:

1. Students must have a minimum overall (cumulative graduation/retention) undergraduate GPA of 3.00.
2. The total semester enrollment must not exceed 18 credit hours for a regular semester or nine credit hours for a summer session.
3. The student must be within 12 semester credit hours of completing requirements for the baccalaureate degree at the beginning of the semester or summer session in which courses are taken for graduate credit.
4. Admission to courses taken for graduate credit must have approval of the course instructor, the dean of the disciplinary college associated with the student’s major, and the dean of the Graduate College. No more than 15 semester credit hours taken while a senior may be approved for graduate credit. The student must earn a grade of "B" or higher in those courses for which he or she seeks graduate credit. Students are cautioned that institutions other than OSU may or may not allow courses taken for graduate credit during the senior year to be transferred into one of their graduate degree programs.

7.0 TIME TO DEGREE

Graduate College matriculation starts when a student first enrolls as an admitted degree seeking graduate student. That date will be used in calculating time limits for degree completion. Students are expected to complete the requirements for a graduate certificate, master’s, or specialist degree within seven years from first enrollment after admission to the graduate program. Students are expected to complete the requirements for a doctoral degree within nine years from first enrollment after admission to the graduate program. After the second week of fall/spring or first week of the eight-week summer session of enrollment to the Graduate College and submits a Plan of Study for an advanced degree. Any request for extension beyond the nine-year limit must be submitted to the Graduate College and approved by the Dean of the Graduate College.

1. Leave of Absence. OSU graduate students are expected to maintain active status through continuous enrollment from the time they matriculate until they graduate. Students who are not able to maintain active status are strongly encouraged to consult with their program, advisor, and Graduate College to determine whether requesting a leave of absence (LOA) is the most appropriate course of action. International students must consult with the International Students and Scholars (ISS) office to ensure compliance with Federal immigration policy. Example situations that may lead a student to explore a leave of absence include medical, personal, employment and military service. Students who do not have an approved leave of absence and are not continuously enrolled may experience negative consequences related to academic, visa, financial aid, and other student issues – see University policies and guidelines for additional information. A student status update (G status and credit) is generally required for a leave of absence. Please see http://gradcollege.okstate.edu/leave-of-absence-policy for additional leave of absence information.

8.0 ENROLLMENT PROCEDURE

Students are strongly encouraged to review the course offerings for the upcoming semester prior to attempting to enroll. For more information about enrollment and classes go to http://my.okstate.edu

First semester graduate students must first obtain their adviser’s clearance prior to attempting to enroll. Non-degree seeking students may be granted enrollment clearance through the Graduate College. Non-degree seeking students will be provided assistance with selecting coursework, issues surrounding the transferability of special student credits, applying to degree-seeking programs, and other academic topics.

If the student has not completed a Plan of Study or if this is the first semester as a graduate student, the student should consult with the graduate faculty adviser. The graduate faculty adviser can provide information about required courses, course sequencing, and other information in order to select appropriate courses. The adviser should give approval for course selections prior to enrollment. All graduate students must complete Responsible Conduct of Research (RCR) requirements prior to the submission of a Plan of Study. A student should consult with his or her graduate coordinator as to what these requirements are in his or her graduate program. After the Plan of Study is approved by the Graduate College until the program has certified RCR completion.

If a Plan of Study has been completed, the student should verify that all planned courses are listed on the Plan of Study. Students should consult with their adviser any time they deviate from courses listed on the Plan of Study. The ultimate responsibility for completing degree requirements rests with the student. Students who have active academic, financial or advising holds must clear these holds prior to attempting to enroll. Students can view any holds by logging into the Self Service portal at my.okstate.edu.

8.1 Last Day to Enroll. Information regarding dates to enroll, when courses begin, and last days to drop are listed in the Class Schedule available at the Office of the Registrar’s website at registrar.okstate.edu.

Generally, the sixth class day of a regular semester or the third class day of the eight-week summer session is the last day a course may be added (nonrestrictive) via the SIS enrollment system. A short course may be added no later than the first day of the short course.

8.2 Late Enrollment. Graduate students should enroll prior to the end of the official enrollment deadline for the semester. If they do not, there are limited options to enroll in classes. The options available to the student depend on the number of weeks past the deadline and the student's current enrollment status. During the second week of fall/spring or first week of the eight-week summer session:

- If a student wishes to add course hours or is not currently enrolled, they must submit a drop/add card or Trial Study signed by their adviser giving permission to enroll.
- If the student is adding a course they must have the instructor's signature on the add/drop card or Trial Study.
- If a student is non-degree seeking, they must have the signature of the dean of the Graduate College and the instructor of the course in which they wish to enroll.

After the second week of fall/spring or first week of the eight-week summer session graduate students may add any course which has not started.

8.3 Other Enrollment. In order to enroll in a given semester, a student must have received grades for at least six semester credit hours (including “I” and “R” and excluding “W”) in the 12 months prior to the beginning of that semester.

9.0 COURSES OFFERED THROUGH OUTREACH

Courses offered through Outreach are considered equivalent to courses offered through traditional formats. Any student wishing to enroll in a graduate credit course offered through outreach must make application for admission to the Graduate College at OSU.

10.0 CORRESPONDENCE CREDIT

OSU does not offer graduate-level courses by correspondence and does not accept credit taken by correspondence toward an advanced degree. Graduate students may enroll in correspondence courses; however, such courses will not be considered as part of minimum graduate degree or certificate requirements. Tuition waiver programs are not applicable to courses taken through correspondence study. Courses taken through correspondence do not count toward minimum enrollment requirements for any graduate student.

11.0 ACADEMIC REGULATIONS

Refer also to “University Academic Regulations” section in the Catalog.

11.1 Graduate Credit Courses. Courses numbered 5000 and above are for graduate students. Seniors who have obtained prior approval from the Graduate College may enroll in graduate level courses in accordance with the provisions of “Enrollment” stated earlier.

Courses numbered 3000 and 4000 that are identified by an asterisk in the "Course Descriptions" of the Catalog can be taken by graduate students and 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. In order to receive graduate credit, students must enroll in the G section of the course. Graduate students enrolled in these courses will be considered
as taking the courses for graduate credit (unless they pre-declare the course as taken for undergraduate credit; forms are available in the Graduate College) and will be expected to complete additional assignments at an intellectual level commensurate with graduate level work as proposed by the instructor. Courses that are not identified by an asterisk may not be used to fulfill requirements for a graduate degree.

11.2 Grades for Thesis (5000) and Dissertation (6000). The grade of “SR,” indicating satisfactory research progress, or “UR,” indicating unsatisfactory progress, or “UR,” indicating an incomplete (see section 6.2 “Grade Interpretation” in the “University Academic Regulations” chapter of the Catalog) will be assigned to thesis (5000) and dissertation (6000) courses at the end of the semester in which the work is taken. Theses are permanent and have no impact on a student’s grade point average, but affect the graduate student’s academic standing. Only courses in which a grade of “SR” (or a previously-awarded grade of “R,” “A,” “B,” or “C”) is earned may be used toward minimum degree requirements.

11.3 Grades for Creative Component Courses. The “R” grade can be assigned in a creative component portion of a master’s degree by the graduate program concerned. The grade of “R” 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.

11.4 Pass-No Pass Grading System. Graduate students may take a course utilizing the Pass-No Pass grading system with the consent of their faculty advisers, but courses taken under this system cannot be used on a Plan of Study to meet graduate degree requirements. A student who chooses the pass-no pass option must do so by the last date on which a course may be added. See section 6.6 “Grades and Grading” in the “University Academic Regulations” chapter of the Catalog.

11.5 Pass-Fail Grading System. Graduate students may take courses utilizing the Pass-Fail grading system with the consent of their faculty advisers; however, only a limited number of these hours can be used on a Plan of Study to meet graduate degree requirements and these require advance permission of the dean of the Graduate College. Pass-Fail courses are typically internship, practicum, seminar, special problems and student teaching. See section 6.7 “Grades and Grading” in the “University Academic Regulations” chapter of the Catalog.

11.6 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. No course with a grade of “D” or “F” can be used on the Plan of Study to satisfy the degree course requirements. At the graduate level, a grade of “D” or “F” is a failing grade that can result in dismissal by the dean of the Graduate College, regardless of academic standing. In determining whether a student has met minimum requirements for a degree, grades for courses on the Plan of Study are averaged separately from courses not on the Plan of Study. In order to continue enrollment in the Graduate College, a graduate student is expected to maintain a minimum graduate GPA of at least 3.00. In order to receive a degree, a student must have a minimum 3.00 GPA in the courses work for the Plan of Study.

No course with a grade below "C" can be used as part of the minimum number of semester credit hours required for the graduate degree. Some programs have more stringent requirements. The graduate program should be consulted concerning minimum grade requirements.

11.7 Annual Review of Student Progress. The graduate program in which a student is seeking a graduate degree will provide a mechanism for assessing the student’s progress towards degree completion at least once annually. If the student is assessed not to be making adequate progress, then a specific plan to address and correct any inadequacies in progress will be prepared in a written document provided to the student and the dean of the Graduate College annually by June 30. Failure to correct these inadequacies may result in termination from the graduate program and/or Graduate College.

11.8 Academic Progress. Each semester, the dean of the Graduate College reviews the academic progress of any graduate student who receives a grade of “C” or lower in a class or “UR” in research. Programs are notified which of their students have received a “C” or lower and of the dean of the Graduate College’s academic progress decision. At the discretion of the dean of the Graduate College, one of four actions based on the student’s current semester progress and past academic history will be taken as follows:

1. Program Notice. The program is notified and is encouraged to review the student’s performance to determine if any program intervention is needed.

2. Academic Probation. If a student’s overall GPA drops below 3.00, if a “UR” grade is earned, or if the dean of the Graduate College judges the student’s overall academic performance so warrants then s/he is subject to being placed on academic probation. At the discretion of the dean of the Graduate College, probation may be removed at the end of the semester only after the student brings his or her cumulative GPA for courses eligible for graduate credit taken at OSU to 3.0 or greater, earns a SR grade, and/or completes all degree requirements, whichever comes first.

3. No Further Enrollment Without Program Consent (NFEWPC). The student has consistently performed below the acceptable standards for graduate students. The student is not permitted to continue graduate study at OSU.

4. No Further Enrollment (NFE). The student wishes to withdraw from all courses and will withdraw from graduate study. The student is not permitted to take any further graduate courses without the approval of the dean of the Graduate College and the Graduate College.

11.9 Course 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 the announced grading policy. The student should consult the “Student Rights and Responsibilities” or contact the Office of Academic Affairs for information regarding initiating the appeals process.

11.10 Appeals of Research Grades and Non-grade Issues. A student wishing to appeal a “UR” grade issued for a research course (5000 or 6000), or an academic issue not involving a grade should contact the dean of the Graduate College about the appeals process available to graduate students (http://gradcollege.okstate.edu/content/appeals-policy).

11.11 Advisory Committee Decisions-Criteria for Passing. In decisions resulting from a vote of a graduate student advisory committee (e.g., PhD candidacy exam, final thesis defense, or approving a dissertation), a pass requires that the thesis/dissertation adviser vote in the affirmative and that no more than one member of the committee dissent. Graduate programs may impose more stringent requirements.

11.12 Discontinuance From a Program. In instances when a student reaches a situation where it is no longer possible to complete the intended degree (e.g., failure to pass the all permitted attempt exam, comprehensive exam or candidacy exam), and is still in good academic standing with the Graduate College, a domestic student may be considered for transfer to non-degree seeking student status and be subject to all non-degree seeking student rules (including maximum number of hours that can later be used toward a graduate degree or certificate program). If visa restrictions prohibit the student’s matriculation as a non-degree seeking student, the Graduate College will inform the Office of International Students and Scholars of the student’s impending dismissal from the program; the student will have until the end of the semester to be admitted into another graduate program. This change in status is initiated with a letter from the unit head or graduate program coordinator to the student, course director or dean of the Graduate College, and student, and is still in good academic standing with the program. Dismissal from an existing graduate program will result in the student’s potential dismissal from the program. In accordance with graduate program policies, students have a limited number of days from the intent to dismiss letter date to initiate the appeals process in the program. Graduate students should contact the dean of the Graduate College about the appeals process (http://gradcollege.okstate.edu/content/appeals-policy).

11.13 Second Graduate Degrees. The Oklahoma State Regents for Higher Education do not allow students to obtain a second degree in the same “major” as the first degree, even if the options are different. For example, it is not possible to earn both an MS degree in Physics with an option in Medical Physics and an MS degree in Physics with an option in Optics and Photonics. Completion of requirements for more than one option may be noted on the official transcript, but a second degree will not be awarded. Additionally, because of the OSRHE requirement for a coursework common core within a master’s degree options, it should not be assumed that obtaining an additional option within the same degree program and level will be possible. Careful discussions and planning with the Graduate Program Coordinator prior to admission is imperative, if such study is desired.

12.0 RESPONSIBLE CONDUCT OF RESEARCH

All graduate students must complete Responsible Conduct of Research (RCR) training requirements prior to the submission of a Plan of Study. A student should consult with his/her graduate coordinator as to which these requirements are in their graduate program. Graduate programs may impose more stringent requirements. A Plan of Study will not be approved by the Graduate College until the graduate program has certified RCR completion. Information and University policies regarding RCR can be found at http://compliance.vpr.okstate.edu/Ethical/ethical-index.aspx.
10.1 Graduation Commencement and Diplomas. The University holds one Gradu-ate Commencement Ceremony at the close of the fall and spring semesters. Students who plan to meet graduation requirements at the close of the summer session are invited and encouraged to participate in the Graduate Commence-ment Ceremony held in the close of the previous spring semester. Although attend ance is not compulsory, the University encourages all candidates for advanced degrees to participate in the Graduate Commencement Ceremony. Candidates should also notify the Office of the Registrar of the address to which the diploma should be mailed.

10.2 Records and Transcripts. All permanent records are stored in the Office of the Registrar. 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.

16.0. INTERDISCIPLINARY GRADUATE PROGRAMS OFFERED AT OSU-STILLWATER

OSU has a series of interdisciplinary graduate programs designed to provide students with a breadth of knowledge that is not ordinarily found in traditional programs. Descriptions are given below for the following interdisciplinary programs: Environmental Science (MS, PhD), Food Science (MS, PhD), Interdisciplinary Science (MS), International Studies (MS), Photonics (PhD), Plant Science (PhD), and Public Health (MPH).

16.1 Environmental Science
Scott Stoodley, Ph.D.—Director
Ken Ede, PhD—Associate Director, OSU-Tulsa
Chandler Russ—Program Coordinator

The Environmental Science Graduate Program (ESGP) is operated under the administration of the Graduate College at OSU. Due to its interdisciplinary nature, the ESGP attracts and produces students capable of thinking beyond a single discipline. Our unique approach to graduate education offers flexibility with locations in Stillwater and OSU-Tulsa. Our program is one of the oldest programs in the nation having been founded back in 1977. These ESGP graduates have gone on to be leaders in every facet of the environmental field.

Our students are housed in one of many departments including Agricultural Economics, Economics, Leisure Studies, Plant & Soil Sciences, Natural Resources Ecology & Management, Biosystems and Agricultural Engineering, Geology, Geography, Political Science, Educational and School Psychology, School of Teaching and Curriculum Leadership, Sociology, and Zoology. There are over 128 faculty affiliated with the ESGP at OSU and over 70 of these have served as faculty advisors.

We offer our graduate students either a Master of Science or PhD degree. Each student has a unique opportunity to develop a degree plan that specifically addresses their individual career goals. Degree integrity is ensured through the guidance of the student's graduate advisor and committee.

16.1.1 Programs of Study. The breadth of offerings at OSU affords flexibility to the student interested in specific environmental career tracks. A student can design a unique degree plan to target a particular focus area that meets his or her professional goals or can follow structured plans recommended for specializations in:

- Environmental Management
- Environmental Management-Professional Science Masters (PSM)
- Environmental Education
- Environmental Conflict Management
- Environmental Sustainability
- Environmental Chemistry-Toxicology and Risk Assessment
- Water and Watershed Management

The student's graduate advisory committee assists the student in preparing a Plan of Study to assure focus, breadth and quality.

16.1.2 Program Assessment Portfolio. The ESGP assesses its curriculum each year to ensure that students are receiving the instruction needed to succeed in environmental careers. To accomplish this assessment, selected environmental faculty members review materials generated by students in the program. Each student must develop and maintain a collection of portfolio materials that demonstrate progress toward the degree. The portfolio must be submitted during the last semester of the student's enrollment.
16.1.3 Master of Science Degree. To obtain an MS degree in environmental science, the student must complete a 36-credit-hour course of study. This must include fifteen hours of core curriculum (ENVR 5303, ENVR 5123, three hours in research methods or statistics, three hours in social science and three hours in natural science). Each student must also either complete a six-hour research thesis, a six-hour research report, or research project. The remaining credit hours can be taken as electives that focus on the student’s area of particular interest. Students create their original Plans of Study with the assistance of their advisor and committee. It must be completed prior to the end of the second semester (excluding summer sessions) of enrollment.

For the MS degree with a specialization in Environmental Management, students must take 21 credit hours of science courses. In addition, they are required to take 5503 Environmental Management Practicum and 5510 Environmental Management Internship and Report. Students with this degree specialization are not required to take social science requirements.

16.1.4 Doctor of Philosophy Degree. The Doctor of Philosophy degree requires a minimum of 60 credit hours beyond an MS degree. This includes a minimum of 36 to 45 hours of course work consisting of six hours of a skill component, ENVR 5303, ENVR 5123, and ENVR 6011. Course hours should reflect the biological, social, and physical aspects of the concentration area. Research and courses should reflect the student’s professional goals. A dissertation (ENVR 6000) is required and consists of a minimum of 15 credit hours. At least 75 percent of the courses for the PhD degree must be at the 5000 level or above, including dissertation research hours. The student must successfully pass a written and oral qualifying exam after course work is completed. Students create their own Plans of Study with the aid of their advisor and committee. It must be completed prior to the end of the third semester (excluding summer sessions) of enrollment.

16.1.5 Admission. Each student seeking admission to the Environmental Science Graduate Program must submit the following materials: (1) An official Graduate College application for admission and a nonrefundable fee, (2) Official transcripts for all college level courses, (3) A statement of career goals, including competencies to be gained during program enrollment, (4) Three letters of recommendation discussing the student’s potential for graduate work, and (5) GRE test scores (use institution code 6546 and department code 0502). International students must also earn a TOEFL score of at least 90/80/57/77/97 and submit a financial affidavit for the amount required by OSU. To be admitted, applicants must have earned a college grade point average of 3.00 on a 4.00 scale. Students are required to have completed college-level courses that address the fundamentals and principles of chemistry, biology, ecology, and algebra prior to admission. All applications to the ESGP should be submitted at least 60 days before the opening of the semester in which they wish to enroll. International students should supply all application materials by March 1st for summer enrollment, June 1st for fall enrollment, and October 15th for spring enrollment.

It is recommended that students identify an advisor prior to admission to the program. The ESGP Program Coordinator will assist the student with this process. If the student is unable to identify a permanent advisor, then a temporary advisor will be appointed. However, the student must identify a permanent advisor prior to completion of the ninth credit hour in order to be able to enroll in the following semester.

16.1.6 Financial Assistance. Graduate research assistantships and other funding opportunities are often available through affiliated environmental science faculty members. The initial application should specify the student’s interest in an assistantship.

Additional information about the environmental science graduate program can be found at esgp.okstate.edu.

16.2 Food Science
William McGlynn, PhD—Program Coordinator

The following departments participate in the food science program: Agricultural Economics, Animal Science, Biochemistry and Molecular Biology, Biosystems and Agricultural Engineering, Horticulture, Plant and Soil Science, and Nutritional Sciences.

Food science is an interdisciplinary graduate program designed to provide an opportunity for students to acquire basic knowledge of the 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 need for food science training in the broad areas of food science to staff research and quality assurance facilities of industry, universities, and the federal government.

16.2.1 Program Assessment Portfolio. Admission to either the Master of Science or Doctor of Philosophy degree program requires an undergraduate major in animal science, biochemistry, dairy science, food science, human nutrition, microbiology, or microbiology. 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 advisor prior to official admission. The GRE is required for admission. Three letters of reference are also required.

16.3 International Studies
Joel Jnswoold, PhD—Director of Academic Programs

Leaders in today’s global community require a broad international understanding as well as specific knowledge within a discipline. For this reason, the School of International Studies (SIS) offers multi-disciplinary graduate programs: the Master of Science in International Studies, the Master’s International Program (MIP), and the graduate certificates in Global Issues and International Disaster and Emergency Management (IDEM). The MIP combines the MS in International Studies with service in the Peace Corps. For more information contact l-study@okstate.edu.

The SIS graduate programs enroll approximately 80 students from the U.S. and 20 different countries. This dynamic group is equally divided between men and women and between U.S. and international students. Graduates become part of a broad international network of friends and colleagues positioned to meet tomorrow’s challenges.

16.3.1 Master of Science in International Studies. Students complete 33 credit hours, including four core courses, four - five courses in a designated focus area, and two - three elective courses. Students are encouraged to participate in an international internship or other international experience. MS students complete their degree with either a thesis or a creative component.

16.3.2 Master’s International Program (MIP). This program provides the opportunity to incorporate Peace Corps service into the MS in International Studies degree plan. Candidates may receive up to one credit hours in the SIS master’s program in connection with their Peace Corps service.

16.3.3 Certificate in Global Issues. Taken on its own or in conjunction with another graduate program, students can receive a graduate certificate by taking 15 credit hours in International Studies. Three of the four core courses and two additional courses are selected from a focus area.

The more than 150 faculty members affiliated with the School of International Studies (SIS) come from every academic college at OSU and are selected from a rich variety of subjects taught by nationally and internationally recognized scholars. Besides the interdisciplinary core courses, students concentrate in one of five focus areas:

16.3.4 Certificate in International Disaster and Emergency Management (IDEM). Taken on its own or in conjunction with another graduate program, students can receive a graduate certificate by taking 18 credit hours in International Studies and Fire and Emergency Management Administration.

The International Studies core includes an international experience in either governmental or non-governmental organizations active in international disaster and emergency management. A study abroad component will be strongly encouraged for those students who do not have significant international experience. In addition, students will be required to complete an individual study with an expert in the field.

The Fire and Emergency Management Administration core consists of two courses that, together, can be taken as the fundamentals of International Disaster and Emergency Management, consisting of POLS 5693, which serves as the introduction to International Emergency Management and will introduce students to the basic concepts of emergency management administration, and POLS 6203, which is focused more directly on the practical aspects of emergency management in an international setting.

The electives have been structured to allow students to meet their individual needs and professional interests, thus allowing for some specialization within the structure of the certificate program.

16.4 Interdisciplinary Science
Jean Van Delinder, PhD—General Program Coordinator

The Master of Science in Interdisciplinary Sciences is for students who wish to increase their competence in a particular thematic area by taking a series of courses in several disciplines. This interdisciplinary approach provides educational opportunities leading to a variety of careers. Interdisciplinary sciences consist 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.

16.4.1 Admission Requirements. An undergraduate grade-point average of 3.00 is required for unqualified admission. Students with a grade-point average between 2.50 and 3.00 may be admitted on a probationary basis.

Applications to the program should include: (1) a cover letter indicating the professional goals and professional advancement objectives to be obtained through this program; (2) transcripts from all schools previously attended; (3) three letters of recommendation from persons who can describe abilities, interest, and motivation as a student; (4) a proposed course of study with an endorsement from an OSU faculty adviser.

Particular courses are not specified for the degree; the advisory committee can assist in selecting appropriate courses. The course of study must include at least 21 credit hours at the graduate level (5000 or above). Up to nine graduate hours can be transferred from a regionally-accredited graduate program with consent of the advisory committee. The student chooses any of the three master’s degree plans: (1) a 30-hour plan, including a six-hour research thesis;
Any student admitted to the program allows students to experience many facets of plant science and affords the opportunity for the exceptional PhD student to develop an academic and research program tailored to his or her individual interests and needs. Faculty participating in this program is the completion of a faculty directed research project and the defense of the resulting dissertation. A detailed Plan of Study specific to the research specialization chosen is formulated by the student in consultation with the advisory committee.

5.2 Research Opportunities. The faculty emphasizes both basic and applied interdisciplinary research. To accomplish this, in addition to a myriad of state-of-the-art laser systems and computational facilities, the OSU campus houses two molecular beam epitaxial (MBE) growth and analysis facilities and unique optoelectronics THz beam systems. Current research programs include quantum optics, quantum cryptography, "whispering gallery modes," experimental and calculational programs in nanostructured materials, optical fiber communications and optical circuits for computing as well as high-speed optoelectronics applications to fundamental and applied problems in the THz frequency range. Other investigations center on the preparation and characterization of specialty-doped insulators and semiconductors for use as lasing materials, non-linear optical crystals for data storage and holographic applications, and photonic-based chemical, physical and biochemical environmental sensors. Research programs in the biomedical applications of lasers at both the basic research and clinical application levels seek to understand the interaction of light with biological materials at the tissue, cellular and molecular levels.

5.3 Admission Requirements. Students with a BS degree in physics, electrical engineering, chemistry (or related fields) are welcome to apply to the PhD photonics program. No additional tests (such as the GRE) are required, but such scores may be submitted in support of an application. A TOEFL score of at least 600 is required of international students.

Applications should include: (1) a cover letter indicating the program of specialization and whether the student wishes to be considered by that program for a fellowship or teaching assistantship; (2) a personal statement of interests and goals, noting especially how they relate to the degree in photonics; (3) transcripts of all previous academic work (an unofficial transcript will suffice for the application; official transcripts are required by the Graduate College after admission); and (4) the names and email addresses of three persons who have been requested to submit letters of reference.

5.4 Financial Aid. Most students entering the photonics programs are offered a graduate teaching assistantship in their home department. A student pursuing an original research project may receive support as a graduate research assistant (RA) through grants and contracts to the individual faculty member who serves as the adviser.

16. Plant Science
William Hemky, PhD—Program Coordinator

Solutions to current problems in plant science often require integration of knowledge from a number of disciplines. The Plant Science program at OSU provides the opportunity for the exceptional PhD student to develop an academic and research program tailored to his or her individual interests and needs. Faculty participating in this program comes from the departments of Biochemistry and Molecular Biology, Botany, Entomology and Plant Pathology, Forestry, Horticulture and Landscape Architecture, Microbiology and Molecular Genetics, and Plant and Soil Science. The multidisciplinary nature of this program allows students to experience many facets of plant science and afford them the flexibility to seek employment in a variety of settings in the plant sciences. Students, in consultation with their graduate committees, develop a program in one of three specialization areas (cellular and molecular, organismal or ecological), but are expected to develop a sound foundation across all disciplines of plant study.

16.1 Admission Requirements. Application for admission includes a statement defining plant science interests, a resume, three letters of reference, an abstract of the Master of Science thesis (if applicable), GRE scores (the Advanced Biology GRE is also desirable), and a minimum TOEFL of 88/IBT/570PBT. A student must be accepted by a faculty adviser prior to official admission.

16.2 Financial Assistance. Students seeking financial assistance should inquire directly to the department(s) and faculty of interest within the plant science program.

16.5 Photonics
Ali Rosenberger, Ph.D/Rama Ramakumar, Ph.D—Program Coordinator

OSU provides a multidisciplinary program leading to the PhD degree in photonics. The program draws on the faculties of the departments of Physics and Electrical and Computer Engineering. A student typically chooses either of these as his or her “home department” on the basis of academic background and research interests. A multidisciplinary program of course work is tailored to the goals of each individual student mentored by a chosen faculty member from the home department and guided by the advisory committee. The PhD program provides biophotons specialization with faculty from the departments of Chemistry or Microbiology and Molecular Genetics, or the College of Veterinary Medicine, serving as research advisers. For information regarding the Photonics option in either the MS in Physics or MS in Electrical and Computer Engineering, see the relevant departmental section of the Catalog.

16.5.1 Doctoral Program Requirements. A total of 90 credit hours beyond the BS (60 beyond the MS) degree are required for the PhD in photonics. All students must form a preliminary advisory committee to guide them initially in the photonics PhD program. Eventually a student chooses a permanent research adviser who chairs the graduate research committee. Course work is taken from the basic and advanced courses offered by the Departments of Physics and Electrical and Computer Engineering. Courses from other departments may also be recommended by the graduate research committee. In addition, students are required to take two or more photonics tutorials, offered by faculty in their research lab, emphasizing particular research problems and techniques. A preliminary exam is administered usually during the student’s second year in the PhD program. Admission to PhD candidacy follows the successful completion of the qualifying exam. The focus of the PhD program is the completion of a faculty directed research project and the defense of the resulting dissertation. A detailed Plan of Study specific to the research specialization chosen is formulated by the student in consultation with the advisory committee.

16.5.2 Research Opportunities. The faculty emphasizes both basic and applied interdisciplinary research. To accomplish this, in addition to a myriad of state-of-the-art laser systems and computational facilities, the OSU campus houses two molecular beam epitaxial (MBE) growth and analysis facilities and unique optoelectronics THz beam systems. Current research programs include quantum optics, quantum cryptography, “whispering gallery modes,” experimental and calculational programs in nanostructured materials, optical fiber communications and optical circuits for computing as well as high-speed optoelectronics applications to fundamental and applied problems in the THz frequency range. Other investigations center on the preparation and characterization of specialty-doped insulators and semiconductors for use as lasing materials, non-linear optical crystals for data storage and holographic applications, and photonic-based chemical, physical and biochemical environmental sensors. Research programs in the biomedical applications of lasers at both the basic research and clinical application levels seek to understand the interaction of light with biological materials at the tissue, cellular and molecular levels.

16.5.3 Admission Requirements. Students with a BS degree in physics, electrical engineering, chemistry (or related fields) are welcome to apply to the PhD photonics program. No additional tests (such as the GRE) are required, but such scores may be submitted in support of an application. A TOEFL score of at least 600 is required of international students.

Applications should include: (1) a cover letter indicating the program of specialization and whether the student wishes to be considered by that program for a fellowship or teaching assistantship; (2) a personal statement of interests and goals, noting especially how they relate to the degree in photonics; (3) transcripts of all previous academic work (an unofficial transcript will suffice for the application; official transcripts are required by the Graduate College after admission); and (4) the names and email addresses of three persons who have been requested to submit letters of reference.

16.5.4 Financial Aid. Most students entering the photonics programs are offered a graduate teaching assistantship in their home department. A student pursuing an original research project may receive support as a graduate research assistant (RA) through grants and contracts to the individual faculty member who serves as the adviser.

16.6 Plant Science
William Hemky, PhD—Program Coordinator

Solutions to current problems in plant science often require integration of knowledge from a number of disciplines. The Plant Science program at OSU provides the opportunity for the exceptional PhD student to develop an academic and research program tailored to his or her individual interests and needs. Faculty participating in this program comes from the departments of Biochemistry and Molecular Biology, Botany, Entomology and Plant Pathology, Forestry, Horticulture and Landscape Architecture, Microbiology and Molecular Genetics, and Plant and Soil Science. The multidisciplinary nature of this program allows students to experience many facets of plant science and affords them the flexibility to seek employment in a variety of settings in the plant sciences. Students, in consultation with their graduate committees, develop a program in one of three specialization areas (cellular and molecular, organismal or ecological), but are expected to develop a sound foundation across all disciplines of plant study.

16.6.1 Admission Requirements. Application for admission includes a statement defining plant science interests, a resume, three letters of reference, an abstract of the Master of Science thesis (if applicable), GRE scores (the Advanced Biology GRE is also desirable), and a minimum TOEFL of 88/IBT/570PBT. A student must be accepted by a faculty adviser prior to official admission.

16.6.2 Financial Assistance. Students seeking financial assistance should inquire directly to the department(s) and faculty of interest within the plant science program.

16.7 Public Health
Julie Crof, Ph.D., MPH—Program Director

The Oklahoma State University Master of Public Health (MPH) program focuses on training public health professionals to improve health and wellbeing of rural and underserved populations. Students are encouraged to identify a rural community or underserved population as the focus of class projects. In doing so, students will have the opportunity to assess the needs of that community or population, and to thoughtfully create programs for preventing disease within that community or population. Prevention efforts often include a focus on lifestyle and health behaviors. Current student study health behaviors and health outcome areas that include: the use of alcohol, tobacco, other drugs, mental health, disabilities, zoonotic diseases, nutrition and food security, obesity, physical activity, maternal and child health, teen pregnancy and sexual health. These students are meaningfully engaged with rural communities throughout Oklahoma and underserved populations that include indigenous populations, racial minorities, recent immigrants, and sexual minorities.

16.7.1 Admission Requirements. Application for admission includes a statement of purpose defining professional goals and interest in public health, a resume, three letters of reference, GRE, MAT, GMAT or MCAT scores.

17.0 GRADUATE CERTIFICATE PROGRAMS OFFERING

Graduate certificate programs offer students the opportunity for focused study of a body of knowledge at the graduate level, leading to the award of an academic transcripted academic credential that can be earned in a relatively short time. Graduate certificate programs can serve both as a stepping stone onto more advanced study leading to a master’s or doctoral degree or as a stand alone educational achievement to assist an individual in their career. Many OSU graduate certificate programs are offered online or on the graduate-serving campuses (OSU-Stillwater, OSU-Tulsa and Center for Health Sciences-Tulsa).

In addition, many graduate certificate programs allow students to enroll as either a certificate-seeking or a degree-seeking graduate student. Certificate-seeking students are not eligible for GTA or GRA positions or associated benefits, but may be eligible for federal financial aid. Below are the current graduate certificate offerings at OSU – please see the Graduate College website for additional information (http://gradcollege.okstate.edu/content/graduate-certificates).

Aerospace Security
Big Data Analytics
Bioenergy and Sustainable Technology
Bioinformatics
Business Data Mining
Business Sustainability
College Teaching
Engineering & Technology Management
Entrepreneurship
Family Financial Planning
Gerontology
Global Issues
Grassland Management
Information Assurance
Interdisciplinary Toxicology
International Disaster and Emergency Management
Marketing Analytics
Non-Profit Management
Online Teaching
Public Health
Teaching English to Speakers of Other Languages
17.2 Basic Requirements. A graduate certificate requires completion of a minimum of 12 credit hours of course work eligible for graduate credit, of which at least two-thirds must be at the 5000 level or above. Specific certificate programs may have more stringent requirements.

17.3 Transfer of Courses. With the approval of the graduate program and the Graduate College, up to three hours of graduate-level credit from another institution may be used toward certificate requirements. The GPA must be at least 3.0 on any transfer credit.

17.4 Academic Standing. A grade-point average of “B” (3.0) is required on courses applicable to a graduate certificate. No grade lower than a “C” may be used as part of the minimum requirements for the certificate. Individual certificate programs may have more stringent requirements.

17.5 Plan of Study and Certificate Completion Procedures. Upon application to a graduate certificate program, a student should complete a plan of study listing the courses intended to be used in earning the certificate. This plan must be approved by the graduate program and the Graduate College prior to recording the credential on the student’s academic record. During the semester of anticipated certificate completion, the student must complete an Application for Certificate Completion, which is submitted to the Office of the Registrar. This action will cause the graduate certificate to be recorded on the official transcript and a certificate will be printed, provided all requirements have been met.

17.6 Special Program - Certificate Program in Education. OSU offers Oklahoma State Department of Education-approved post-bachelor’s certification programs for elementary school principals, school counselors, reading specialists, library/media specialists, and secondary school principals. Certification is also offered in speech and language pathology and in special education.

Master’s degrees are available in most of these programs and doctorates are available in many.

Post-master’s level certification programs are available for school superintendents and school psychologists. Inquiries concerning any aspect of the Professional Education program should be addressed to the Office of Professional Education at 405.744.6252 or the head of the unit/department/school offering the program.

18.0 GRADUATE MINORS

Graduate minors offer students the opportunity to pursue coursework outside, or ancillary to, the requirements for the degree earned. Minors may not be earned independently of a degree granted by OSU. OSU offers graduate minors in the following areas:

- Agribusiness
- Agricultural Economics
- Entomology
- Plant Pathology
- Statistics

18.1 Basic Requirements. A graduate minor must include between nine and eighteen hours, inclusive, of coursework eligible for graduate credit. At least two-thirds of the applicable coursework must be at the 5000-level or above.

Transfers of courses: No more than one-third of the credit for the minor may be earned through transfer credit of courses taken at other institutions, with the approval of the coordinator of the minor and the dean of the Graduate College. Transfer credit will only be considered if it was earned when the student was post-baccalaureate (i.e., after earning a bachelor’s degree) at another accredited institution.

All courses used as transfer credit must have a grade of “B” or better.

Grades earned in courses transferred to Oklahoma State University will not be used in calculating the cumulative GPA.

18.2 Academic Standing. A grade-point average of “B” (3.0) is required on courses applicable to a graduate minor. No grade lower than a “C” may be used as part of the minimum requirements for the minor. Individual minors may have more stringent requirements.

18.3 Plan of Study and Minor Completion Procedures. Graduate students can declare a minor by entering it in the appropriate section of an original or revised Plan of Study submitted to the Graduate College prior to conferral of the degree. The pursuit of graduate minors is not denoted on the academic transcript while in progress. Graduate students can file for minor completion in the semester that the required courses for that minor will be finished. At that time, the graduate student should ask the coordinator for that minor area to submit a memorandum to the Graduate College certifying the completion of the minor requirements and listing the courses required for the minor. A notation of the minor will be added to the student’s transcript after the conferral of a degree. The courses required for a graduate minor may be included on a Plan of Study for any graduate degree or they may be in addition to the degree requirements, depending on the overlap between the minor and the degree Plan of Study. However, the graduate minor must be earned in an academic field other than the student’s graduate program or degree option (for example, a graduate student who is majoring in economics could not receive a graduate minor in economics).

18.4 Time Limits. Requirements for the graduate minor must be completed at the time of conferral of the primary degree. All graduate courses used to complete the minor must have been taken within ten years prior to the date of completion of the graduate minor requirements.

19.0 MASTER’S DEGREE PROGRAMS

19.1 Abbreviations.

- MA - Master of Arts
- MAG - Master of Agriculture
- MAT - Master of Athletic Training
- MBA - Master of Business Administration
- MFA - Master of Fine Arts
- MM - Master of Music
- MPH - Master of Public Health
- MS - Master of Science

19.2 Current Degree Inventory.

Accounting, MS
Agricultural Communications, MS
Agricultural Economics, MS
Agricultural Education, MS
Animal Science, MS
Applied Statistics, MS
Art History, MA
Athletic Training, MAT
Aviation and Space, MS
Biochemistry and Molecular Biology, MS
Biomedical Sciences, MS
Biosystems and Agricultural Engineering, MS
Botany, MS
Business Administration, MBA
Business Analytics, MS
Chemical Engineering, MS
Chemistry, MS
Civil Engineering, MS
Communication Sciences and Disorders, MS
Computer Science, MS
Counseling, MS (Mental Health Counseling; School Counseling)
Creative Writing, MFA
Design, Housing and Merchandising, MS (Apparel Design and Production, Interior Design; Merchandising; Retail Merchandising Leadership)
Economics, MS
Educational Leadership Studies, MS (College Student Development; Higher Education; School Administration)
Educational Psychology, MS (Educational Psychology; Educational Research and Evaluation; School Psychometrics)
Educational Technology, MS (Educational Technology; School Library Media)
Electrical Engineering, MS (Control Systems; Optics and Photonics)
Engineering and Technology Management, MS
English, MA
Entomology and Plant Pathology, MS (Entomology; Plant Pathology)
Entrepreneurship, MS
Environmental Engineering, MS
Environmental Science, MS (Environmental Management Professional Science Master’s)
Family Financial Planning, MS
Fire and Emergency Management Administration, MS
Food Science, MS
Forensic Sciences, MS (Arson and Explosives Investigation; Forensic Document Examination; Forensic Science Administration)
General Agriculture, MAG (Agribusiness; Agricultural Economics; Agricultural Education; Agricultural Leadership; Animal Science; Entomology; Horticulture; Natural Resource Ecology and Management; Plant Pathology; Plant Science; Soil Science)
Geography, MS
Geology, MS
Graphic Design, MFA
Health and Human Performance, MS (Applied Exercise Science; Athletic Training; Health Promotions; Physical Education)
Health Care Administration, MS (Administration; Leadership and Entrepreneurship)
History, MA
must hold an OSU faculty appointment and have familiarity with the academic requirements of the degree sought. To view the roles and responsibilities associated with members of advisory committees, go to http://gradcollege.okstate.edu/best-practice.

19.6 Level of Courses Applied to Graduate Degree. Graduate students must complete no fewer than 21 semester credit hours of 5000- and 6000-level courses through OSU as presented on the Plan of Study to meet requirements for the master's degree.

19.7 Plan of Study. The Plan of Study for the degree must be submitted online to the Graduate College prior to completion of the second semester of enrollment for a master's program. The student should develop the Plan of Study with the advisor using the online Plan of Study application (http://planofstudy.okstate.edu). The online submission request requires approval by the advisory committee and the student's graduate program with final approval by the Graduate College. The Plan of Study is subject to modification. All changes must have the approval of the advisor and the student's graduate program, and a final Plan of Study incorporating all changes should be submitted to the Graduate College by the posted deadline.

Graduate credit, up to a maximum of nine hours, used to obtain one master's degree may, with the approval of the advisory committee, be counted toward completion of another master's degree.

19.8 Major Subject or Field. A major field of study may cross graduate program lines with approval of the graduate program and dean of the Graduate College. To receive a master's degree, the student must have completed in the major field of study a minimum of 16 semester credit hours above the prerequisites required for graduate work in that subject or field.

19.9 Language Requirements. A candidate for a master's degree may be required to demonstrate a reading knowledge of a modern foreign language. Any such requirement of the graduate program included on the Plan of Study and noted at the time the preliminary plan is approved by the student's advisor. A foreign language requirement for a master's degree may be met either by examination or by college credit, according to individual graduate program requirement.

19.10 Written Examinations. Some graduate programs 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 graduate program at least three weeks in advance. The written examination must be passed before a final examination is scheduled, if a thesis or report option is used. A student who fails all or part of the written examination should consult the chair of the examination committee to find out what must be done before taking another examination.

19.11 Thesis. Any student working on a thesis should obtain a copy of the Graduate College Thesis/Dissertation Handbook available from the Graduate College at http://gradcollege.okstate.edu/tdg. A thesis must conform to the format specifications set forth in this document. The style of the document is to be determined by the advisory committee and should be reflective of publications in the student's discipline. Any graduate student writing a thesis must attend a format workshop prior to submission of their final copy. The dates for the workshops are on the Graduate Calendar and a webinar version is available. It is strongly recommended that a graduate student submit complete copies of his or her thesis to the committee members at least two weeks prior to the defense date, that the defense presentation be publicized, and that the thesis defense occur on a date during the normal academic semesters and sessions. Graduate programs may have additional or more restrictive requirements for thesis defenses. The student should submit an electronic copy of the final thesis through the OSU electronic submission website. Directions for the website submission are given to the student when he or she submits the Oral Defense Results Form. In addition, the student must submit to the Graduate College one paper copy of the approval page with all original signatures and the student's name and eight digit CWID number entered at the top of the page. Both the electronic submission and paper approval page must be received no later than the stated final submission deadline date (see the Calendar at the front of the "Graduate College" chapter of the Catalog for dates).

19.12 Report. The student must submit to the Graduate College the Formal Report Approval form.

19.13 Final Examination. If the thesis or report option is used, the student should arrange with the graduate program for the final examination and to distribute a copy as described in the preceding section. The final examination may be oral or written or both. 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 advisory committee. Another examination cannot be given for at least two months after a failure, and a graduate program may limit the number of times that the examination may be repeated.
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 by the semester deadline. Please see the Graduate College’s Best Practices: Advisory Committees and Defense of Dissertation for additional guidance (https://gradcollege.okstate.edu/best-practices).

20.0 SPECIALIST IN EDUCATION (EdS) DEGREE PROGRAM

The Specialist in Education degree in School Psychology is conferred as an appropriate recognition of achievement as evidenced by the following:

1. Successful professional performance in the area of the student's specialization.
2. Satisfactory completion of a program of graduate study of approximately two academic years.
3. Satisfactory performance on examinations designed to reveal the student’s understanding of the field of specialization and its relation to other areas.
4. Preparation of a thesis dealing with some aspect of concern to the student’s profession and its defense before a committee of the Graduate Faculty.

20.1 Temporary Adviser. At the beginning of a student’s Specialist in Education program, the school head 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.

20.2 Advisory Committee. Upon recommendation of the school head or the graduate committee of the school, an advisory committee of no fewer than three voting members will be appointed by the dean of the Graduate College at least one member of the advisory committee must be a school or department outside the student’s major field of study. 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 leading to the dissertation, and (5) arranges for and conducts the final examination. The chair of the committee need not necessarily serve as the student’s research adviser, but must hold an OSU faculty appointment and have familiarity with the academic requirements of the degree sought. To view the roles and responsibilities associated with members of advisory committees, go to http://gradcollege.okstate.edu/faculty-and-staff-resources.

20.3 Plan of Study. The original Plan of Study for the degree must be submitted to the Graduate College prior to the end of the second semester (excluding summer sessions) of enrollment for a specialist in education program. The student should develop the Plan of Study with the advisor using the online Plan of Study application (planofstudy.okstate.edu). The online submission requires approval by the advisory committee and the student’s graduate program with final approval by the Graduate College.

The Plan of Study may be modified with the approval of the adviser. A final Plan of Study incorporating all changes should be filed in the Graduate College by the eighth week of the semester in which the degree is to be conferred.

20.4 Credit hour Requirements. A minimum of 60 credit hours beyond the bachelor's degree and 33 credit hours beyond the master's degree are required for the Specialist in Education degree. This may include as many as 10 credit hours for the practicum study and accompanying report.

20.5 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) conduct an appropriate study of education, (3) show qualities of professional leadership and (4) pass a final examination.

20.6 Residence Requirements. While the Graduate College does not have a specific residence requirement that applies to all graduate programs, programs may require a period of time in residence for students enrolled in departmental graduate programs. Programs must inform students of any residence requirements upon their admission to departmental graduate programs. No more than nine hours of coursework transferred from another university may be used in fulfillment of the degree.

20.7 Qualifying Examination. A qualifying examination is required of all candidates for the Specialist in Education degree. The nature of this exam is determined within each specialization.

20.8 Credit Toward an EdD or a PhD. A student holding an EdS may have the credit hour requirements for a PhD or EdD reduced to 30 hours subject to recommendation by the advisory committee and approval of the dean of the Graduate College. However, all of the remaining 30 hours toward the doctoral degree must be taken at the 5000 or 6000 level and all must be taken at OSU.

21.0 DOCTOR OF EDUCATION (EdD) DEGREE PROGRAMS

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. The following EdD degrees are offered:

- Applied Educational Studies (Aviation and Space Education; College Interdisciplinary)
- Higher Education
- School Administration

21.1 Basic Requirements. The Doctor of Education degree requires a minimum of 90 semester credit hours beyond the bachelor's degree, or a minimum of 60 semester credit hours beyond the master's degree in a related discipline. Courses at the 5000 and 6000 level should make up at least 75 percent of the Plan of Study and must include ten hours, with a grade of "S," for the doctoral dissertation. 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.

A student who holds a DVM, MD, DO, DDS, LLB, JD, or equivalent professional degree may also have the minimum credit hour requirement reduced to 60 hours, subject to the recommendation of their advisory committee and the approval of the dean of the Graduate College. A student may receive only one 30-hour credit reduction in the EdD requirement regardless of the number of master’s or professional degrees that he or she holds.

21.2 Temporary Adviser. At the beginning of a student's doctoral program, the school head 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.

21.3 Advisory Committee. Upon recommendation of the head of the graduate program and approval of the graduate dean, an advisory committee of no fewer than four voting members will be appointed. The duties of the advisory committee consist of (1) advising the student, (2) assisting the student in preparing a Plan of Study, (3) assisting in planning and conducting the research, (4) supervising the writing of the dissertation, and (5) conducting the dissertation defense.

The chair of the committee need not necessarily serve as the student’s research adviser, but must hold an OSU faculty appointment and have familiarity with the academic requirements of the degree sought. Each doctoral committee must have at least one member of the Graduate Faculty from outside the student’s major department. To view the roles and responsibilities associated with members of advisory committees, go to http://gradcollege.okstate.edu/best-practices.

The student should consult the members of the advisory committee frequently and keep them informed on the progress of his or her work.

21.4 Preliminary Conference. As soon as the student is notified that an advisory committee has been appointed, the student should arrange with the chair 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.

21.5 Plan of Study. The student should develop the Plan of Study with the advisor and committee using the online Plan of Study application (http://planofstudy.okstate.edu/). The online submission requires approval by the advisory committee and the student’s graduate program with final approval by the Graduate College.

Because the acceptance of work that 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 original Plan of Study must be submitted to the Graduate College prior to the end of the third semester (excluding summer sessions) of enrollment in the doctoral program. 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 (1) at least 75 percent of courses taken at the 5000-6000 level, (2) a minimum of 60 hours beyond the master’s degree or 30 hours beyond the EdD and (3) at least 10 hours of dissertation credit. Courses from a master's degree or EdS are not listed on the doctoral Plan of Study.

Credit for all courses on a graduate Plan of Study must have been awarded within 10 years of completion of all degree requirements.

Changes in the Plan of Study can be made with the approval of the advisory committee and the dean of the Graduate College. If, however, any changes are not approved, the student must complete the changes within one year of graduation or the Plan of Study will be considered invalid. The original Plan of Study must be submitted to the Graduate College prior to the end of the third semester (excluding summer sessions) of enrollment in the doctoral program.

21.6 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 defense of dissertation and (5) comply with any other requirements of the major department.
A minimum of 30 credit hours must be taken at OSU. While the Graduate College does not have a specific residence requirement that applies to all graduate programs, departments may require a period of time in residence for students enrolled in departmental graduate programs. Programs must inform students of any residence requirements upon their admission to graduate programs.

21.8 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.

21.9 Admission to Doctoral Candidacy. Admission to doctoral candidacy marks the transition into the research phase of a doctoral degree and indicates agreement that the student has demonstrated the ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. Consideration for candidacy requires the presentation of a written research proposal for doctoral research to the doctoral advisory committee, who will assess the proposal and offer the student pertinent counsel, advice and feedback. The approval of the research proposal by the advisory committee is the basic requirement for admission to doctoral candidacy; individual programs will normally impose additional requirements, such as the successful completion of oral and/or written comprehensive or qualifying examinations. These additional requirements may occur in conjunction with the presentation of the research proposal, or they may occur at different times within the course of doctoral study. Admission to doctoral candidacy is conferred with the approval of the dean of the Graduate College, on behalf of the Graduate Council, acting upon the recommendation of program faculty. It is the responsibility of the chair of the advisory committee to notify the Graduate College when admission to candidacy is granted by submitting the Admission to Doctoral Candidacy form.

21.10 Dissertation Hours Taken as a Doctoral Candidate. Admission to candidacy must occur at least six months prior to the date of the final dissertation defense. Since admission to candidacy may occur at various times related to the academic calendar, the student will need to be admitted to candidacy early in the fall semester to be eligible to schedule their final dissertation defense and graduate in the spring; very early in the spring semester for summer graduation; and extremely early in the summer session for fall graduation. (See the Graduate College Calendar for term-specific dates.) If a student is admitted to candidacy prior to the first day of a given term, all dissertation hours taken that term and following may be included in the hours of dissertation research required as a doctoral candidate.

21.11 Dissertation. A dissertation 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 PhD. The EdD candidate should refer to the "Doctor of Philosophy" section in the Graduate College chapter of the Catalog on dissertations and submission procedures through the Graduate College. The style of the document is to be determined by the advisory committee and should be reflective of publications in the student's discipline. Any graduate student is writing a thesis must attend a format workshop prior to submission of their final copy. The dates for the workshops are on the Graduate Calendar and a webinar version is available.

22.0 DOCTOR OF PHILOSOPHY (PhD) DEGREE PROGRAMS

The Doctor of Philosophy (PhD) degree is granted in recognition of high achievement in scholarship and independent investigation. The student 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.

22.1 Current Degree Inventory

- Agricultural Economics
- Agricultural Education
- Animal Science
- Biochemistry and Molecular Biology
- Biomedical Sciences
- Biosystems and Agricultural Engineering
- Business Administration (Accounting; Entrepreneurship; Executive Research; Finance; Management; Management Science and Information Systems; Marketing)
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science
- Crop Science
- Economics
- Education (Curriculum Studies; Educational Technology; Professional Education Studies; Social Foundations of Education, Workforce and Adult Education)
- Educational Leadership and Policy Studies (Educational Administration; Higher Education)
- Educational Psychology (Counseling Psychology; Educational Psychology; Research and Evaluation; School Psychology)
- Electrical Engineering
- English
- Entomology
- Environmental Science
- Fire and Emergency Management Administration
- Food Sciences
- Geography
- Geology
- Health, Leisure and Human Performance (Health and Human Performance; Leisure Studies)
- History
- Human Sciences (Design, Housing and Merchandising; Hospitality Administration; Human Development and Family Science)
- Industrial Engineering and Management
- Integrative Biology
- Materials Science and Engineering
- Mathematics
- Mechanical and Aerospace Engineering (Unmanned Aerial Systems)
- Microbiology, Cell and Molecular Biology
- Natural Resource Ecology and Management (Fisheries and Aquatic Ecology; Forest Resources; Rangeland Ecology and Management; Wildlife Ecology and Management)
- Nutrition
- Photonics
- Physics
- Plant Pathology
- Plant Science
- Psychology (Clinical; Experimental)
- Sociology
- Soil Science
- Statistics
- Veterinary Biomedical Sciences

22.2 Basic Requirements. The Doctor of Philosophy degree requires the number of credit hours as specified by the degree program with a minimum of 60 credit hours beyond the bachelor's degree. These hours must include a minimum of 15 dissertation hours (6000) with a grade of "SR". The maximum number of dissertation hours (6000 with a grade of "SR") permissible on a Plan of Study must not exceed three-fourths of the total credit hours in the approved graduate degree program.

22.3 Temporary Adviser. At the beginning of a student's doctoral program, the graduate program will designate a member of the Graduate Faculty to serve as temporary adviser to the student. The temporary adviser will assist the student in the early selection of courses. Often, it is the graduate coordinator who serves as the temporary adviser.

22.4 Advisory Committee. Upon recommendation of the graduate program and approval of the dean of the Graduate College, an advisory committee of not fewer than four voting members will be appointed. The duties of the advisory committee consist of the following: advising the student in preparing a Plan of Study; assisting in planning and conducting the research; supervising the writing of the dissertation; and conducting the dissertation defense.

The chair of the committee need not necessarily serve as the student's research adviser, but must hold an OSU faculty appointment, be a member of the Graduate Faculty with doctoral chairing privileges, and have familiarity with the academic requirements of the degree sought. Each doctoral committee must have at least one member of the Graduate Faculty from outside the student's major department. To view the roles and responsibilities associated with members of advisory committees, go to http://gradcollege.okstate.edu/best-practices.

The student should consult the members of the advisory committee frequently and keep them informed on the progress of his or her work.

22.5 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.
22.6 Plan of Study. The student should develop the Plan of Study with the advisor and committee using the online Plan of Study application (http://planofstudy.okstate.edu/). The online submission requires approval by the advisory committee and the student’s graduate program with final approval by the Graduate College. The original Plan of Study must be submitted to the Graduate College prior to the end of the third semester (excluding summer sessions) of enrollment in the doctoral program. 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 of Study must include all the acceptable graduate work that has been completed and all that will be taken for the doctoral degree. The Plan of Study should include (1) at least 75 percent of courses taken at the 5000-6999 level, (2) a minimum of 60 hours beyond the master’s degree, and (3) a minimum of 15 (maximum of 45) dissertation hours (6000) with a grade of “SR” for the 60 hour doctorate or a minimum of 15 (maximum of 60) dissertation hours (6000) for the 90 hour doctorate. Courses used to earn a master’s degree are not listed on the doctoral Plan of Study.

Credit for all courses on a graduate Plan of Study must have been awarded within 10 years of completion of all degree requirements.

Changes in the Plan of Study 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 by the eighth week of the semester in which the degree is to be conferred.

22.7 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 defense of dissertation, and (5) comply with any other requirements of the major department.

22.8 Residence Requirements. A minimum of 30 credit hours must be taken at OSU. While the Graduate College does not have a specific residence requirement that applies to all graduate programs, graduate programs may require a period of time in residence for students enrolled in departmental graduate programs. Programs must inform students of any residence requirements upon their admission to their graduate programs.

22.9 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 graduate 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.

22.10 Admission to Doctoral Candidacy. Admission to doctoral candidacy marks the transition into the research phase of a doctoral degree and indicates agreement that the student has demonstrated the ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. Consideration for candidacy requires the presentation of a written research proposal for doctoral research to the doctoral advisory committee, who will assess the proposal and offer the student pertinent counsel, advice and feedback. The approval of the research proposal by the advisory committee is the basic requirement for admission to doctoral candidacy; individual programs will normally impose additional requirements, such as the successful completion of oral and/or written comprehensive or qualifying examinations. These additional requirements may occur in conjunction with the presentation of the research proposal, or they may occur at different times within the course of doctoral study. Admission to doctoral candidacy is conferred with the approval of the dean of the Graduate College, on behalf of the Graduate Council, acting upon the recommendation of program faculty. It is the responsibility of the chair of the advisory committee to notify the Graduate College when admission to candidacy is granted by submitting the Admission to Doctoral Candidacy form.

22.11 Dissertation Hours Taken as a Doctoral Candidate. Admission to candidacy must occur at least six months prior to the date of the final dissertation defense. Since admission to candidacy may occur at various times related to the academic calendar, the student will need to be admitted to candidacy early in fall semester to be eligible to schedule their final dissertation defense and graduate in the spring; very early in the spring semester for summer graduation; and extremely early in the summer session for fall graduation. (See the Graduate College Calendar for term-specific dates.)

22.12 Dissertation. A dissertation (doctoral thesis) is required of each doctoral candidate. The subject of the dissertation must be approved by the advisory committee and the dissertation is prepared under the direction of members of the committee or a special dissertation committee approved by the advisory committee chair. The dissertation must follow specifications in the Graduate College Thesis/Dissertation Guidelines, available at http://gradcollege.okstate.edu/tdg. The style of the document is to be determined by the advisory committee and should be reflective of publications in the student’s discipline. Any graduate student is writing a thesis must attend a format workshop prior to submission of their final copy. The dates for the workshops are on the Graduate Calendar and a webinar version is available.

All dissertation copies must have the necessary approval signatures before submission to the Graduate College.

It is strongly recommended that a graduate student submit complete copies of his or her dissertation to the committee members at least two weeks prior to the defense date, that the defense presentation be publicized, and that the dissertation defense occur on a date during the normal academic semesters and sessions. Graduate programs may have additional or more restrictive requirements for dissertation defenses.

The student should submit an electronic copy of the dissertation through the OSU electronic submission website. Instructions for on-line submission are given to the student after completion of the National Survey of Earned Doctorates. In addition, the student must submit to the Graduate College one paper copy of the approval page with all original signatures and the student’s name and CWID number entered at the top of the page. Both the electronic submission and paper approval page must be received no later than the stated final copy submission deadline date (see the Calendar at the front of the “Graduate College” chapter for dates).

22.13 Final Examination. The student should arrange with the graduate program for the final examination and to distribute a copy of the dissertation as described in the preceding section. The final examination is primarily a defense of the dissertation. If the defense is judged inadequate, a decision on whether to permit re-examination will be made by the advisory committee. Another examination cannot be given for at least two months after a failure, and a graduate program may limit the number of times that the examination may be repeated.

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 dissertation as required by the committee and by the Graduate College and submit it in final form signed by the committee to the Graduate College by the semester deadline.

Please see the Graduate College’s Best Practices: Advisory Committees and Defenses document for additional guidance (https://gradcollege.okstate.edu/best-practices).
### Summary of Procedure for Master’s Degree

*denotes form available at [http://gradcollege.okstate.edu/forms](http://gradcollege.okstate.edu/forms)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Time</th>
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<tbody>
<tr>
<td>1. Apply for admission to a graduate degree program.</td>
<td>Complete 30 days prior to enrollment or graduate program deadline.</td>
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<td></td>
<td>(International students see section on International Admission for deadlines.)</td>
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<tr>
<td>2. Secure assignment of a temporary adviser from the graduate program and</td>
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<tr>
<td>enroll.</td>
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<tr>
<td>3. Complete Responsible Conduct of Research (RCR) Requirements and report</td>
<td>Prior to submission of Plan of Study.</td>
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<td>completion to graduate program office.</td>
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<td>4. Form advisory committee.</td>
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<td>5. Submit an online <strong>Plan of Study</strong> with the assistance of advisory</td>
<td>See calendar for deadlines.</td>
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<td>committee.</td>
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<td>6. Plan thesis/report research with research adviser and advisory</td>
<td>As early in the research phase as possible.</td>
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<td>committee (if applicable).</td>
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<tr>
<td>7. Complete major portion of course work and graduate/program requirements</td>
<td>See graduate/program guidelines.</td>
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<td>(e.g., exams).</td>
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<tr>
<td>8. Verify accuracy of Plan of Study and submit a revised plan if necessary</td>
<td>See Calendar for deadlines</td>
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<tr>
<td>Secure adviser and graduate program approval for any necessary changes.</td>
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<tr>
<td>9. Complete <strong>Graduation Clearance Form</strong> (Graduate College) and <strong>Diploma</strong></td>
<td>See Calendar for deadlines.</td>
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<tr>
<td><strong>Application</strong> (Registrar). Follow guidelines given on the Graduation</td>
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<tr>
<td>Clearance Form carefully.</td>
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<tr>
<td>10. Thesis students: Attend a workshop or watch online tutorial.</td>
<td>See Calendar for deadlines.</td>
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<tr>
<td>11. Schedule the thesis/report defense. (if applicable)</td>
<td>See Calendar for deadlines, see “Thesis” section of the Catalog for</td>
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<td>recommendations on timing, and see graduate program guidelines for specific requirements.</td>
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<tr>
<td>12. Submit a copy of the thesis/report to each committee member to review</td>
<td>At least two weeks prior to the defense of the thesis.</td>
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<td>(if applicable). The format must follow the uniform standards in the Thesis/</td>
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<td>Dissertation Guidelines; however, the style is to be determined by the</td>
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<td>advisory committee.</td>
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<tr>
<td>13. Defend the thesis (if applicable). The student or committee chair</td>
<td>See Calendar for deadlines.</td>
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<tr>
<td>should notify the Graduate College of the results by submitting the <strong>Thesis/Dissertation Oral Defense Results</strong> form immediately following conclusion of the examination.</td>
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<tr>
<td>14. Make any changes in thesis required by advisory committee. Submit</td>
<td>See Calendar for deadlines.</td>
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<tr>
<td>signed approval page to the Graduate College. The Graduate College makes</td>
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<tr>
<td>the final decision on acceptance of the thesis. Submit the electronic thesis</td>
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<td>online.</td>
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<tr>
<td>15. Rent or buy cap, gown, and hood at Student Union Bookstore and attend</td>
<td>See Calendar for date of Graduate Commencement.</td>
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<tr>
<td>Graduate Commencement.</td>
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</tbody>
</table>
**Summary of Procedure for Doctoral Degree**
*denotes form available at [http://gradcollege.okstate.edu/forms](http://gradcollege.okstate.edu/forms)

<table>
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</tr>
<tr>
<td>2. Secure assignment of a temporary adviser from graduate program and enroll.</td>
<td></td>
</tr>
<tr>
<td>3. Complete Responsible Conduct of Research (RCR) Requirements and report completion to graduate program office.</td>
<td>Prior to submission of Plan of Study.</td>
</tr>
<tr>
<td>4. Form advisory committee.</td>
<td></td>
</tr>
<tr>
<td>5. Prepare Plan of Study* with the assistance of advisory committee.</td>
<td>Prior to the end of the third semester (excluding summer sessions) of enrollment.</td>
</tr>
<tr>
<td>6. Plan dissertation research with research adviser and advisory committee.</td>
<td>As early in the research phase as possible.</td>
</tr>
<tr>
<td>7. Complete major portion of course work and the graduate program requirements (e.g., exams).</td>
<td>See graduate program guidelines.</td>
</tr>
<tr>
<td>8. Have research protocol approved by advisory committee and submit Admission to Doctoral Candidacy Form* to the Graduate College.</td>
<td>See &quot;Admission to Doctoral Candidacy&quot; section of the Catalog for details.</td>
</tr>
<tr>
<td>9. Verify accuracy of Plan of Study and submit a revised plan if necessary.</td>
<td>See Calendar for deadlines.</td>
</tr>
<tr>
<td>10. Complete Graduation Clearance Form* (Graduate College) and Diploma Application (Registrar). Follow guidelines given on the Graduation Clearance Form carefully.</td>
<td>See Calendar for deadlines.</td>
</tr>
<tr>
<td>11. Attend a format workshop or watch online tutorial.</td>
<td>See Calendar for deadlines.</td>
</tr>
<tr>
<td>12. Schedule dissertation defense.</td>
<td>See Calendar for deadlines, see &quot;Dissertation&quot; section of the Catalog for recommendations on timing, and see graduate program guidelines for specific requirements.</td>
</tr>
<tr>
<td>13. Submit a copy of the dissertation to each committee member to review.</td>
<td>At least two weeks prior to the defense of the dissertation.</td>
</tr>
<tr>
<td>14. Defend the dissertation. The student or committee chair should notify the Graduate College of the results by submitting the Thesis/Dissertation Oral Defense Results form immediately following conclusion of the examination.</td>
<td>See Calendar for deadlines.</td>
</tr>
<tr>
<td>15. Make any changes in dissertation required by advisory committee. Submit signed approval page to the Graduate College. The Graduate College makes the final decision on acceptance of the dissertation. Complete the National Survey of Earned Doctorates. Submit the electronic dissertation online.</td>
<td>See Calendar for deadlines.</td>
</tr>
<tr>
<td>16. Rent or buy cap, gown, and hood at Student Union Bookstore and attend Graduate Commencement.</td>
<td>See Calendar for date of Graduate Commencement.</td>
</tr>
</tbody>
</table>
Graduate Faculty

The OSU Graduate Faculty are listed in two sections: Members and Members Emeriti. Degrees held and degree granting institutions are listed for each member. Dates following indicate the year that the faculty member was initially appointed to a position at Oklahoma State University.

Members

Abdel Salam, Mohamed—BS (Univ. of Khartoum, Sudan), MS (ibid.), PhD (Univ. of Texas at Dallas); Professor of Geology. 2012.

Abdohann, Reza—BS (Sharif Univ of Technology Iran), MS (ibid.), PhD (Georgia Institute of Technology); Assistant Professor of Electrical and Computer Engineering. 2008.

Abi, Sergio Manaco—BS (Vinasas State Univ.), MS (North Carolina State Univ.), PhD (ibid.); Assistant Professor of Plant and Soil Sciences. 2012.

Abraham, Eric R.—BA (St. Olaf College), MS (Rice Univ.), PhD (ibid.); Adjunct Professor of Physics. 2014.

Abramson, Charles Ira—BA (Boston Univ), MA (ibid), PhD (ibid); Regents Professor of Psychology. 1993.

Acken, John Michael—BS (Oklahoma State Univ), MS (ibid.), PhD (Stanford Univ); Assistant Professor of Electrical and Computer Engineering. 2001.

Ackerson, Bruce—BS (Univ of Nebraska), MS (Univ of Colorado), PhD (ibid.); Professor of Physics. 1977.

Adam, Brian D.—BS (Wheaton College), MS (Univ of Nebraska, Lincoln), PhD (Univ of Illinois); Professor of Agricultural Economics.1990.

Adams, Brant—BM (Capital Univ.), MM (Univ of Cincinnati College of Music), PhD (Univ of Texas at Austin); Professor of Music. 1996.

Adams, Henry David—BA (Alfred Univ), MS (Northern Arizona Univ.), PhD (Univ of Arizona); Assistant Professor of Botany. 2015.

Adkins, Lee C.—BS (Florida State Univ), MA (Louisiana State Univ), PhD (ibid); Assistant Professor of Economics. 1988.

Addikson, Danny M.—BA (Oklahoma State Univ), MA (ibid), EdD (ibid); Associate Professor of Political Science. 1976.

Agarell, Girish Saron—BS (Univ of Garghpur), MS (Banaras Hindu Univ), PhD (Univ of Rochester); Regents Professor of Physics. 2004.

Agnew, Robert—BS (Oklahoma State University), MS (University of Oklahoma), Assistant Professor of Engineering Technology Division. 2014.

Ahmad, Ibrahim Aba—BS (Cairo Univ), MS (Florida State Univ), PhD (ibid.); Regents Professor of Statistics. 2009

Ahmad, Salahuddin—BSc (Dhaka Univ, Bangladesh), MSC (ibid), PhD (Univ of Victoria, BC, Canada); Adjunct Associate Professor of Physics. 2008.

Ahmed, Mohamed Samir—BS (Cairo Univ), MS (Ain-Shams Univ), MS (McGill Univ), PhD (Univ of Oklahoma); Professor of Civil and Environmental Engineering. 1980.

Aichele, Clint Philip—BS (Oklahoma State Univ), PhD (Rice Univ.); Assistant Professor of Chemical Engineering. 2012.

Aime, Federico—BS (Univ of Catolica, Argentina), MBA (Univ of North Carolina), PhD (Michigan State Univ); Assistant Professor of Management. 2006.

Akkerman, Jill—BS (North Carolina State Univ) DVM (ibid.), PhD (ibid.); Associate Professor of VBS: Physiological Sciences. 2015.

Alkeshrood, Mark S.—BS (Univ of Utah), PhD (ibid.); Adjunct Associate Professor of Physics. 2008.

Alder, Brian—BA (Univ of Colorado), MS (ibid.), PhD (ibid.); Assistant Professor of Plant and Soi Sciences. 2015.

Alderson, Robert Matthew—BA (Auburn Univ), MS (Univ of South Alabama), PhD (Univ of Central Florida); Assistant Professor of Psychology. 2009.

Allday, Richard Allan—BA (Auburn Univ), MED (ibid), PhD (ibid); Assistant Professor of Teaching and Curriculum Leadership. 2007.

Allen, Kevin P.—BS (Southwest Missouri State Univ), MS (Oklahoma State Univ), PhD (ibid); Assistant Professor of Natural Resource Ecology and Management. 2006.

Allen, Randy D.—BS (Southwestern Adventist College), MA (Univ of Texas at Arlington), PhD (Texas A&M Univ); Professor of Biochemistry and Molecular Biology. 2009.

Allen, Robert W.—BS (Univ of Tulsa), PhD (Purdue Univ); Professor of CHS: Forensic Sciences. 2001.

Allison, Robin W.—AAS (Columbus Technical Institute), DVM (Colorado State Univ), PhD (ibid.); Associate Professor of VHS: Pathobiology. 2004.

Alsach, Dale E.—BS (Univ of Akron), PhD (Ohio State Univ); Professor of Mathematics. 1979.

Alvarez-Sancho, Isabel—PhD (Michigan State Univ); Assistant Professor of Foreign Languages and Literature. 2015.

Amiri, Ali—BS (HIEC, Tunisia), MBA (Ohio State Univ), PhD (ibid); Associate Professor of Management Science and Information Systems. 1998.

Ammerman, Loren K.—BS (Texas A&M Univ); PhD (The Unv of Texas at Austin); Department of Zoology. 2010.

Amos, Gray M.—BA (Wichita State Univ), MS (Iowa State Univ), PhD (ibid); Professor of Economics. 1979.

Anderson, Jeffrey—BA (Rutgers Univ), PhD (Univ of Florida); Professor of Horticulture and Landscape Architecture. 1986.

Anderson, Michael P.—BS (Brigham Young Univ), MS (Univ of Minnesota), PhD (ibid); Associate Professor of Plant and Soil Sciences. 1990.

Anella, Louis—BA (Vassar College), MS (Cornell Univ), PhD (ibid); Associate Professor of Horticulture and Landscape Architecture. 1997.

Angle, Julie Marie—BS (Oklahoma State Univ), MEd (Northwestern Oklahoma State Univ), PhD (Oklahoma State Univ); Assistant Professor of Teaching and Curriculum Leadership. 2010.

Aryal, Robert J.—BS (Hastings College), MS (Utah State Univ), PhD (Univ of Wyoming); Professor of Natural Resource Ecology and Management. 2016.

Antonenko, Pavlo (Pasha) D.—BS (Nizhyn State Pedagogical Univ), MEd (ibid), PhD (Iowa State Univ); Assistant Professor of Educational Studies. 2007.

Appelt, Allen W.—BS (Univ of New Brunswick), PhD (Univ of Calgary); Professor of Chemistry. 1997.

Applegate, Michael—BA (Brigham Young Univ), PhD (Iowa State Univ); Professor of Economics. 1974.

Arata, Laura—BA (Univ of Washington), MA (Washington State Univ), PhD (ibid.); Assistant Professor of History. 2014.

Arena, Andrew S.—BS (Univ of Arizona), MS (Univ of Notre Dame), PhD (ibid); Professor of Mechanical and Aerospace Engineering. 1993.

Arens, Zachary Glenn—BBA (James Madison Univ), MS (Univ of Maryland), PhD (ibid.); Assistant Professor of Marketing. 2014.

Armstrong, Collette M.—BS (Middle Tennessee State Univ), MS (Kansas State Univ), PhD (ibid); Assistant Professor of Design, Housing and Merchandising. 2016.

Arnold, Todd J.—BBA (Univ of Texas), MS (Univ of Wyoming), PhD (Univ of Missouri); Associate Professor of Marketing. 2006.

Arrese, Estela Laura—BS (National Univ of La Plata, Argentina), PhD (ibid); Research Associate Professor of Biochemistry and Molecular Biology. 2008.

Asgari, Madhi—BS (Sharif Univ of Tech), PhD (Purdue Univ), PhD (ibid); Associate Professor of Mathematics. 2008.

Ato, Tutalem—BA (Duquequesne Univ), MA (ibid), MS (ibid), PhD (Cabrini College), PhD (Penn State Univ); Assistant Professor of Educational Studies. 2015.

Atekwana, Eliot Anong—BS (Univ of Maryland), MS (Howard Univ), PhD (Western Michigan Univ); Associate Professor of Geology. 2006.

Atekwana, Estella Akweseh—BS (Howard Univ), MS (ibid), PhD (ibid); Regents Professor of Geology. 2006.

Atiles, Jorge H.—BArch (Universidad Nacional Pedem hreniguez Urena), MUP (Virginia Polytechnic Institute and State Univ), PhD (ibid); Professor of Design, Housing and Merchandising. 2010.

Atriyeh, Hasan—BS (Jordan Univ of Science & Tech), MS (ibid), PhD (Univ of Ottawa); Associate Professor of Biosystems and Agricultural Engineering. 2009.

Aulker, Kaye Strom—BS (Oklahoma State Univ), MS (Univ of Oklahoma), PhD (ibid); Assistant Professor of Communication Sciences and Disorders. 2010.

Ausman, Kevin Douglas—BS (Univ of Nebraska), PhD (ibid); Assistant Professor of Psychology. 2015.

Austin, Linda Marilyn—BA (State Univ of New York at Stonybrook), MA (Univ of Rochester), MS (Univ of Illinois), PhD (Univ of Rochester); Professor of English. 1985.

Ayoubi Camaan, Patricia Jane—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Associate Professor of Biochemistry & Molecular Biology. 2005.
Azam, Mehtabul—BA (Univ. of Delhi, India), MA (Southern Methodist Univ.), MA (Delhi School of Economics, India), PhD (Southern Methodist Univ.); Assistant Professor of Economics. 2015.

Azizi, Seemi—BA (The Univ of Punjab, Pakistan), MFA (The Univ. of Punjab, Pakistan), MA (Univ of Arizona), PhD (Univ of Arizona); Assistant Professor of Teaching and Curriculum Leadership. 2010.

Babu, Kaladi S.—BSc (Univ of Mysore, India), MSc (Indian Inst of Technology, Bombay, India), PhD (Univ of Hawaii at Manoa); Regents Professor of Physics. 1998.

Bach, Christian—Assistant Professor of Mechanical and Aerospace Engineering. 2014.

Backus, Irene Bowen—BA (Kalama Zoo College, MA (Univ of Chicago), PhD (ibid.); Assistant Professor of Art. 2012.

Baghurst, Timothy M.—BSc (Univ of Chichester), MSc (Univ of Bangor), PhD (Univ of Arkansas); Assistant Professor of Applied Health and Educational Psychology. 2012.

Bai, Henry—PhD (Univ of Science and Technology of China), Ph.D. (Rensselaer Polytechnical Institute); Assistant Professor of Mechanical and Aerospace Engineering. 2015.

Bailey, Keith L.—BS (Arkansas State Univ), DVM (Univ of Missouri, Columbia), PhD (ibid.); Associate Professor of VBS: Pathobiology. 2011.

Bailey, Lucy E.—BA (Univ of Tennessee), MA (The Ohio State Univ), PhD (ibid.); Associate Professor of Educational Studies. 2005.

Bailey, Whitney Brosi—BS (Univ of Missouri, Northwest), MS (Univ of Arkansas), PhD (Univ of Texas at Austin); Associate Professor of Human Development & Family Science. 2004.

Baker, Marshall A.—BS (Univ of Florida), MS (ibid.), PhD (Oklahoma State Univ); Assistant Professor of Agricultural Education. 2013.

Baker, Sharon—BS (Oklahoma College of Liberal Arts), MED (Univ of Oklahoma), EdD (Oklahoma State Univ); Adjunct Professor of Human Development & Family Science. 2013.

Balasundaram, Balabhaskar—B.Tech (Indian Institute of Technology), PhD (Texas A&M Univ); Assistant Professor of Industrial Engineering and Management. 2007.

Ballard, Holly Noel Woodward—BA (North Carolina State College), MS (Texas Tech Univ), PhD (Montana State Univ); Assistant Professor of CHS: Anatomy and Cell Biology. 2013.

Bandy, Donna Kay—BA (Univ of Iowa), MA (Drexel Univ), PhD (ibid.); Professor of Physics. 1987.

Banik, Gouranga—PhD (Iowa State Univ); Professor of Engineering Technology. 2015.

Barker, Donna K.—BS (Univ of California, Los Angeles), PhD (Washington State Univ); Adjunct Professor of Engineering Technology. 2015.

Baraldi, Amanda—BA (Univ of Massachusetts), M.S. (Columbia Univ.), Ph.D. (Arizona State Univ); Assistant Professor of Psychology. 2015.

Barchini, Leticia I.—BA (Univ Nacional de Tucuman, Argentina), PhD (Univ Nacional de Tucuman, Argentina); Assistant Professor of Mathematics. 1997.

Barnes, Laura LB.—BA (Univ Nacional de Tucuman, Argentina), PhD (Univ Nacional de Cordoba, Argentina); Professor of Mathematics. 1997.

Barrett, David Clive—BS (Weber State Univ), MEd (Utah State Univ), EdD (Florida State Univ); Associate Professor of Applied Health and Educational Psychology. 2007.

Barker, Robert A.—BS (City Univ of New York), MA (Univ of Iowa), PhD (ibid.); Professor of Entrepreneurship and Emerging Enterprise. 2010.

Barrows, Joseph R.—BS (Siena College), MS (Virginia Tech), PhD (ibid.); Professor of Entrepreneurship and Emerging Enterprise. 2010.

Barringer, Bruce R.—BS (Iowa State Univ), M.B.A. (PhD (University of Missouri); Professor of Entrepreneurship and Emerging Enterprise. 2010.

Barrows, William W.—BS (Midwestern State Univ), MS (Univ of Houston), PhD (Colorado State Univ); Professor of VBS: Pathobiology. 2001.

Basu, Anuja—BS (Univ of Calcutta, India), PhD (ibid.), PhD (Texas Woman's Univ); Assistant Professor of Nutritional Sciences. 2006.

Basu, Raj—BA (Delhi Univ), MBA (Duke Univ), PhD (Purdue Univ); Associate Professor of Management. 1991.

Baughman, Todd Alan—BS (Oklahoma State Univ), MS (Univ of Texas at Austin); Adjunct Professor of Plant and Soil Sciences. 2013.

Baum, Kristen—BS (The College of William and Mary), MS (ibid.), PhD (Mississippi State Univ); Adjunct Professor of Plant and Soil Sciences. 2013.

Bays, Brand—BA (Oklahoma State Univ), MS (Univ of Tennessee), PhD (Univ of Nebraska); Associate Professor of Geography. 1999.

Beach, Maria Christine—BS (Vanderbilt Univ), MA (Villanova Univ), MEd (Vanderbilt Univ), PhD (Univ of Texas at Austin); Assistant Professor of Theatre. 2009.

Beamer, Jason—BS (Oklahoma State Univ), M.S. (Univ of Florida), DO (ibid.); Clinical Assistant Professor of CHS: Psychiatry and Behavioral Sciences. 2016.

Beasley, Lana Olivo—BS (Oklahoma State Univ), MA (Univ of Kansas), PhD (ibid.); Assistant Professor of Psychology. 2010.

Beasley, Lana—BS (Oklahoma State Univ), MA (Univ of Kansas), PhD (ibid.); Assistant Professor of Human Development & Family Science. 2015.

Beauchamp, Toby Cason—BA (Univ of Florida), PhD (Univ of California, Davis); Assistant Professor of English. 2012.

Beeby, Gary J.—BS (Phillips Univ), MA (Univ of Illinois); Assistant Professor of Communication Sciences and Disorders. 1974.

Beem, Marley Dale—BA (Claremont McKenna College), MAG (Auburn Univ.), PhD (Oklahoma State Univ); Adjunct Professor of Natural Resource Ecology and Management. 2013.

Beier, Richard A.—BS (Kansas State Univ), MS (ibid.), PhD (Univ of California); Professor of Engineering Technology Division. 2002.

Behrens, Jason R.—BS (Southwestern College), MS (Wichita State Univ), PhD (Iowa State Univ); Associate Professor of Zoology. 2007.

Bell, Gregory E.—BS (Ohio State Univ), MS (ibid.), PhD (ibid); Associate Professor of Horticulture and Landscape Architecture. 1997.

Bell, Kenneth John—BS (Case Inst of Technology), MChE (Univ of Delaware), PhD (ibid.); Regents Professor Emeritus of Chemical Engineering. 1961.

Bell, Stephen S.—BSEE (Univ of Wisconsin), MSE (ibid.), PhD (ibid.); Associate Professor of Electrical & Computer Engineering. 1988.

Beller, Caroline—BS (Florida Atlantic Univ), MEd (Texas A&M Univ), PhD (ibid.); Associate Professor of Teaching and Curriculum Leadership. 2003.

Bellmer, Danielle—BS (Michigan State Univ), PhD (Purdue Univ); Associate Professor of Biosystems and Agricultural Engineering. 1997.

Belmonte, Laura—AB (Univ of Georgia), MA (Univ of Virginia), PhD (ibid.); Assistant Professor of History. 1996.

Belter, Babette Diane—BMI (Univ of Wisconsin, Stevens Point), MM (Michigan State Univ); Associate Professor of Music. 1988.

Bement, Leland C.—BA (Fort Lewis College), MA (Univ of Texas), PhD (ibid.); Adjunct Professor of Plant and Soil Sciences. 2007.

Benjamin, Bruce A.—BS (Westminster College), PhD (Univ of Oklahoma); Associate Professor of CHS: Pharmacology and Physiology. 1997.

Bennett, Rebecca Susan—BS (Univ of Maryland, College Park), PhD (Cornell Univ); Adjunct Assistant Professor of Entomology & Plant Pathology. 2013.

Benson-Cain, Rebecca—BA (Univ of New Orleans), MA (Michigan State Univ), PhD (Univ of California, Santa Barbara); Assistant Professor of Philosophy. 2007.

Benton, Eric R.—BS (Univ of San Francisco), PhD (Univ College, Dublin); Associate Professor of Physics. 2006.

Bergey, Elizabeth A.—BS (Univ of Oklahoma), MS (Colorado State Univ), PhD (Univ of California, Berkeley); Department of Natural Resource Ecology and Management. 2011.

Berlin, Kenneth Darrell—BA (North Central College, Illinois), PhD (Univ of Illinois, Urbana); Regents Professor of Chemistry. 1960.

Bernardini, Jeremy—BA (Univ of Oklahoma), MFA. (ibid.); Assistant Professor of Theatre. 2015.

Betts, Nancy M.—BA (Pennsylvania State Univ), MS (The Ohio State Univ), PhD (ibid.); Professor of Nutritional Sciences. 2005.

Bidwell, Joseph R.—BS (Sienna College), MS (Virginia Technical Univ), PhD (ibid.); Associate Professor of Zoology. 2001.

Bidwell, Terrence G.—BS (Oklahoma State Univ), MS (ibid.), PhD (ibid); Professor of Natural Resource Ecology and Management. 1998.

Bierman, Jon T.—BS (Southern Ill), MS (Southern Illinois Univ), PhD (Oklahoma State Univ); Adjunct Assistant Professor of Agricultural Economics. 2010.

Bikkin, Prem—B.Tech(National Institute of Technology, Warangal), M.Tech. (Indian Institute of Technology, Gawahati), Ph.D (Univ of Tubia); Assistant Professor of Chemical Engineering. 2014.

Bilbiski, Mohammed U.—BArch (Oklahoma State Univ), MArch (ibid.); Professor of Architecture. 1999.

Bilbiski, Suzanne Denise—BArch (Oklahoma State Univ), MArch (ibid.); Professor of Architecture. 2013.

Billman, Jon Donald—BA (Iowa Wesleyan College), MFA (Eastern Washington Univ); Assistant Professor of English. 2007.

Bindeo, Benjamin J.—BA (Anderson Univ), MEd (Clemson Univ), PhD (ibid.); Assistant Professor of Educational Studies. 2007.

Binegar, Birne Thomas—BS (Univ of California, Los Angeles), MS (ibid.), PhD (ibid); Associate Professor of Mathematics. 1988.

Bird, Lee E.—BS (Univ of Arizona), MS (Univ of Wisconsin Superior), PhD (Univ of Arizona); Adjunct Professor of Educational Studies. 2000.

Bird, Sharon—BA (Univ of Oklahoma), M.S. (ibid.), PH.D. (Washington State Univ); Professor of Sociology. 2015.

Biron, David P.—BA (Flagler College), MA (The Troy State Univ), MS (Air Force...
Brooks, Ronald Clark—BS (Old Dominion Univ), MFA (ibid), PhD (Univ of Oklahoma); Associate Professor of Music. 2008.

Bromen, Barbara Jean—BS (Kansas State Univ), MS (ibid), PhD (Univ of Kansas); Assistant professor of Agricultural Economics. 1991.

Brown, Tom J.—BS (Old Dominion Univ), MBA (ibid), PhD (Univ of Wisconsin, Madison); Professor of Marketing. 1997.

Buckner, David Lee—BSE. (Univ of Arkansas), MED (ibid), PhD (ibid); Assistant Professor of Teaching and Curriculum Leadership. 2006.

Bukkapatnam, Satish T.—BTech (SV Univ India), MS (Pennsylvania State Univ), PhD (ibid); Professor of Industrial Engineering and Management. 2004.

Bulut, Rifat—BS (Middle East Technical Univ, Turkey), MS (Texas Tech Univ), PhD (Texas A&M Univ); Associate Professor of Civil and Environmental Engineering. 2006.

Bunce, Richard A.—BS (Marietta College), PhD (Univ of Wisconsin, Madison); Professor of Chemistry. 1983.

Bunting, Charles F.—BSEET (Old Dominion Univ), MSE (Virginia Techinal Univ), PhD (ibid); Professor of Electrical and Computer Engineering. 2001.

Burbank, David—BA (Southern Illinois Univ), BS (Auburn Univ); Professor of VBS: Veterinary Clinical Sciences. 2015.

Burch, Morgan—BA (George Mason Univ.), M.A. (San Diego State Univ.), Ph.D. (Univ. of Oregon); Assistant Professor of Philosophy. 2015.

Burkel, John D.—BS (Southern Illinois Univ), MBA (Indiana Univ), PhD (ibid); Clinical Assistant Professor of Management Science and Information Systems. 2010.

Burnap, Robert L.—BS (Univ of Michigan), MA (Univ of California, Los Angeles), PhD (Univ of California, Santa Barbara); Professor of Microbiology and Molecular Genetics. 1991.

Burnham, David—BS (Brigham Young Univ), MS (ibid), PhD (Univ of Texas Health Sciences Center); Associate Professor of Microbiology and Molecular Genetics. 1988.

Burrell, Anthony T.—BS (Univ of California-Santa Barbara), MS (West Coast Univ), PhD (Univ of Virginia); Associate Professor of Computer Science. 1999.

Buser, Michael Dean—AAS (Rogers State College), BS (Oklahoma State Univ), MS (ibid), PhD (Texas A&M Univ); Associate Professor of Biosystems and Agricultural Engineering. 2009.

Bylund, Per L.—B.Sc. (Jonkopings International Business School), M.S. (Jonkopings International Business School), M.A. (Lund Univ.), Ph.D. (Univ of Missouri); Assistant Professor of Entrepreneurship and Emerging Enterprise. 2015.

Byrd-Craven, Jennifer—BA (University of New Mexico), MS (University of Texas, Tyler), PhD (University of Missouri); Assistant Professor of Psychology. 2008.

Byrnes, Jeffrey Myer—BA (Case Western Reserve Univ), M.A. (Lund Univ.), Ph.D. (Univ of Missouri); Assistant Professor of Geology. 2007.

Cai, Tony—BS (Tianjin Univ China), MS (ibid), PhD (University of Delaware); School of Chemical Engineering. 2016.
Caldwell, Lloyd N.—BA (Univ. of Cincinnati); MFA (Virginia Commonwealth Univ); Associate Professor of Theatre. 2004.
Campbell, Polly—PhD (Boston Univ.); Assistant Professor of Zoology. 2013.
Caniglia, Beth Schaefer—BA (Univ of Nebraska, MA (Univ of Notre Dame), PhD (ibid); Associate Professor of Sociology. 2000.
Cantley, Penny L.—BS (University of Oklahoma), PhD (ibid); Visiting Assistant Professor of Teaching and Curriculum Leadership. 2011.
Caplov, Nancy Jill—BA (Colgate Univ), MA (Indiana Univ), PhD (Univ of California, Santa Barbara); Assistant Professor of English. 2011.
Cardwell, Kitty F.—BS (Univ of Texas), PhD (Texas A&M Univ); Professor of Entomology & Plant Pathology. 2016.
Carlozzi, Alfred—BA (Iona College), MA (Trinity Univ), EdD (Univ of Houston); Professor of Applied Health and Educational Psychology. 1979.
Carlozzi, Barbara Jane—BA (Michigan State University), MEd (Univ of Houston), PhD (Ohio State Univ); Associate Professor of Applied Health and Educational Psychology. 2001.
Carlson, John Douglas—BS (Michigan State Univ), MS (Univ of Wisconsin-Madison), PhD (The Ohio State Univ); Research Associate of Biosystems and Agricultural Engineering. 1991.
Carlson, Thomas A.—BA (Univ of Washington), BS (Univ of Washington), MA (Princeton Univ), MDiv (Trinity Evangelical Divinity School), MS (Oxford Univ), PhD (Princeton Univ); Assistant Professor of History. 2014.
Carpenter, Nancy J.—BA (Albion College), MS (Univ of Michigan), PhD (ibid); Adjunct Professor of CHS: Biochemistry and Microbiology. 1995.
Carroll, Pamela Siss—BA (Auburn Univ), BS (ibid), MS (Florida State Univ), EdD (ibid); Professor of Teaching and Curriculum Leadership. 2012.
Carroll, Stanley—BArch (Univ of Oklahoma), BS (Kansas State Univ), MArch (Architectural Association of London); Assistant Professor of Architecture. 2014.
Carter, Brian J.—BS (Rutgers Univ), MS (Pennsylvania State Univ), PhD (ibid); Professor of Plant and Soil Sciences. 1982.
Carter, David A.—BS (Brigham Young Univ), MBA (Utah State Univ), PhD (Univ of Georgia); Professor of Finance. 1998.
Carter, Scott D.—BS (Ohio State Univ), PhD (Univ of Kentucky); Associate Professor of Animal Science. 1996.
Carch, William Dwayne—BS (Ohio State Univ), MS (ibid), PhD (Univ of Missouri); Professor of Agricultural Education. 2001.
Carver, Brett F.—BS (Univ of Georgia), MS (North Carolina State Univ), PhD (ibid); Regents Professor of Plant and Soil Sciences. 1985.
Case, Kenneth E.—BSEE (Oklahoma State Univ), MSE (ibid), PhD (ibid); Regents Professor Emeritus of Industrial Engineering and Management. 1975.
Casel, Christine M.—BS (Russell Sage College), MS (ibid), EdD (Temple Univ); Professor Emeritus of Applied Health and Educational Psychology. 1985.
Cecil, Joe—BE (Anna Univ, India), MS (State Univ of New York), PhD (Texas A&M Univ); Associate Professor of Industrial Engineering and Management. 2009.
Chakroverty, Goutam—BTech (Indian Institute of Technology, Kharagpur), MS (Univ of Iowa), PhD (ibid); Professor of Marketing. 1991.
Chamber, Frank W.—BSME (Purdue Univ), MSME (Univ of Pennsylvania), PhD (Purdue Univ); Associate Professor of Mechanical and Aerospace Engineering. 1989.
Champlin, Franklin Ross—BS (University of Oklahoma), MS (ibid), PhD (ibid); Associate Professor of CHS: Biochemistry and Microbiology. 2006.
Chan, Eric David—BA (Macalister College), MS (Univ of Minnesota), PhD (ibid); Assistant Professor of Computer Science. 2011.
Chandler, Damon Michael—BS (The Johns Hopkins Univ), MS (Cornell Univ), PhD (ibid); Associate Professor of Electrical and Computer Engineering. 2006.
Chandra, Pratap—BSc (Univ of Moratuwa, Sri Lanka), MSc (ibid), PhD (Univ of Missouri, Columbia); Assistant Professor of Design, Housing & Merchandising. 2013.
Chan, John M.—BA (University of Central Oklahoma), MS (Univ of Missouri), PhD (ibid); Professor of Psychology. 1991.
Chang, Heung-Lo—BA (Central Police Univ, Taiwan), M.A. (Arizona State Univ), Ph.D. (Univ of Delaware); Assistant Professor of Political Science. 2015.
Chang, Young Bae—BS (Hanuk Aviation College), MS (Korea Advance Institute of Science and Technology), PhD (Ohio State Univ); Professor of Engineering Technology Division. 1991.
Chapiner, Virginia—BS (Oklahoma State University), MS (Worcester Polytechnic Institute); Assistant Professor of Engineering Technology Division. 2014.
Chen, Charles—PhD (Univ of British Columbia, Canada); Assistant Professor of Biochemistry & Molecular Biology. 2015.
Chen, Guangping—BS (Heilongjiang Univ, China), MS (Beijing Univ, China), PhD (Univ of Texas at Austin); Associate Professor of VBS: Physiological Sciences. 2001.
Chen, Tingting—BS (Harbin Institute of Technology, China), MS (ibid), PhD (State Univ of New York at Buffalo); Assistant Professor of Computer Science. 2011.
Cheng, An—BA (Hainan Normal Univ), MA (Guangdong Univ of Foreign Studies), PhD (Pennsylvania State Univ); Associate Professor of English. 2005.
Cheng, Qi—BE (Shanghai Jiao Tong Univ), MS (Syracuse Univ), PhD (ibid); Associate Professor of Electrical and Computer Engineering. 2006.
Cheville, Richard Alan—BSEE (Rice Univ), MSEE (ibid), PhD (ibid); Adjunct Associate Professor of Electrical and Computer Engineering. 1995.
Cho, Jongmin—BE (INHA Univ, Korea), MS. (Seoul National Univ, Korea), M.S. (The Univ. of British Columbia), Ph.D. (Univ. of Texas); Assistant Professor of Physics. 2015.
Choo, Paul—BA (Seoul National Univ of Technology, Korea), MFA (Iowa State Univ); Associate Professor of Art. 2012.
Chowdny, Giris—BEd (Royal Melbourne Institute of Technology), MS (Georgia Institute of Technology), PhD (ibid); Assistant Professor of Mechanical and Aerospace Engineering. 2013.
Christenson, Robert Stiles—BA (Queens College, Univ of New York), MS (Univ of Michigan), EdD (Brigham Young Univ); Assistant Professor of Applied Health and Educational Psychology 2007.
Chung, Chan—BS (Kon-Kuk Univ), MS (ibid), PhD (Univ of Minnesota); Professor of Agricultural Economics. 2003.
Chung, Yun Sun—BS (Sogang Univ, Korea), MS (Virginia Polytechnic Institute & State Univ.), PhD (Assistant Professor of Hotel and Restaurant Administration). 2011.
Clay, Gregory Paul—BA (Michigan State Univ), MBA (Univ of Phoenix), PhD (Michigan State Univ); Assistant Professor of Design, Housing & Merchandising. 2012.
Clark, Burton Adrian—BS (Strayer Univ), MA (Catholic Univ of America), EdD (Nova Southeastern Univ); Adjunct Professor of Political Science. 2013.
Clark, Julie Dorton—BS (University of Oklahoma), MS (Oklahoma State Univ), PhD (ibid); Assistant Professor of Applied Health and Educational Psychology 2007.
Clay, Mary Kristen—BS (Univ of North Carolina at Greensboro), MS (Univ of North Carolina at Chapel Hill), PhD (Univ of North Carolina at Greensboro); Assistant Professor of Communications Sciences and Disorders. 2012.
Clark, Peter E.—BS ( Oklahoma State Univ), PhD (ibid); Professor of Chemical Engineering. 2013.
Clark, Stephen L.—BS (University of Oklahoma Health Science Center), MS (ibid), PhD (Univ of Wisconsin-Madison); Assistant Professor of Nutritional Sciences. 2007.
Clay, Cynda R.—BS (California Polytechnic State Univ), MS (Purdue Univ), PhD ( North Carolina State Univ); Professor of Agricultural Economics. 2012.
Cline, David A.—BS (Brigham Young Univ), MBA (Utah State Univ), PhD (Univ of Oklahoma); Assistant Professor of Industrial Engineering. 2012.
Clinkenbeard, Kenneth D.—BS (Univ of California), DVM (ibid), PhD (Johns Hopkins Univ) Professor of VBS: Pathobiology. 2006.
Cobb-Greetham, Amanda Jane—BA (Southeastern Oklahoma State Univ), MS (Univ of North Texas), PhD (Univ of Oklahoma); Associate Professor of English. 2009.
Coffey, William Scott—BS (Valparaiso Univ), MS (Univ of Arkansas), PhD (Oklahoma State Univ); Adjunct Assistant Professor of Geology. 2009.
Coffman, Elizabeth—BS (Univ of Tennessee), MS (Ohio State Univ), DVM (ibid); Assistant Professor of VBS: Veterinary Clinical Sciences. 2015.
Cohen, Alex William—BS (Univ of Arizona), MS (ibid), MD (Yeshiva Univ), PhD (ibid); Associate Professor of Hotel and Restaurant Administration. 2007.
Cole, Belinda McCharen—BS (Southeastern Oklahoma State Univ), MEd (Univ of Central Oklahoma), EdD (Oklahoma State Univ); Associate Professor of Teaching and Curriculum Leadership. 2008.
Cole (Henderson), Janet C.—BS (South Dakota State Univ), MS (Kansas State Univ), PhD (Texas A&M Univ); Regents Professor of Horticulture and Landscape Architecture. 1988.
Cole-Lade, Gretchen—BS (Old Dominion Univ), MS (Boston Univ), PhD (Ohio State Univ); Assistant Professor of Human Development & Family Science. 2015.
Cohn, Terry R.—BS (Texas Tech Univ), MS (ibid), PhD (Oklahoma State Univ); Associate Professor of Industrial Engineering and Management. 2007.
Compton, Paul R.—BM (Univ of Texas at Arlington), MS (ibid), DMA (Univ of North Texas); Associate Professor of Music. 2003.
Condurac, Anne-Marie—BS (Lic Ind 37), MS (Rice Univ); DMA (Univ of Houston); Associate Professor of Music. 2005.
Confer, Anthony W.—BS (Oklahoma State Univ), MS (Ohio State Univ), DVM (ibid.), PhD (Univ of Missouri); Regents Professor of VBS: Pathobiology. 1981.
Conner, Joseph F.—BS (Oklahoma State Univ), MS (ibid.), PhD (ibid.); Adjunct Assistant Professor of Mechanical and Aerospace Engineering. 2010.
Conway, Tyrrell—BS (Oklahoma State Univ), PhD (Oklahoma State Univ); Professor of Microbiology & Molecular Genetics. 2015.
Cook, Gabriel—BS (Concordia Univ), PhD (Kansas State Univ); Assistant Professor of Chemistry. 2014.
Cook, John Paul—BS (Univ. of Oklahoma), MA (ibid.), PhD (ibid.); Assistant Professor of Mathematics. 2015.
Coon, Thomas—BA (Luther College), MS (Univ of California-Davis), Ph.D. (ibid.); Professor of Natural Resource Ecology and Management. 2014.
Cooper James F.—BA (Univ of Connecticut), MA (ibid.), PhD (ibid.); Professor of History. 1988.
Cooper Steven R.—BS (Texas Tech Univ), MS (Univ of Illinois), PhD (Oklahoma State Univ); Associate Professor of Animal Science. 1999.
Cordova, Carlos E.—BA (National Autonomous Univ of Mexico), MA (ibid.), PhD (Univ of Texas at Austin); Professor of Geography. 1997.
Cornell, Robert M.—BS (Truman State Univ), PhD (Univ of Utah, Salt Lake City); Associate Professor of Accounting. 2006.
Cosh, Michael H. — BS (Pennsylvania State Univ), MS (Cornell Univ), PhD (ibid.); Adjunct Associate of Plant and Soil Sciences. 2012.
Cox, Charles Bryan—BS (Oklahoma State Univ), MS (ibid.), PhD (ibid.); Professor of Agricultural Education. 1988.
Cox, Jr., Ronald Blake—BA (Harding Univ), MA (Univ of Louisiana, Monmee), PhD (Michigan State Univ); Assistant Professor of Human Development and Family Science. 2007.
Cramer, Joel Timothy—BA (Creighton Univ), MEd (Univ of Nebraska, Lincoln), PhD (ibid); Associate Professor of Applied Health and Educational Psychology 2011.
Cruer, Bruce Charles—BA (Haverford College), MA (Columbia Univ), PhD (ibid.); Professor of Mathematics. 1986.
Crevasch, Lorenzo—BS (Univ of Modena), MS (ibid.), PhD (Univ of Maryland); Associate Professor of Mechanical and Aerospace Engineering. 2006.
Crethar, Hugh C.—BS (Brighton Young Univ), PhD (Univ of Oklahoma); Associate Professor of Applied Health & Educational Psychology. 2009.
Crick, Christopher John—BA (Harvard Univ), MS (ibid.), PhD (Yale Univ); Assistant Professor of Computer Science. 2012.
Criss, Michael M.—BS (Illinois State Univ), MS (ibid.), PhD (Auburn Univ); Associate Professor of Human Development and Family Science. 2005.
Crochik, Sonia—MS (ibid.), DVM (ibid.); Associate Professor of VBS: Veterinary Clinical Sciences. 2012.
Croft, Julie May—BS (San Diego State Univ), MPH (Boston Univ), PhD (Joint Doctoral Program UCSD & SDSU); Assistant Professor of Applied Health and Educational Psychology. 2010.
Cross, Stephen Alan—BS (Univ of Arkansas), MS (ibid.), PhD (Auburn Univ); Professor of Civil and Environmental Engineering. 2003.
Cruise, Anna M.—BS (Univ of Missouri, Columbia), MS (ibid.), PhD (Massachusetts Institute of Technology/Woods Hole Oceanographic Institution [Joint Program]); Assistant Professor of Geology 2005.
Currier, Kevin M.—BS (State Univ of New York at Albany), MA (ibid.), PhD (ibid.); Professor of Economics. 1984.
Curry, Katherine A.—BS (West Texas State Univ), MED (Southeastern Oklahoma State Univ), EdD (Univ of Oklahoma); Assistant Professor of Educational Studies. 2011.
Curtis, Catherine R.—BM (Rider Univ), MS (Univ of Central Florida), PhD (ibid); Assistant Professor of Hotel and Restaurant Administration. 2011.
Curtis, Joseph Thomas—BS (Slippery Rock Univ), MS (Univ of Pittsburgh), PhD (Univ of Missouri); Assistant Professor of CHS: Pharmacology and Physiology. 2006.
Curtis, Kathleen S.—BS (Slippery Rock Univ), MS (Univ of Pittsburgh), PhD (ibid.); Assistant Professor of CHS: Pharmacology and Physiology. 2006.
D'Abrera, David M.—BA (Univ of Rhode Island), MA (Univ of Virginia), PhD (ibid.); Associate Professor of History. 2003.
D'Offay, Jean Michel—BSc (Pretoria, South Africa), Dip TVM (Edinburgh, Scotland), PhD (Univ of Missouri, Columbia); Professor of VBS: Pathobiology. 1986.
Dai, Ho-Kwok—IBMath (Univ of Waterloo), MS (Univ of Washington), PhD (ibid.); Associate Professor of Computer Science. 1998.
Dalal, Nikunj P.—BS (MS Univ), MBA (South Gujrat Univ), MS (Texas Tech Univ), PhD (South Gujrat Univ); Associate Professor of Management Science and Information Systems. 1990.
D'Andrea, David M.—BA (Univ of Rhode Island), MA (ibid.), MS (ibid.), PhD (ibid.); Associate Professor of Computer Science. 2006.
Davis, Charles Robert—BS (Univ of Oklahoma), MS (ibid.), PhD (ibid.); Associate Professor of Teaching and Curriculum Leadership. 2003.
Davis, Craig Allen—BS (Ohio State Univ), MS (Iowa State Univ), PhD (Texas Tech Univ); Associate Professor of Natural Resource Ecology and Management. 2001.
Davis, Kimberly Bryant—BA (Univ of Florida), MED (ibid.), PhD (Univ of Central Florida); Assistant Professor of Teaching and Curriculum Leadership. 2012.
Davis, Michael Scott—MS (Virginia Technical Univ), DVM (Texas A&M Univ), PhD (John Hopkins Univ); Associate Professor of VBS: Physiological Sciences. 1998.
Davis, Randall L.—BS (Oklahoma State Univ), MS (ibid.), PhD (Texas Tech Univ); Associate Professor of CHS: Pharmacology and Physiology. 2004.
Davis, Robert Evan—BS (Oklahoma State Univ), MBA (ibid.), PhD (ibid.); Clinical Assistant Professor of Management. 2011.
Dawson, Lionel James—BVSc (Madras Veterinary College), MS (Iowa State Univ); Professor of VBS: Veterinary Clinical Sciences. 2007.
Day, Greg—BA (Antioch College), JD (Univ of North Carolina), PhD (Univ of Mississippi); Assistant Professor of Economics. 2015.
de la Fuente, Jose—BS (Univ of Havana, Cuba), PhD (ibid.); Research Professor of VBS: Pathobiology. 2000.
Decker, William M.—BA (Denison Univ), PhD (Univ of Iowa); Professor of English. 1994.
DeFreitas, Jason Michael—BS (Univ of Connecticut), MS (Univ of Oklahoma), PhD (ibid.); Assistant Professor of Applied Health and Educational Psychology. 2013.
Delahoussaye, Ronald D.—BSME (Louisiana Technical Univ), MSME (Georgia Institute of Technology), PhD (Oklahoma State Univ); Adjunct Professor of Mechanical and Aerospace Engineering. 1995.
Delen, Dursun—BS (Istanbul Technical Univ), MS (Yildiz Technical Univ), PhD (Oklahoma State Univ); Assistant Professor of Management Science and Information Systems. 2002.
Deng, Junpeng—BS (Univ of Science & Technology, China), MS (Yildiz Technical Univ), PhD (Oklahoma State Univ); Assistant Professor of Management Science and Information Systems. 2002.
Deng, Shiping—BS (Southwest Agriculture Univ, China), MS (Oregon State Univ), PhD (Iowa State Univ); Professor of Plant and Soil Sciences. 1998.
Depperschmidt, Chad L.—BS (Oklahoma State Univ), MS (ibid.), EdD (ibid.) Assistant Professor of Educational Studies. 2009.
DeSilva, Udaya Enderawasam—BVSc (Univ of Peradeniya, Sri Lanka), MS (Kansas State Univ), PhD (Washington Univ); Associate Professor of Animal Science. 2001.
DeVoytst, Cheryl—BS (Purdue Univ.), M.S. (ibid.), PhD. (Univ. of Illinois at Urbana-Champaign); Professor of Agricultural Economics. 2015.
DeVoytst, Eric A.—BS (Michigan State Univ), MS (ibid.), PhD (Purdue Univ); Professor of Agricultural Economics. 2009.
DeYoung, Camille F.—BS (Michigan State Univ), MS (ibid.), PhD (ibid.); Associate Professor of Civil Engineering. 1995.
Dickinson, Amber R.—BA (The Univ of Oklahoma), MA (Oklahoma State Univ), PhD (The Univ. of Kansas); Clinical Assistant Professor of Political Science. 2011.
Dionne, Robert Andre—BS (State Univ of New York, Binghamton), MA (Embry Riddle Aeronautical Univ.), PhD (Oklahoma State Univ); Visiting Assistant Professor of Educational Studies. 2010.
Doherty, William J.—BA (St Paul's College), MA (Univ of Connecticut), PhD (ibid.); Adjunct Associate Professor of Human Development and Family Science. 2010.
Dottor, Gary Paul—BS (ibid.), MS (ibid.), PhD (ibid.); Adjunct Professor of Teaching and Curriculum Leadership. 2012.
Doucet, Andrew N.—BS (Univ of Sydney), DEd (Univ of New England), PhD (Univ of Melbourne); Assistant Professor of Botany. 2007.

Doye, Damona Grace—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Regents Professor of Agricultural Economics. 1986.

Dresser, Michael Edward—BA (Duke Univ), MD (ibid), PhD (ibid); Biochemistry and Molecular Biology. 2011.

Du, Yongtao—BA (Hunan Univ), MA (Beijing Univ), PhD (Univ of Illinois); Assistant Professor of History. 2009.

Dugat, Danielle Renee—BS (California Polytechnic State Univ), MS (ibid.), DVM (Oklahoma State Univ); Assistant Professor of VBS: Veterinary Clinical Sciences. 2013.

Duhon, Gary J.—BA (Nichols State Univ), MA (Louisiana State Univ), PhD (ibid); Associate Professor of Applied Health and Educational Psychology. 2001.

Dunlap, Wiley E.—BA (San Francisco State College), MS (Univ of Oregon), PhD (ibid); Regents Professor of Sociology. 2005.

Dunn, Bruce Lundy—BS (Oklahoma State Univ), MS (ibid), PhD (Univ of Arkansas); Assistant Professor of Horticulture and Landscape Architecture. 2009.

DuRant, Sarah Elizabeth—BS (Univ of South Carolina), MS (Virginia Tech Univ), PhD (ibid); Assistant Professor of Zoology 2013.

Dvorkin, Jack P.—MS (Moscow Univ), PhD (ibid); Adjunct Professor of Geology. 2012.

Dzialowski, Andrew R.—BS (Michigan State Univ), MA (Univ of Kansas), PhD (ibid); Associate Professor of Zoology 2007.

Eastman, Kenneth K.—BBA (Iowa State Univ), MS (ibid), PhD (Univ of Nebraska); Professor of Management. 1989.

Eberle, Richard W.—BA (Univ of California, Los Angeles), PhD (Baylor College of Medicine); Professor of VBS: Pathobiology. 1990.

Echelle, Anthony A.—BS (Southeastern Oklahoma State Univ), MS (Univ of Oklahoma), PhD (ibid); Regents Professor of Zoology. 1980.

Ede, Kenneth F.—BA (Univ of South Florida), MS (Northeastern State Univ), PhD (Oklahoma State Univ); Adjunct Professor of Environmental Sciences. 2008.

Edwards, Bryan D.—BS (Univ of Alabama), MS (Univ of South Alabama), PhD (Texas A&M Univ); Associate Professor of Management. 2010.

Edwards, Jeffrey Todd—BS (Western Kentucky Univ), MS (Univ of Arkansas), PhD (ibid); Associate Professor of Plant and Soil Sciences. 2004.

Edwards, Michael Craig—BS (Sam Houston State Univ), MEd (ibid), PhD (Texas A&M Univ); Professor of Agricultural Education. 2002.

Edwards, Steven William—BPE (Purdue Univ), MS (ibid), PhD (ibid); Professor of Applied Health and Educational Psychology. 1982.

Ekman, Erik—BA (Univ of California, Santa Cruz), MA (Univ of Michigan), PhD (ibid); Associate Professor of Foreign Languages and Literature. 2010.

Ekelid, Jonathan—BS (University of California, Santa Cruz), MS (Univ of Montana), PhD (ibid); Associate Professor of Philosophy. 2008.

Elkington, John—BS (University of California, Santa Barbara), MS (Central Washington Univ), PhD (Univ of Washington); Professor of Environmental Sciences. 2010.

El Rassi, Ziad—BS (Lebanese Univ), MS (Claude-Bernard Univ, France), PhD (ibid); Assistant Professor of Chemical Engineering. 2016.

Ekneligoda, Nishantha Chaminda—BSc (Univ of Moratuwa, Sri Lanka), MS (Southern Illinois Univ, Carbondale), PhD (ibid); Assistant Professor of Electrical & Computer Engineering. 2014.

Ekman, Erik—BA (Univ of California, Santa Cruz), MA (Univ of Michigan), PhD (ibid); Clinical Assistant Professor of Geography. 2015.

Elshahed, Mostafa Samir—BS (Cairo Univ), PhD (Univ of Oklahoma); Assistant Professor of Animal Science. 2002.

Eshelman, Dan—BS (North Carolina State Univ), PhD (Louisiana State Univ); Assistant Professor of Accounting. 2014.

Etemadpour, Ronak—M.Sc. (Univ of Sains, Malaysia), Ph.D. (Jacobs Univ Bremen); Assistant Professor of Computer Science. 2015.

Euliss, Ned H.—BA (Appalachian State Univ), MS (Humboldt State Univ), PhD (Oregon State Univ); Adjunct Assistant Professor of Zoology. 2010.

Fabregas, Maria (Lupita) Guadalupe—BS (Instituto Tecnologico y de Estudios Superiores de Monterrey), MS (Universidad Popular Autonoma del Estado de Puebla), PhD (Oklahoma State Univ); Assistant Professor of Nutritional Sciences. 2001.

Fahnenkamp, Heather Dawn Nicole—BS (Oklahoma State Univ), MS (Univ of Utah), PhD (Oklahoma State Univ); Assistant Professor of Chemical Engineering. 2006.

Fain, James Robert—BA (Univ of Texas at Austin), MS (Purdue Univ), PhD (ibid); Professor of Economics. 1986.

Fairbanks, Wendelyn Sue—BS (Nebraska Wesleyan Univ), MS (Colorado State Univ), PhD (Univ of Kansas); Assistant Professor of Natural Resource Ecology and Management. 2013.

Fan, Guoliang—BS (Xian Univ of Technology), MS (Xidian Univ of China), PhD (Univ of Delaware); Professor of Electrical and Computer Engineering. 2001.

Fang, Xiang—Associate Professor of Marketing. 2003.

Farris, Rodney Lewis—BS (ibid), BS (ibid), PhD (ibid); Adjunct Assistant Professor of Plant and Soil Sciences. 2010.

Fathpure, Babu—BS (Karnataka Univ), MS (ibid), PhD (Indian Inst of Science, Bangalore); Associate Professor of Microbiology and Molecular Genetics. 2000.

Fekete, Emily —BA (Univ of New Hampshire), BA (ibid), MA. (Kent State Univ), Ph.D. (Univ of Kansas); Clinical Assistant Professor of Geography. 2015.

Fennell, Christopher Joseph—BS (Duke Univ), PhD (Univ of Notre Dame); Assistant Professor of Chemistry. 2013.

Ferrell, Shannon Lee—BS (Oklahoma State Univ), MS (ibid), MB (Oklahoma City Univ School of Law); Assistant Professor of Agricultural Economics. 2008.

Fielder, Susan E.—BS (Univ of Oklahoma), MS, (Univ of Oklahoma), DVM, (Oklahoma State Univ); Clinical Assistant Professor of VBS: Pathobiology. 2016.

Fili, Paul A.—BA (Harvard Univ), PhD (Univ of Texas at Austin); Assistant Professor of Mathematics. 2013.

Finch, Bryan Lewis—BS (Univ of Oklahoma), MBA (Arizona State Univ), PhD (Texas A&M Univ); Visiting Professor of Management. 2011.

Finchum, George Allen—BS (East Tennessee State Univ), MA (Univ of Cincinnati), PhD (Univ of Tennessee); Associate Professor of Geography.1996.

Finchum, Tanya Ducker—BSW (East Tennessee State Univ), MA (Univ of Cincinnati), MLS (The Univ of Tennessee), PhD (Oklahoma State Univ); Professor of Sociology. 2006.

Fink, Kevin Jordan —BS (Truman State Univ), MS (Oklahoma State Univ), PhD (ibid); Research Associate of Nutritional Sciences. 2011.

Finley, Patrick Michael—BA (Univ. of Wisconsin at Eau Claire), MFA (Iowa State Univ); Assistant Professor of Art. 2013.

Fischer, Martin Alan—BS (Univ of California, Santa Barbara), MS (Central Washington State Univ), PhD (Univ of Oregon); Professor of Communication Sciences and Disorders. 2006.

Fishbein, Mark—BS (Univ of Illinois), MS (Univ of Arizona), PhD (ibid); Associate Professor of Botany. 2010.

Fishel, Daniel E.—BA (Carthage College), BS (Univ of Illinois), MS (ibid) PhD (ibid); Professor of Mechanical and Aerospace Engineering. 1999.

Fitch, John Benton—BS (Yale Univ), MS (Case Western Reserve Univ), PhD (ibid); Assistant Professor of Environmental Sciences. 2012.

Fitch, Lance M.—BS (Brigham Young Univ), MS (ibid), PhD (Univ of Arizona), Adjunct Assistant Professor of Accounting. 2009.

Fitch, Gerald—BS (California Polytech State Univ), MS (Colorado State Univ), PhD (ibid); Professor of Animal Science. 1987.

Flaherty-Pappas, Karen Eileen—BS (Providence College), MBA (Suffolk Univ), PhD (Univ of Massachusetts); Associate Professor of Marketing. 2002.

Focht, William J.—BS (Univ. of Ohio), BE. (Vanderbilt Univ), MA. (Oklahoma State Univ), PhD. (ibid); Associate Professor of Political Science. 1994.

Fontaine, Charles—BS (Texas A&M Univ.), MS (ibid.), PhD. (ibid.); Assistant Professor of Horticulture & Landscape Architecture. 2016.

Ford Verzypt, Ashlee—BS (Univ of Oklahoma), MS (Univ of Illinois at Urbana-Champaign), PhD (ibid.); Assistant Professor of Chemical Engineering. 2014.
Foubert, John D.—BA (College of William and Mary), MA (Univ of Richmond), PhD (Univ of Maryland, College Park); Associate Professor of Educational Studies. 2009.
Foutch, Gary Lynn—BS (Univ of Missouri, Rolla), MS (ibid), PhD (ibid); Regents Professor of Chemical Engineering. 1980.
Fox, Garey Alton—BS (Texas A&M Univ), MS (ibid), PhD (Colorado State Univ); Associate Professor of Biosystems and Agricultural Engineering. 2006.
Francisco, Christopher Alan—BS (Univ of Illinois, Urbana), MS (Cornell Univ), PhD (ibid); Associate Professor of Mathematics. 2007.
Frankwick, Gary—BBA (Univ of Wisconsin, Madison), MBA (Univ of Wisconsin, Oshkosh), PhD (Arizona State Univ); Associate Professor Emeritus of Marketing. 1990.
Frazer, Amy Elizabeth—BA (Dartmouth College), MA (West Chester Univ), PhD (State Univ. of New York at Buffalo); Assistant Professor of Geography. 2013.
Frazier, Robert Scott—BS (Ohio State Univ), MS (ibid), PhD (ibid); Assistant Professor of Biosystems and Agricultural Engineering. 2009.
Freeman, Craig—BA (John Hopkins Univ.), J.D. (Paul M. Herbert Law Center); Associate Professor of Media and Strategic Communications. 2014.
Frehney Brian W.—BA (Univ of California Los Angeles), MA (Univ of Nevada Las Vegas), PhD (Univ of Oklahoma); Associate Professor of History. 2006.
French, Donald P.—BS (Fordham Univ), MS (ibid), PhD (Indiana Univ); Professor of Zoology. 1992.
Fried, Vance H.—BS (Ohio State Univ), JD (Michigan State Univ); Professor of Entrepreneurship and Emerging Enterprise. 1987.
Frohock, Richard Randall—BA (The Colorado College), MA (Univ of California, Santa Barbara), PhD (ibid); Associate Professor of English. 1996.
Fry, Pamela Martin—BS (Univ of Oklahoma), MS (ibid), EdD (Oklahoma State Univ); Professor of Teaching and Curriculum Leadership. 2001.
Fuhrer, Samuel D.—BS (Angelo State Univ), MS (Texas A&M), PhD (ibid); Professor of Natural Resource Ecology and Management. 1997.
Furlong, Andrew S.—BS (Michigan State Univ), MA (Indiana Univ), PhD (Univ of Connecticut); Associate Professor of Sociology. 2008.
Fullerton, Jami A.—BA (Univ of Oklahoma), M (Univ of North Texas, Denton), PhD (Univ of North Texas); Associate Professor of Media and Strategic Communications. 1998.
Fulton Robert Wesley—BS (Ohio State Univ), MS (Washington State Univ), DVM (ibid), PhD (Univ of Missouri, Columbia); Regents Professor of VBS: Pathobiology 1982.
Fusco, Dale R.—BA (Eastern Illinois Univ), MA (ibid), PhD (Indiana Univ); Regents Professor of Educational Studies. 1967.
Furr, John—BA (Colorado State Univ), M.S. (Colorado State Univ), Ph.D. (Univ of Maryland); Professor VBS: Physiological Sciences. 2015.
Gade, Mary Nel—BS (Univ of Wisconsin, Oshkosh), MA (Michigan State Univ), PhD (ibid); Associate Professor of Economics. 1986.
Gaeta, Richard Joseph—BS (Georgia Institute of Technology), MS (Univ of Cincinnati), PhD (Georgia Institute of Technology); Adjunct Associate Professor of Mechanical and Aerospace Engineering. 2012.
Galusz, Frank—PhD (Stanford Univ), MA (ibid), BS (University of Illinois at Urbana-Champaign); Assistant Professor of Mechanical Engineering. 2006.
Garcia, Eric Anthony—BM (Univ. of Texas at Austin), MM (ibid.), DMA (Northwestern Univ); Professor of Music. 2002.
Garbutt, Keith—BSc (Univ of Wales), PhD (ibid); Professor of Botany. 2014.
Garcia, Eric Anthony—BM (Univ of Texas at Austin), MM (ibid.), DMA (Northwestern Univ); Assistant Professor of Music. 2003.
Gardner, Brandt Craig—BS (Brigham Young Univ), MS (ibid), PhD (Texas Tech Univ); Assistant Professor of Human Development and Family Science. 2004.
Gardner, Ryan Bernard—BM (Eastman School of Music), MM (Rice Univ), DMA (Manhattan School of Music); Assistant Professor of Music. 2011.
Garzon, Carla Domenica—BS (Pontificia Universidad Catolica del Ecuador), PhD (Pennsylvania State Univ); Assistant Professor of Entomology and Plant Pathology. 2009.
Gasek, Khaled A. M.—BS (Ohio State Univ), MS (Colorado State University of Mines), PhD (Univ of California, Berkeley); Professor of Chemical Engineering. 1987.
Gates, Gail Esther—BS (Texas Tech Univ), MS (ibid), PhD (Pennsylvania State Univ); Regents Service Professor of Nutritional Sciences. 1995.
Geertsema, Marten—BSc (Univ of Alberta), MSc (ibid), PhD (Univ of Utrecht, Netherlands); Department of Natural Resource Ecology and Management. 2010.
Gelder, John Ives—BS (Western Washington Univ), MS (Univ of Wisconsin), PhD (Univ of Arizona); Professor of Chemistry. 1977.
Gelfand, Scott D.—BA (Univ of Southern Florida), JD (Georgetown Univ Law Center), PhD (Univ of Maryland); Associate Professor of Philosophy 1998.
George, K. M.—BSc (Univ of Madras, India), MSc (ibid), PhD (State Univ of New York at Stony Brook); Professor of Computer Science. 1986.
Gethner, Perry J.—BA (Carleton College), MA (Yale Univ), PhD (ibid); Regents Professor of Foreign Languages and Literature. 1984.
Ghajar, Ashin J.—BS (Ohio State Univ), MS (ibid), PhD (ibid); Regents Professor of Mechanical and Aerospace Engineering. 1981.
Ghosh, Amit—BSc (Imperial College, London), PhD (Nottingham Univ); Professor of Mathematics. 1983.
Giacobbe, Alice C.—BSW (Virginia Commonwealth Univ), MEd (ibid), PhD (The College of William and Mary); Assistant Professor of Teaching and Curriculum Leadership. 2007.
Gibbs, Lincoln Alexander—BA (Northwood Univ), M.P.H. (Northern Illinois Univ), M.Ed. (Cleveland State Univ), Ed.D. (Northern Illinois Univ); Assistant Professor of Applied Health and Educational Psychology. 2010.
Giddens, Cheryl LeAnne—BS (Ohio State Univ), MS (ibid), PhD (ibid); Associate Professor of Communication Sciences and Disorders. 2004.
Gignac, Paul Michael—BS (Univ of Connecticut), PhD (Florida State Univ); Assistant Professor of CHS: Anatomy and Cell Biology. 2013.
Giles, Kristopher L.—BS (Alma College), MS (Iowa State Univ), PhD (ibid); Associate Professor of Entomology and Plant Pathology. 1997.
Gill, Duane A.—BA (Central College, Iowa), MA (Kansas State Univ), PhD (Texas A&M Univ); Professor of Sociology. 2011.
Gilliam, Lyndi Liane—BS (Ohio State Univ), DVM (ibid), Diplomate (ibid); Assistant Professor of VBS: Veterinary Clinical Sciences. 2009.
Gilmour, Maggi Anne—BS (Michigan State Univ), DVM (ibid); Associate Professor of VBS: Veterinary Clinical Sciences. 2009.
Good, James Keith—BS (Univ of Alaska Fairbanks), MA (ibid), PhD (ibid); Professor of Mechanical and Aerospace Engineering. 1980.
Goh, Ben Kok Beng—BS (Texas Tech Univ), MBA (Texas Tech Univ), EdD. (Nova Southeastern Univ); Professor of Hotel & Restaurant Administration. 2014.
Golliver, April Dawn—BM (Ohio City Univ), MM (Indiana Univ); Associate Professor of Music. 2002.
Gonzalez, Cristina Cruz—BA (Yale Univ), MA (Univ of Texas, Austin), MPhil (Cambridge Univ), PhD (Univ of Chicago); Assistant Professor of Art. 2008.
Good, James Keith—BSME (Ohio State Univ), MME (ibid), PhD (ibid); Professor of Mechanical and Aerospace Engineering. 1980.
Goddard, Laura E.—BS (Auburn University), MS (New Mexico State Univ), Ph.D. (ibid); Assistant Professor of Natural Resource Ecology and Management. 2015.
Gowin-daraaju, Nirmal—B.E. (National Institute of Technology, India), M.S. (Washington State Univ), Ph.D. (North Carolina State Univ); Assistant Professor of Materials Science and Engineering. 2014.
Grabowski, Timothy Brian—BS (Texas A&M Univ), BS (ibid), PhD (Clemson Univ); Department of Natural Resource Ecology and Management. 2011.
Graham, Emily E. —BA (Smith College), MA (Univ of St Andrews, Scotland), PhD (ibid); Assistant Professor of History. 2013.
Graham, Tony—BA (New College of California), MA (San Francisco State Univ), MFA (ibid); Associate Professor of English. 2000.
Gammer, Michael—BA (Univ of South Florida), MS (Southern Methodist Univ), PhD (Univ of Miami); Professor of Geology. 2012.
Grant, Deborah A.—BS (Pennsylvania State Univ), MA (State Univ of New York, Buffalo), PhD (ibid); Assistant Professor of Psychology. 2009.
Grantham, Richard Allen—BS (Univ of Central Oklahoma), MS (ibid), PhD (Oklahoma State Univ); Adjunct Assistant Professor of Entomology and Plant Pathology. 2003.
Greenbaum, Rebecca L.—BS (Univ of Florida), M.S. (Central Florida), Ph.D (ibid); Assistant Professor of Management. 2010.
Greenwood, Carmen—BS (Western Carolina Univ), MS (Longwood Univ), PhD (North Carolina State Univ); Assistant Professor of Entomology and Plant Pathology. 2007.
Green, Alex—BS (East Tennessee State Univ), M.S. (Univ. of Delaware), Ph.D. (ibid); Assistant Professor of Political Science. 2015.
Gregg, Jay Mason—BS (Bowling Green State Univ), MS (Ohio State Univ), PhD (Michigan State Univ); Professor of Geology. 2005.
Gregory, Garry H.—BS (Ohio State City Univ), MSCE (South Dakota Tech), PhD (Ohio State Univ); Adjunct Professor of Civil and Environmental Engineering. 2009.
Greiner, Alyson L.—BA (University of St Andrews, Scotland), MA (York University), PhD (ibid); Associate Professor of Chemistry. 2005.
Grindstaff, Jennifer Lynn—BA (Knox College), PhD (Indiana Univ); Assistant Professor of Zoology. 2007.
Grzychowski, Daniel R.—BS (Oregon State Univ.), MA (Columbia Univ), PhD (ibid); Regents Professor of Electrical and Computer Engineering. 1993.

Gross, Marjorie Ellen—BS (Univ of Oklahoma), MS (Univ of Illinois), DVM (Oklahoma State Univ); Associate Professor of VBS: Veterinary Clinical Sciences. 2010.

Grubgeld, M. Elizabeth—BA (Lewis and Clark College), PhD (Univ of Iowa); Professor of English. 1986.

Grzywacz, Joseph G.—BS [Univ of Wisconsin-Stevens Point], MS (ibid.), PhD (Univ of Wisconsin-Madison); Professor of Human Development & Family Science. 2012.

Guil, Tamara—BA (Univ of Chicago), DVM (Tufts Univ), PhD (Texas A&M Univ) Ph.D. (Texas A&M); Assistant Professor of VBS: Pathobiology. 2009.

Guo, Yuanxiang Richard—BS (HuaZhong Univ. of Science & Technology, China), MS (Univ of Florida), PhD (ibid.) Assistant Professor of Electrical & Computer Engineering. 2014.

Gustafson, John Eric—BS (Illinois State Univ), MS (ibid.), PhD (Univ of Zurich, Switzerland); Professor of Biochemistry & Molecular Biology. 20.12.

Gustavson, Kevin—BA (Carleton College), PhD (Univ of Wisconsin); Adjunct Assistant Professor of Environmental Sciences. 2007.

Guthaas, Matthew—BSE [Univ of Michigan], MSE (ibid.), PhD (ibid.); Adjunct Professor of Electrical & Computer Engineering. 2014.

Gwin, Mary Frances—BS (Univ of Oklahoma), MA (Oklahoma State Univ.), PhD (Univ of Oklahoma); Visiting Assistant Professor of Philosophy. 20.12

Habiger, Joshua Daniel—BS (Kansas State Univ), MS (ibid), PhD (Univ of South Carolina); Assistant Professor of Statistics. 2010.

Hadwiger, Jeffrey Allen—BS (Washington State Univ, Pullman), PhD (Univ of California, Santa Barbara); Associate Professor of Microbiology and Molecular Genetics. 1992.

Hagan, Martin Thomas—BS (Univ of Notre Dame), MS (Georgia Institute of Tech), PhD (Univ of Kansas); Professor of Electrical and Computer Engineering. 1986.

Haley, Joseph G.—BS (Univ of Washington, PhD (Princeton Univ); Assistant Professor of Physics. 2013.

Haley, Julia W.—BME (Oklahoma Baptist Univ), MME (Univ of Oklahoma), PhD (ibid); Associate Professor of Music. 1991.

Halihan, Todd—BA (Monmouth College), MS (Univ of Missouri), PhD (Univ of Texas, Austin); Associate Professor of Geology. 2000.

Halleck, Gene B.—BA (City College of New York), MA (Pennsylvania State Univ), MA (City Univ of New York), PhD (Pennsylvania State Univ); Associate Professor of English. 1991.

Hallemeier, Katherine M K—BA (The Univ of Toronto), MA (The Univ of British Columbia), PhD (Queen's Univ, Ontario); Assistant Professor of English. 2013.

Hallgren, Stephen W.—BS (Univ of Minnesota), MS (Oregon State Univ), PhD (Univ of California, Berkeley); Associate Professor of Natural Resource Ecology and Management. 1986.

Hambridge, K Michael—BA (Cambridge Univ), MB BChir (Cambridge and Westminster Medical School), Postgraduate (British Postgraduate Medical School); Department of Nutritional Sciences. 2009.

Hamilton, Douglas Wayne—BS (Univ of Arkansas), MS (Iowa State Univ), PhD (Pennsylvania State Univ); Associate Professor of Bioengineering. 1992.

Hamilton, Meredith—BS [Univ of Arkansas, Little Rock], MS (Memphis State Univ), PhD (Texas Tech Univ); Associate Professor of Zoology. 1996.

Hammer, Bryan Iwata—BS (Brigham Young Univ), MS (ibid.), PhD (Univ of Arkansas); Assistant Professor of Management Science and Information Systems. 2013.

Hammer, Tonya R.—BA (Univ of Texas at Arlington), MA (Univ of Mary Hardin - Baylor), PhD (St. Mary's Univ); Assistant Professor of Applied Health and Educational Psychology. 2013.

Hammon, Tracy Lyn—BS (Colorado State Univ), MS (ibid.), PhD (Oklahoma State Univ); Assistant Professor of Environmental Sciences. 2012.

Han, Jay C.—BS (Ohio State Univ); MA (California Institute of Technology), PhD (ibid); Associate Professor of Mechanical and Aerospace Engineering. 2005.

Hancer, Murat—BS (Dokuz Eylul Univ., Turkey), MS (Univ of New Haven), PhD (The Ohio State Univ); Associate Professor of Hotel and Restaurant Administration. 2006.

Hanks, Rue Re—BA (Univ of Missouri), MA (Univ of Kansas), PhD (ibid); Professor of Geography. 1998.

Hansen, Fredrick D.—BS (Iowa State Univ), MPH (Univ of Nebraska), PhD (ibid); Associate Professor of Educational Studies. 2001.

Hansen, Holley Elizabeth—BA (Truman State Univ), BS (ibid.), MA (Univ of Iowa), PhD (ibid.); Visiting Assistant Professor of Political Science. 2013.

Hanson, Gregory J.—BS (Univ of Minnesota), MS (Iowa State Univ), PhD (ibid.); Adjunct Associate Professor of Bioengineering. 1999.
Hershey, Douglas—BA (California State Univ, Northridge), MA (Univ of Southern California), PhD (ibid); Associate Professor of Psychology. 1996.

Hess, James Daniel—BS (Northeastern State Univ), MS (ibid), EdD (Oklahoma State Univ); Associate Professor of CHS: Family Medicine. 2006.

Hickman, Karen R.—BS (Oklahoma State Univ), PhD (Kansas State Univ); Professor of Natural Resource Ecology and Management. 2004.

High, Martin Scott—BS (Pennsylvania State Univ), MS (ibid), PhD (ibid); Associate Professor of Chemical Engineering. 1991.

Hildebrand, Deana A.—BS (Univ of Central Oklahoma), MS (ibid), PhD (Oklahoma State Univ); Assistant Professor of Nutritional Sciences. 2007.

Hileman, Mary Esther—BS (Univ of Michigan), MS (ibid), PhD (ibid); Adjunct Assistant Professor of Geology. 2008.

Hill, Aaron D.—BBA (Gonzaga Univ), MBA (ibid), PhD (Old Dominion State Univ); Assistant Professor of Management. 2012.

Hiney, Kris—BS (Univ of Illinois), M.S. (Texas A&M Univ), Ph.D. (Michigan State Univ); Assistant Professor of Animal Science. 2015.

Hinsdale, Myron E.—BS (Rocky Mountain College), DVM (Colorado State Univ), PhD (Univ of Alabama); Assistant Professor of VBS: Physiological Sciences. 2007.

Hirschcler, Beulah Marie—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Professor of Human Development and Family Science. 1970.

Hizirgah, Salim Selim—BS (Blacksea Technical Univ, Turkey), MS (Univ of California, Berkeley), PhD (Michigan State Univ); Associate Professor of Natural Resource Ecology and Management. 2000.

Hu, Chrwan-Jyh (David)—BS (National Chao-Tung Univ), MBA (Univ of Georgia), PhD (Michigan State Univ); Professor of Management Science and Information Systems. 1985.

Haagland, Bruce William—BA (Univ of Louisville), MS (Eastern Kentucky Univ), PhD (Univ of Oklahoma); Individuals Not Employed by OSU of Botany. 2005.

Hoback, Wyatt—BA (Randolph-Macon College), MS (Southwest Missouri State Univ), PhD (Univ of Nebraska); Assistant Professor of Entomology & Plant Pathology. 2014.

Hobson, Dana E.—BS (Baker Univ), MS (Kansas State Univ), MS (Kansas State Univ), PhD (ibid); Professor of Engineering Technology Division. 1996.

Hoff, Wouter David—BS (Univ of Amsterdam, The Netherlands), PhD (ibid); Professor of Microbiology and Molecular Genetics. 2005.

Hoff, Heidi Finch—BA (Northern Illinois Univ), MA (ibid), MPA (Northwestern State Univ); Professor of Theatre. 1988.

Hobbm, Todd C.—DVM (Univ of Georgia); Associate Professor of VBS: Veterinary Clinical Sciences. 2004.

Holcomb, Rodney—BS (Texas A&M Univ), PhD (ibid); Professor of Agricultural Economics. 1997.

Holmes, Tawni Welk—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Adjunct Professor of Nutritional Sciences. 2013.

Holmes, Teri Sue—BA (Univ of Tulsa), MS (Oklahoma State Univ), PhD (ibid); Adjunct Professor of Environmental Sciences. 2013.

Holzhausen, Derina Rhoda—BA (Univ of Pretoria), MA (Univ of South Africa), PhD (Rand Afrikans Univ); Professor of Media and Strategic Communications. 2008.

Holtzhausen, Lantz D.—BS (Univ of Florida), Ph.D. (ibid); Assistant Professor of Engineering Technology Division. 2014.

Hojoaka, Gilbert Reed—BS (Brigham Young Univ), MS (ibid), DVM (Washington State Univ), PhD (Univ of Kentucky); Professor of VBS: Veterinary Clinical Sciences. 1999.

Hong, Yang—BS (Phillips Univ), MS (ibid), PhD (Univ of Arizona); Department of Natural Resource Ecology and Management. 2011.

Horn, Gerald W.—BS (Texas Tech Univ), MS (Purdue Univ), PhD (ibid); Professor of Animal Science. 1974.

Horn, Justin—BA (Washington Univ, St. Louis), MA (Univ of Wisconsin-Madison), PhD (ibid); Assistant Professor of Philosophy. 2014.

Hort, Mei Wu—BA (Qiaohar Univ, China), MA (Louisiana State Univ), PhD (Texas A&M Univ); Visiting Assistant Professor of Teaching and Curriculum Leadership. 2010.

Hort, Peter R.—BS (Univ of Houston), MS (ibid), PhD (Univ of Texas Medical Branch); Research Associate Professor of Biochemistry and Molecular Biology. 2005.

Hu, Jingtong—BS (Shanghai Univ), MS (Univ of Texas at Dallas), PhD (ibid); Assistant Professor of Electrical & Computer Engineering. 2013.

Huang, Yinghua—BS (Huzhou Agricultural Univ), MS (ibid), PhD (Michigan Technological Univ); Adjunct Professor of Natural Resource Ecology and Management. 1994.

Hubach, Randolph—BA (Southern Methodist Univ), M.P.H. (California State Univ), Ph.D. (Indiana Univ); Assistant Professor of Applied Health and Educational Psychology. 2014.

Hubbs-Tait, Laura—BA (Univ of Michigan), MA (Boston Univ), PhD (ibid); Regents Professor of Human Development and Family Science. 1992.

Hughes, Charles—BA (Univ of Wisconsin-Madison), MA (ibid), PhD (ibid); Assistant Professor of History. 2014.

Hughes, Patricia Lynn—BS (Texas Christian Univ), MA (Texas Woman’s Univ), PhD (ibid); Associate Professor of Applied Health and Educational Psychology. 2002.

Huhnke, Raymond L.—BS (Purdue Univ), MS (Univ of Illinois), PhD (Iowa State Univ); Professor of Biosystems and Agricultural Engineering. 1980.

Hull, Debra Flint—BA (Univ of Tulsa), MS (Oklahoma State Univ), PhD (ibid); Adjunct Associate Professor of Applied Health and Educational Psychology. 2010.

Humphrey, Stephen Erik—BS (James Madison Univ), PhD (Michigan State Univ); Assistant Professor of Management. 2012.

Hunger, Robert Marvin—BS (Colorado State Univ), MS (ibid), PhD (Oregon State Univ); Professor of Entomology and Plant Pathology. 1982.

Huston, James L.—BA (Denison Univ), MA (Univ of Illinois), PhD (ibid); Regents Professor of History. 1980.

Hutcheson, Chris—BS (South Dakota State Univ), MS (ibid), PhD (Univ of Missouri); Associate Professor of Electrical and Computer Engineering. 1986.

Igrek, Apple Zefelius—BA (Michigan State Univ), MA (Vanderbilt Univ), PhD (ibid); Assistant Professor of Philosophy. 2012.

Ireland, Timothy C.—BS (Phillips Univ), MS (Oklahoma State Univ), PhD (ibid); Professor of Management Science and Information Systems. 1975.

Ivey Toni Ann—BS (Texas A&M Univ), MEd (ibid), PhD (ibid); Assistant Professor of Teaching and Curriculum Leadership. 2010.

Jackson, Todd A.—DVM (Purdue Univ); Associate Professor of VBS: Veterinary Clinical Sciences. 2012.

Jaco, William H.—BA (Fairmont State College), MA (Pennsylvania State Univ), PhD (Univ of Wisconsin); Regents Professor of Mathematics. 1982.

Jacob, Jamey Darin—BS (Univ of Oklahoma), MS (Univ of California), PhD (ibid); Professor of Mechanical and Aerospace Engineering. 2006.

Jacobs, Sue C.—BA (Antioch College), MA (Vermont College/Worchester College), PhD (Univ of Southern Mississippi); Associate Professor of Applied Health and Educational Psychology. 2001.

Jacobson, Bert H.—BS (Oklahoma State Univ), MEd (Northwestern Oklahoma State Univ), EdD (ibid); Professor of Applied Health and Educational Psychology. 1980.

Jadeja, Ravi—BS (Sardar Patel Univ, India), M.S. (ibid.), Ph.D. (ibid); Assistant Professor of Animal Science. 2012.

Jadeja, Ravirsingh P.—BS (Sardar Patel Univ, India), MS (ibid), PhD (ibid); Assistant Professor of Animal Science. 2015.

Jadlow Jr., Joseph M.—BS (Central Missouri State College), MS (ibid.), PhD (Univ of Virginia); Regents Service Professor Emeritus of Economics. 1968.

Jahanbahi, Farshid—BS (Tehran Univ), MS (ibid), PhD (Univ of Southern Mississippi); Associate Professor of Electrical and Computer Engineering. 2001.

Jahnke, Ron—BS (Ohio State Univ), MEd (ibid), PhD (ibid); School of Geology. 2010.

Jalalzai, Farida—BS (SUNY College at Brockport), M.A. (Univ of Buffalo), Ph.D. (ibid); Professor of Political Science. 2015.

Jann, Henry W.—BA (Bucknell Univ), MS (Brockport State College), DVM (Cornell Univ); Associate Professor of VBS: Veterinary Clinical Sciences. 2002.

Jaroni, Divya—BS (ibid.), BEd (Dev Akhaya Univ, India), MS (Univ of Nebraska-Lincoln), PhD (ibid); Assistant Professor of Animal Science. 2012.

Jaworski, Deborah—BS (The Ohio State Univ), MS (Oklahoma State Univ), PhD (The Ohio State Univ); Assistant Professor of Entomology and Plant Pathology. 2007.

Jayadas, Aditya—BS (Bangalore Institute of Technology, India), M.S. (St. Mary’s Univ), Ph.D (Texas Tech Univ); Assistant Professor of Design, Housing & Merchandising. 2014.

Jiaowal, Priyank—BSc (Indian Institute of Technology, India), MA (Rice Univ), PhD (ibid); School of Geology. 2010.

Jahangir, Padma—BS (University of California, Berkeley), MA (Boston University), PhD (ibid); Assistant Professor of Management. 2014.
Johnson, Jared L.—BA (Weber State Univ.), M.A. (Ohio Univ.), Ph.D. (Georgia State Univ.); Assistant Professor of Media and Strategic Communications. 2014.

Johnson, Mark Z.—BS (Oklahoma State Univ), MS (ibid), PhD (Kansas State Univ); Associate Professor of Animal Science. 1985.

Johnson, Scott Gerald—BS (Univ of Colorado), MBA (Michigan State Univ), PhD (Univ of Wisconsin); Associate Professor of Management. 2005.

Johnson, Sheila G.—BA (Baylor Univ.), M.L.S. (Univ. of Texas at Austin); Professor of Library. 2004.

Johnston, Jan H.—BS (Vakhosta State Univ), M.Ed (Univ of Texas, Austin), PhD (Univ of Texas, Arlington); Assistant Professor of Human Development and Family Science. 2007.

Johnson, Carol Bauman—BS (Illinois State Univ), MS (ibid), PhD (Arizona State Univ); Associate Professor of Accounting. 1992.

Johnson, Christine A.—BA (Alma College), MS (Iowa State Univ), PhD (ibid); Associate Associate Professor of Human Development and Family Science. 2009.

Johnson, Ellen McGowy—BS (Oklahoma State Univ), MS (ibid), DVM (ibid), PhD (ibid); Associate Professor of VBS: Pathobiology. 2007.

Johnson, Jared L.—BA (Weber State Univ), M.A. (Ohio Univ), Ph.D (Georgia State Univ); Assistant Professor of Media and Strategic Communications. 2014.

Johnson, Mark Z.—BS (Oklahoma State Univ), MS (ibid), PhD (Kansas State Univ); Associate Professor of Animal Science. 1985.

Johnson, Scott Gerald—BS (Univ of Colorado), MBA (Michigan State Univ), PhD (Univ of Wisconsin); Associate Professor of Management. 2005.

Johnson, Sheila G.—BA (Baylor Univ), M.L.S. (Univ of Texas at Austin); Professor of Library. 2004.

Johnston, Jan H.—BS (Vakhosta State Univ), M.Ed (Univ of Texas, Austin), PhD (Univ of Texas, Arlington); Assistant Professor of Human Development and Family Science. 2007.

Jones, Carol L.—BS (Oklahoma State Univ), PhD (ibid); Associate Professor of Biosystems and Agricultural Engineering. 2006.

Jones, Clinton J.—BA (Bethany College), Ph.D (Univ of Kansas); Professor of VBS: Pathobiology. 2015.

Jones, Edward J.—BA (Central Connecticut), MA (Ohio Univ), PhD (ibid); Associate Professor of English. 1987.

Jones, Jennifer Lynn—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Visiting Assistant Professor of Human Development and Family Science. 2011.

Jones, Rodney D.—BS (Kansan State Univ), MS (ibid), PhD (Virginia Technical Univ); Adjunct Assistant Professor of Agricultural Economics. 2012.

Jordan, Debra J.—BS (Slippery Rock Univ), MS (Western Illinois Univ), PhD (Indiana Univ); Professor of Applied Health and Educational Psychology. 1997.

Jordan, Jerry J.—BS (Central State Univ), MS (Univ of Oklahoma), Ed.D (Temple Univ); Associate Professor of Applied Health and Educational Psychology. 1984.

Jung, Ming—MS (Indiana Univ), PhD (ibid); Associate Professor of Mathematics. 2003.

Kable, Anthony C.—BS (The Australian National Univ), MS (Oxford Univ), PhD (Oklahoma State Univ); Associate Professor of Mathematics. 2001.

Kahn, Brian Aack—BS (Delaware Valley College), MS (Cornell Univ), PhD (ibid); Professor of Horticulture and Landscape Architecture. 1982.

Kapila, Ramesh—BSc (Banglore Univ, India), MA (Univ of Mangalore, India), PhD (Univ of Canterbury New Zealand); Assistant Professor of Communications Sciences and Disorders. 2012.

Kakani, Vijaya Gopal—BS (Jammu and Kashmir Univ), PhD (Indian Institute of Technology, Delhi); Regents Professor of Electrical and Computer Engineering. 2007.

Kakani, Vijaya Gopal—BS (Jammu and Kashmir Univ), PhD (Indian Institute of Technology, Delhi); Regents Professor of Electrical and Computer Engineering. 2007.

Kak, Subhash C.—BS (Jammu and Kashmir Univ), PhD (Indian Institute of Technology, Delhi); Regents Professor of Electrical and Computer Engineering. 2007.

Kallan, Ali K.—BS (Bogazici Univ, Turkey), MS (Penn State Univ), PhD (ibid); Assistant Professor of Mechanical and Aerospace Engineering. 2006.

Kamath, Manjunath—BS (Indian Institute of Technology), ME (Indian Institute of Science), PhD (Univ of Wisconsin); Professor of Industrial Engineering and Management. 1989.

Kang, Hyunsook—BS (Korea Univ, Korea), MS (Korea Univ), PhD (Univ of Minnesota); Associate Professor of Design, Housing and Merchandising. 2010.

Kapil, Sanjay—BVSc & AH (College of Veterinary Medicine, Hisar, India), MVSs (ibid), PhD (Univ of Minnesota); Professor of VBS: Pathobiology. 2006.

Karaca, Irem—BS (San Jose State Univ), MS (Ohio State Univ), PhD (ibid); Assistant Professor of Music. 2006.

Kard, Bradford M.—BA (San Jose State Univ), MS (Virginia Polytechnic State Univ), PhD (North Carolina State Univ); Associate Professor of Entomology and Plant Pathology. 2001.

Kaul, Anil K.—MPH (Univ of Minnesota), MD (Madras Univ); Associate Professor of CHS: Family Medicine. 2009.

Kaul, Rashmi—BS (Government Women's College, India), MS (Kashimir Univ, India), PhD (Delhi Univ, India); Associate Professor of CHS: Biochemistry and Microbiology. 2003.

Kaudal, Rakesh—BSc (CSKH Agricultural Univ, India), MSc (ibid.), PhD (Dr. B. R. Ambedkar Univ, India); Research Assistant Professor of Biochemistry & Molecular Biology. 2011.

Kazali, Harounan—BS (Univ of Ouagadougou), MS (ibid), PhD (Purdue Univ); Assistant Professor of Economics. 2010.

Kearney, Kerri Shultz—BS (Oklahoma State Univ), MBA (ibid), Ed.D (ibid); Associate Professor of Educational Studies. 2004.

Kennedy, Kay S.—BS (Cornell Univ), MS (State Univ of Albany), PhD (Iowa State Univ); Associate Professor of Nutritional Sciences. 2000.

Kennison, Sheila M.—BA (Harvard Univ), MS (Univ of Massachusetts), PhD (ibid); Associate Professor of Psychology 2000.

Ketterer, Stanley Eugene—BA (Univ of Missouri, Columbia), M.Ed (ibid), PhD (ibid); Associate Professor of Media and Strategic Communications. 1998.

Kenkel, Wil—BS (Univ of Kentucky), MBA (ibid), PhD (ibid); Regents Professor of Agricultural Economics. 2001.

Khan, Javed—BS (Pakistan Univ), MBA (Univ of Illinois), PhD (Iowa State Univ); Associate Professor of Entomology and Plant Pathology. 2000.

Khan, Ishaq—BS (Pakistan Univ), MBA (Univ of Illinois), PhD (ibid); Associate Professor of Entomology and Plant Pathology. 2000.
Koehler, Gerwald Anton—MS (Technical Univ, Munich, Germany), PhD (ibid); Assistant Professor of CHS: Biochemistry and Microbiology, 2011.

Kolarik, William J.—BS (Louisiana State Univ), MS (ibid), PhD (Oklahoma State Univ); Professor of Industrial Engineering and Management, 1999.

Konz, Suzanne M.—BS (Iowa Wesleyan College), MS (Indiana Univ), PhD (Brigham Young Univ); Assistant Professor of Applied Health and Educational Psychology, 2007.

Krasinski, Jerzy S.—MS (Univ of Warsaw), PhD (ibid); Professor of Electrical and Computer Engineering, 1999.

Kreibiel, Clinton—BS (Kansa State Univ), MS (ibid), PhD (Univ of Nebraska); Professor of Animal Science, 2000.

Kreibiel, Timothy Lee—BS (Illinois State Univ), MS (Purdue Univ), PhD (ibid); Professor of Finance, 1989.

Krinshan, Sadagopan—BSc (M.S. Univ, India), MSc (M.K. Univ, India), PhD (Univ of Connecticut); Assistant Professor of Chemistry, 2012.

Krumm, Bemita L.—BA (South Dakota State Univ), MA (ibid), MS (ibid), M.Ed (ibid), PhD (Univ of Nebraska); Assistant Professor of Educational Studies, 2005.

Krzmarzick, Mark J.—BS (Oklahoma State Univ), MS (Univ of Minnesota), PhD (ibid); Assistant Professor of Civil & Environmental Engineering, 2013.

Ku, Jiajun—PhD (Cornell Univ); Assistant Professor of Mathematics, 2007.

Kumar, Ajay—BTech (Indian Institute of Technology, Kharapur), MS (Univ of Nebraska, Lincoln), PhD (ibid); Assistant Professor of Biosystems and Agricultural Engineering, 2010.

Kusmanoff, Antone—BS (Univ of Missouri), BS (Southern Illinois Univ), MS. (Univ of Missouri), M.S. (Georgia Institute of Technology), Ph.D. (Oklahoma State Univ); Assistant Professor of Engineering Technology Division, 2014

Kutz, Mary N.—BBA (Univ of Central Oklahoma), MBA (ibid), EdD (Oklahoma State Univ); Associate Professor of Educational Studies, 1999.

Laib, Chalmer—BA (Ohio State Univ), MA (Univ of Tennessee), PhD (Univ of Texas, Austin); Associate Professor of Management, 1984.

Lacombe, Veronique A.—DVM (National Veterinary School of Maisons-Alfort), PhD (The Ohio State Univ.); Associate Professor of VBS: Physiological Sciences, 2012.

Lahir, Bidusha—BSc (Calcutta Univ), MS (Indian Statistical Institute), PhD (Univ of North Carolina, Chapel Hill); Assistant Professor of Economics, 2009.

Lalani, David L.—BS (Kansa State Univ), MS (Montana State Univ), PhD (Univ of Missouri); Associate Professor of Animal Science, 1996.

Lampert, David J.—BS (Oklahoma State Univ), MS (The Univ of Texas at Austin), PhD. (ibid); Assistant Professor of Civil & Environmental Engineering, 2016.

Lammers, Heather—BM (Univ of Western Ontario, Canada), MM (Eastman School of Music); Assistant Professor of Music, 2014.

Lammers, Thomas Martin—BM (Florida State Univ), MM (ibid), DMA (Eastman School of Music); Professor of Music, 1995.

Lansford, Notie Harold—BS (Texas A&M Univ), MS (ibid), PhD (ibid); Professor of Agricultural Economics, 1991.

Lao-Davila, Daniel Alberto—BS (Univ of Puerto Rico), MS (Florida International Univ), Ph.D. (Univ of Pittsburgh); Assistant Professor of Geology, 2012.

Larraga, Michael D.—BS (Oklahoma State Univ), MS (Univ of Houston), PhD (Texas Tech Univ); Associate Professor of Engineering Technology Division, 2009.

Larson, Mary Ann—BA (Harvard Univ), MA (Brown Univ), PhD (ibid); Professor of History, 2010.

Latzekere, Robert—BS (Wabash College), MS (Georgia Institute of Technology), PhD (Pennsylvania State Univ); Associate Professor of Human Development and Family Science, 2006.

Latino, Carl D.—BS (The City College of the City Univ of New York), MS (Pennsylvania State Univ), PhD (ibid); Associate Professor of Electrical and Computer Engineering, 1986.

Lavery, Jason E.—BA (Univ of California at Berkeley), MA (Yale Univ), MPhil (ibid), PhD (ibid); Associate Professor of History, 1997.

Lavine, Barry Kenneth—BA (Temple Univ), MS (Ohio State Univ), PhD (Pennsylvania State Univ); Associate Professor of Chemistry, 2004.

Lawson, Bradley P.—BA (Drury Univ), MS (Univ of Houston), PhD (Texas A&M Univ); Adjunct Professor of Accounting, 2012.

Lehl, Jiri—BA (San Diego State Univ), MA (ibid), PhD (Univ of California, San Diego); Assistant Professor of Mathematics, 2013.

Lee, Hang-Shim—BA (Ewha Women's Univ, Korea), M.A. (ibid), Ph.D. (Univ of Missouri; Columbia); Assistant Professor of Applied Health and Educational Psychology, 2014.

Lee, Jin Kyu—BBA (Yonsei Univ, Korea), MS (Griffith Univ, Australia), PhD (State University of New York, Buffalo); Associate Professor of Management Science and Information Systems, 2009.
Long, James M.—BS (Southwest Missouri State Univ), MS (ibid.), PhD (Oklahoma State Univ); Adjunct Assistant Professor of Natural Resource Ecology and Management. 2010.

Long, John—BS (North Carolina State Univ.), M.S. (ibid.), Ph.D. (ibid.); Assistant Professor of Biosystems & Agricultural Engineering. 2014.

Long, Michael A.—BA (Backnell Uni), MA (Univ of New Orleans), PhD (Colorado State Univ); Assistant Professor of Sociology. 2010.

Lopez-Campton, Refugia Lanette—IM (Univ of Nebraska), MM (Univ of North Texas); Associate Professor of Music. 2005.

Loss, Scott R.—BS (Univ of Wisconsin - Stevens Point), MS (Univ of Illinois), PhD (Univ of Minnesota); Assistant Professor of Natural Resource Ecology and Management. 2013.

Love, Brenda Cheryl—BS (East Central Uni), DVM (Oklahoma State Univ), PhD (Univ of California, Davis); Assistant Professor of VBS: Pathobiology. 2009.

Lovem, Matthew B.—BS (Duke Univ), PhD (Virginia Technical Univ); Associate Professor of Zoology 2003.

Lucas, Edrul Aniualdo—BS (Univ of Santo Tomas, Manila), PhD (Old State State Univ); Assistant Professor of Environmental sciences. 2004.

Lucas, Laurie A.—BBA (Univ of Oklahoma), MLIS (ibid), JD (ibid); Assistant Professor of Economics. 2007.

Lucca, Don A.—BS (Cornell Univ), MSE (Princeton Univ), PhD (Rensselaer Polytechnic Institute); Regents Professor of Mechanical and Aerospace Engineering. 1990.

Łukaszewski, Aaron W.—PhD (Univ of California, Santa Barbara); Assistant Professor of Psychology. 2014.

Luo, Qiming—BS (Beijing Forestry Univ), M.S. (Univ of Minnesota); Assistant Professor of Horticulture & Landscape Architecture. 2015.

Luse, Andrew W.—BA (Simpson College, Iowa), MBA (Iowa State Univ), MS (ibid), PhD (ibid.); Assistant Professor of Management Science and Information Systems. 2013.

Lusk, Jason Lee—BS (Texas Tech Univ), PhD (Kansas State Univ); Professor of Agricultural Economics. 2005.

Luttbeg, Bernard T.—BA (Univ of California), PhD (ibid); Assistant Professor of Zoology. 2009.

Lutter, Erika Ildiko—BSc (Univ of Lethbridge), MSc (Univ of Calgary), PhD (ibid); Assistant Professor of Microbiology & Molecular Genetics. 2013.

Lynd, Thomas B.—BS (Virginia Polytechnic Institute and State Univ), MS (ibid), PhD (Purdue Univ); Professor of Natural Resource Ecology and Management. 1982.

Lyon, Shane D.—DVM, (Okahoma State Univ); Assistant Professor of VBS: Veterinary Pathology. 2014.

Ma, Li—BS (Dailan Light Industry Institute, China), PhD (Purdue Univ); Associate Professor of Entomology and Plant Pathology. 2010.

MacAllister, Charles G.—DVM (Auburn Univ); Professor of VBS: Veterinary Clinical Sciences. 1979.

Madhally, Sundaranjan V.—BE (Bangalore Univ, India), MS (Wayne State), PhD (ibid); Associate Professor of Chemical Engineering. 2002.

Mafl, Gretchen Hilton—BS (Texas Tech Univ), MS (Colorado State Univ), PhD (Texas Tech Univ); Associate Professor of Animal Science. 2006.

Maguire, Karen—BA (Clark Univ), MA (Univ of Colorado, Boulder), PhD (ibid); Assistant Professor of Economics. 2012.

Mahalingan, Ramamurthy—BS (Univ of Agriculture Science, Bangalore, India), MS (Clemson Univ), PhD (ibid); Associate Professor of Biochemistry and Molecular Biology. 2003.

Malayer, Jerrry R.—BS (Purdue Univ), MS (ibid), PhD (Univ of Florida, Gainesville); Professor of VBS: Physiological Sciences. 1994.

Malone, Chad—BA (Ohio State Univ), MA (Univ of Toledo), PhD (Ohio State Univ); Assistant Professor of Sociology. 2005.

Maness, Niels O.—BS (Texas A&M Univ), MS (ibid), PhD (Ohio State Univ); Professor of Horticulture and Landscape Architecture. 1990.

Manimala, James—B.Tech. (College of Engineering Trivandum, Univ of Kerala), M.S.E. (Purdue Univ), Ph.D. (ibid.); Assistant Professor of Mechanical and Aerospace Engineering. 2014.

Manor, Michael Joseph—BS (Aquinas College), MBA (Grand Valley State Univ), PhD (Michigan State Univ); Adjunct Professor of Management. 2013.

Mansy, Khade A.—BA (Cairo Univ), MS (Helwan Univ), PhD (Illinois Institute of Technology); Associate Professor of Architecture. 2002.

Mantini, Lisa A.—BS (Univ of Pittsburgh), MA (Harvard Univ), PhD (ibid); Professor of Mathematics. 1985.

Manzer, L. Lee—BA (Okahoma State Univ), MBA (ibid), PhD (ibid); Professor of Marketing. 1975.

Mao, Yu Jessie—BS (Tsinghua Univ, China), MS (ibid), PhD (Massachusetts Institute of Technology); Assistant Professor of Biosystems and Agricultural Engineering. 2006.

Marek, Stephen M.—BS (Univ of Missouri), MS (ibid), PhD (Univ of California, Davis); Associate Professor of Entomology and Plant Pathology. 2003.

Marks, Steven Ken—BSE'd (Emporia State Univ), MS (ibid), EdD (Okahoma State Univ); Professor of Educational Studies. 1976.

Martin, Dennis Loren—BS (Univ of Illinois), MS (ibid), PhD (ibid); Professor of Horticulture and Landscape Architecture. 1990.

Mason, Marilyn Jean—BS (Michigan State Univ), MBA (ibid), PhD (Univ of Utah); Associate Professor of Marketing. 2002.

Materer, Nicholas F.—BS (Univ of Missouri), PhD (Univ of California, Berkeley); Associate Professor of Chemistry. 1998.

Matherly, James Edward—BS (Univ of Michigan), PhD (Univ of Maryland); Assistant Professor of Marketing. 2012.

Mathews, Adam J.—BA (State Univ of New York at Cortland), MA (Binghamton Univ.), PhD (Texas State Univ); Assistant Professor of Geography. 2014.

Matlock, KL Lynn—BS (Univ of Arkansas), M.S. (ibid.), Ph.D. (ibid); Assistant Professor of Educational Studies. 2014.

Mattern, Andrew—BFA (Un of New Mexico), M.F.A. (Univ of Minnesota); Assistant Professor of Art. 2015.

Matts, Robert L.—BS (Hamline Univ), PhD (Univ of Wisconsin, Madison); Regents Professor of Biochemistry and Molecular Biology. 1985.

Maxwell, Lara Kathleen—DVM (Univ of Florida), PhD (ibid); Associate Professor of VBS: Physiological Sciences. 2003.

Mayer, Robert John—BA (Univ of Michigan), MA (Northwestern), MA (San Francisco State Univ), PhD (Northwestern); Professor of English. 1991.

Mayfield, Blayne E.—BS (Univ of Missouri, Rolla), MS (ibid), PhD (ibid); Associate Professor of Computer Science. 1988.

McBee, Karen—BS ( Baylor Univ), MS (Texas Tech Univ), PhD (Texas A&M Univ); Professor of Zoology. 1987.

McCann, Joseph P.—BSc (Edinburgh Univ), MS (Cornell Univ), PhD (ibid); Associate Professor of VBS: Physiological Sciences. 1987.

McCann, Melinda H.—BA (Univ of Missouri), PhD (Univ of South Carolina); Professor of Statistics. 1994.

McCorrnick, Brian—BS (Luther College), MS (Michigan State Univ.), PhD (Univ of Minnesota); Adjunct Professor of Entomology & Plant Pathology. 2013.

McElroy, Kathleen O.—BA (Texas A&M Univ), PhD (Univ of Texas at Austin); Assistant Professor of Media and Strategic Communications. 2014.

McFarlane, Brian—BS (Cornell Univ), MS (ibid), PhD (ibid); Professor of Agriculture at Davis; Assistant Professor of Media and Strategic Communications. 2014.

McGrew, Kevin S.—BA (Moorhead State Univ), MS (ibid.), PhD (Univ of Minnesota); Assistant Professor of Applied Health and Educational Psychology. 2007.

McGlynn, William George—BA (Univ of California at Davis), MS (Univ of Arkansas), PhD (ibid); Associate Professor of Horticulture and Landscape Architecture. 2004.

McGuire, John Patrick—BS (Northwest Missouri State Univ), MA (ibid.), PhD (Univ of Missouri); Associate Professor of Media and Strategic Communications. 2002.

Mclntyre, Nancy E.—BS (Georgia), MS (ibid.), PhD (ibid); Associate Professor of Zoology 2013.

McKeever, Stephen W.S.—BS (Univ of North Wales, Bangor), MS (ibid), PhD (ibid); Regents Professor of Physics. 1983.

McKinon, Lori Melton—BS (Arizona State Univ), MS (Okahoma State Univ), PhD (Univ of Oklahoma); Associate Professor of Media and Strategic Communications. 2005.

McLaughlin, Heather Rae—BA (Univ of Maine), PhD (Univ of Minnesota); Assistant Professor of Sociology 2013.

McMurry, Scott T.—BS (Okahoma State Univ), MS (ibid), PhD (ibid); Professor of Zoology 2007.

McNamara, Gerry Michael—BA (Univ of San Diego), MBA (ibid.), PhD (Univ of Minnesota); Assistant Professor of Management. 2012.

Meek, William D.—BS (Baylor Univ), PhD (Baylor College of Dentistry); Professor of CHS: Anatomy and Cell Biology. 1985.
Meinke, David W.—BA (College of Wooster), PhD (Yale Univ); Regents Professor of Botany. 1982.

Meinkoth, James H.—MS (Ohio State Univ), DVM (ibid), PhD (Washington State Univ); Professor of VBS: Pathobiology 1992.

Melancon, Celeste L.—BS (Auburn Univ, AL), MS (Penn State Univ), PhD (ibid); Assistant Professor of Political Science. 2012.

Mehra, Prachi—BA (Penn State Univ), MA (ibid), PhD (ibid); Associate Professor of English. 2017.

Mehlman, Alice R.—BS (Boston Univ), MA (ibid), PhD (ibid); Assistant Professor of Social Work. 1998.

Melsom, Adam—BA (Carleton College), MA (ibid), PhD (ibid); Assistant Professor of Agricultural Economics. 2014.

Mendoza, Karen A.—BS (Iowa State Univ), MA (ibid), PhD (ibid); Clinical Professor of Educational Administration. 1998.

Mendonca, Madhav—BA (Iowa State Univ), MA (ibid), PhD (ibid); Assistant Professor of Anthropology. 2012.

Mendes, Jeanette Morehouse—BS (Santa Clara Univ), MA (Indiana Univ), PhD (ibid); Associate Professor of Political Science. 2006.

Mendes, Jesse Perez—BA (Midwestern State Univ), MA (Texas Tech Univ), JD (Indiana Univ), PhD (ibid); Associate Professor of Educational Studies. 2005.

Menke, Jeffrey Michael—BA (Univ of Louisville), MA (Vanderbilt Univ), MFA (Colorado State Univ), PhD (ibid); Assistant Professor of English. 2011.

Merrin, Jeffrey A.—BS (Duke Univ), PhD (Cornell Univ); Assistant Professor of Mathematics. 2009.

Merten, Michael J.—BA (Univ of Wisconsin, Eau Claire), MS (Iowa State Univ), PhD (ibid); Associate Professor of Human Development and Family Science. 2006.

Metheny, Jaret—Assistant Professor of Engineering Technology Division. 2015.

Miao, Li—BA (Nankai Univ, China), MS (Iowa State Univ), PhD (The Pennsylvania State Univ); Associate Professor of Hotel & Restaurant Administration. 2015.

Milam, John D.—BS (Valdosta State Univ), BS (Georgia College), MS (Georgia State Univ), PhD (Georgia Tech); Assistant Professor of Biological Sciences. 1990.

Miller, Ronald Keith—BA (Central Michigan Univ), MA (ibid), PhD (ibid); Regents Professor of Microbiology and Molecular Genetics. 1991.

Miller, Robert V.—BA (Penn State Univ), MA (ibid), PhD (ibid); Assistant Professor of Plant and Soil Sciences. 1978.

Miller, Rita K.—BA (Penn State Univ), MA (ibid), PhD (ibid); Associate Professor of CHS: Anatomy and Cell Biology. 2012.

Miller, Kenneth Eugene—BA (William and Mary College), MA (ibid), PhD (ibid); Assistant Professor of Psychology. 2009.

Miller, Janice Williams—BS (Iowa State Univ), MS (ibid), PhD (ibid); Assistant Professor of Educational Studies. 2006.

Miller, Bridget Marie—BA (Iowa State Univ), MA (ibid), PhD (ibid); Assistant Professor of Applied Health and Educational Psychology. 2004.

Miller, Loretta A.—BS (Illinois State Univ), MS (ibid), PhD (ibid); Visiting Assistant Professor of Educational Studies. 2006.

Miller, Mandy A.—BA (Iowa State Univ), MA (ibid), PhD (ibid); Assistant Professor of Educational Studies. 2008.

Miller, M. “B”—BS (Penn State Univ), MS (Iowa State Univ), PhD (ibid); Assistant Professor of Electrical & Computer Engineering. 2013.

Mills, Melissa Ann—BS (Oklahoma State Univ); Visiting Assistant Professor of Educational Studies. 2006.

Mills, Melissa Ann—BS (Oklahoma State Univ), MA (ibid), PhD (ibid); Clinical Instructor of Mathematics. 2014.

Minghetti, Matteo—Ph.D. (Univ. of Stirling, United Kingdom); Assistant Professor of Zoology. 2015.

Mintmire, John W.—BS (Univ of Florida), PhD (ibid); Regents Professor of Physics. 2001.

Miszalski, Joseph P.—BM (Michigan State Univ), MM (Univ of Cincinnati), DMA (Univ of Colorado); Professor of Music. 1986.

Mitchell, Thomas K.—BS (Pennsylvania State Univ), MS (Clemson Univ), PhD (North Carolina State Univ); Adjunct Assistant Professor of Entomology and Plant Pathology. 2008.

Miz, Tamara Lee—BA (James Madison Univ), MA (Univ of Tennessee), PhD (ibid); Associate Professor of Sociology. 2005.

Moberg, Carol Lynn—BA (State Univ of New York, Geneseo), MA (State Univ of New York, Buffalo), PhD (ibid); Associate Professor of English. 1986.

Moen, Daniel—BA (North Dakota State Univ), Ph.D. (Stony Brook Univ); Assistant Professor of Zoology. 2015.

Mohanty, Smita—BS (IIT Kharagpur, India), MS (Univ of Delhi, India), PhD (ibid); Associate Professor of Chemistry. 2014.

Mohamed, Adam—BA (Harvard Univ), M.S. (Univ of Chicago), Ph.D. (Univ of Georgia); Assistant Professor of Statistics. 2015.

Moon, Sungwoong—BA (Yonsei Univ, Korea), MA (ibid), EdD (Columbia Univ); Assistant Professor of Teaching and Curriculum Leadership. 2011.

Moore, Tami L.—BA (Ibid), MA (Ibid), PhD (Washington State Univ); Assistant Professor of Educational Studies. 2009.
Peraz, Eva—BS (Polytechnic Univ of Tirana), MS (Institut Français du Petrole), PhD (Univ of Oklahoma); Adjunct Assistant Professor of Geology. 2012.

Pezeshki, Adel—B.Sc. (Zanjan Univ, Iran), M.Sc. (Isfahan Univ. of Technology Iran), PhD. (Ghent Univ, Belgium); Assistant Professor of Animal Science. 2016.

Phillips, Brenda Diane—BA (Baylor College), MA (The Ohio State Univ), PhD (ibid); Professor of Political Science. 2005.

Phillips, John Joseph—B.AE (Oklahoma State Univ), MAE (ibid); Associate Professor of Architecture. 2003.

Piao, Daqing—BS (Tsinghua Univ, China), MS (Univ of Connecticut), PhD (ibid); Associate Professor of Electrical and Computer Engineering. 2005.

Pivato, Griffin Patrick—BA (McNese State Univ), JD (Univ of Texas); Assistant Professor of Economics. 2010.

Place, Sara Elisabeth—BS (Cornell Univ), PhD (Univ of California, Davis); Assistant Professor of Animal Science. 2013.

Polikar, Michael H.—BS (Carnegie-Mellon Univ), PhD (Univ of Oklahoma); Professor of CHS: Psychiatry and Behavioral Sciences. 1981.

Puloncheck, John A.—BA (Northernwestern Univ), MS (Georgia Institute of Technology), PhD (ibid); Professor of Finance. 1983.

Poncy, Brian Charles—BA (Univ of Northern Iowa), EdS (ibid), PhD (Univ of Tennessee); Assistant Professor of Applied Health and Educational Psychology. 2009.

Poole, Thomas Andrew—B.M. (The Univ of Texas at Austin), M.M. (Univ of Miami), D.M.A. (ibid); Assistant Professor of Music. 2015.

Pope, Carey N.—BS [Stephen F. Austin State Univ], MS (ibid), PhD (Univ of Texas at Houston); Regents Professor of VBS: Physiological Sciences. 2000.

Pope, Jing Liu—MS (Beijing Medical Univ), MD (ibid), PhD (Univ of Louisiana, Monroe); Research Scientist of VBS: Physiological Sciences. 2002.

Potts, Charles Richard—BA (Univ of North Carolina, Charlotte), MA (Univ of Kansas), PhD (ibid); Associate Professor Emeritus of Psychology. 1990.

Pourhabib, Arash—BS (Sharif Univ.of Technology Iran), PhD (Texas A&M Univ); Assistant Professor of Industrial Engineering and Management. 2014.

Prade, Rolf Alexander—BS (Univ of San Paulo), MS (ibid), PhD (ibid); Professor of Microbiology and Molecular Genetics. 1995.

Privett, David B.—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Associate Professor of Industrial Engineering and Management. 1992.

Prestamo, Anne M.—BM (Kent State Univ), MLS (Univ of Wisconsin-Milwaukee), EdD (Oklahoma State Univ); Professor of Teaching and Curriculum Leadership. 2007.

Preston, Dennis Richard—BA (Univ of Louisville), PhD (Univ of Wisconsin, Madison); Regents Professor of English. 2008.

Price, Taryn—BS (Univ of Texas at Austin), M.S. (Middle Tennessee State Univ.), Ph.D. (ibid.); Assistant Professor of Applied Health and Educational Psychology. 2015.

Price III, Joseph A.—BS (Rutgers Univ), PhD (Univ of Massachusetts); Professor of CHS: Pathology. 1985.

Pritsker, Igor E.—BA (Donskoe State Univ USSR), MS (ibid), PhD (Univ of South Florida); Professor of Mathematics. 2001.

Puckett, Jonathan David—MS (Kansas State Univ), DVM (Oklahoma State Univ); Assistant Professor of VBS: Veterinary Clinical Sciences. 2012.

Puckett, James O.—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Associate Professor of Geology. 2000.

Pullen, Alana—BS (Oregon State Univ), MS. (Univ of Nebraska), Ph.D. (Ohio State Univ); Assistant Professor of Design, Housing & Merchandising. 2015.

Pumphrey, Lela Dale—BSBA (Univ of Southern Mississippi), MBA (Arkansas State Univ), PhD (Univ of Missouri-Columbia); Clinical Associate Professor of Accounting. 2013.

Puterka, Gary Joseph—BS (Univ of Wyoming), MS (ibid), PhD (Oklahoma State Univ); Adjunct Associate Professor of Entomology and Plant Pathology. 2005.

Qu, Hailin—BS (Northern Arizona Univ), MS (Purdue Univ), PhD (ibid); Regents Professor of Hotel and Restaurant Administration. 1999.

Quan, Tracy Michelle—BS (Univ of California, San Diego), PhD (Massachusetts Institute of Technology); Assistant Professor of Geology. 2010.

Raff, Lionel Mischa—BS (Univ of Oklahoma), MS (ibid), PhD (Univ of Illinois); Regents Professor of Chemistry. 1964.

Rahaim, Ronald James—BS (Michigan State Univ), MS (ibid), PhD (ibid); Assistant Professor of Chemistry. 2011.

Rahnadvard, Nazanin—BS (Sharif Univ of Technology), MS (ibid), PhD (Georgia Institute of Technology); Assistant Professor of Electrical and Computer Engineering. 2009.

Rajamani, Vignesh—BS (Univ of Madras, India), MS (Oklahoma State Univ.), PhD (ibid); Visiting Assistant Professor of Electrical & Computer Engineering. 2013.

Ramakumar, Ramachandra Gupta—BE (Univ of Madras), M.Tech (Indian Inst of Technology), PhD (Cornell Univ); Regents Professor of Electrical and Computer Engineering. 1967.

Ramana, Ranjith—BSc (Kerala Agricultural Univ, India), MS (Univ of Connecticut), PhD (ibid); Assistant Professor of Animal Science. 2012.

Raming, Carisa Huey—BAE (Oklahoma State Univ.), MAE (ibid.), MS (ibid); Assistant Professor of Architecture. 2011.

Ramsay Chris—BFA (Univ of Michigan), MFA (Texas Tech Univ); Professor of Art. 2002.

Ramey, Jon W.—BS (Oklahoma State Univ), MS, PhD (ibid) (ibid); Associate Professor of Agricultural Education. 2010.

Ramey, Joshua D.—BS (Oklahoma State Univ), MS (Univ of Illinois, Urbana), PhD (ibid); Associate Professor of Chemical Engineering. 2008.

Ranjani, Ashish—B.Sc.(Madras Veterinary College, India), PhD (Virginia Technical Univ); Assistant Professor of VBS: Physiological Sciences. 2012.

Rao, Ramesh P.—BS (Univ of the Philippines), MBA (Asian Institute of Management), PhD (Texas Tech Univ); Professor of Finance. 2002.

Raper, Kelie—BS (Oklahoma State Univ), MS, PhD (Texas A&M Univ); Associate Professor of Agricultural Economics. 2009.

Rau, William Robert—BS (Oklahoma State Univ), MS (ibid), PhD (Univ of Nebraska); Regents Professor of Plant and Soil Sciences. 1991.

Ray, Christopher Michael—BS (Univ of Missouri, Rolla), MS (Oklahoma State Univ), PhD (ibid); Adjunct Assistant Professor of Educational Studies. 2010.

Rayas-Duarte, Patricia—BS (Univ of Sonora, Mexico), MS (Univ of Nebraska), PhD (ibid); Professor of Biochemistry and Molecular Biology. 1997.

Rebek, Eric J.—BS (Univ of Wisconsin, Madison), MS, PhD (ibid), PhD (Purdue Univ); Assistant Professor of Entomology and Plant Pathology. 2008.

Recker, Doren A.—BA (Southern Illinois Univ), MA (ibid), MS (Univ of Illinois), PhD (ibid); Associate Professor of Philosophy. 1988.

Reed, Hal C.—BS (Ori Roberts Univ), MS (Texas A&M Univ), PhD (Washington State Univ); Adjunct Associate Professor of Entomology and Plant Pathology. 2004.

Reese, Brandon—BFA (Kansas City Art Institute), MFA (Bowling Green State Univ); Associate Professor of Art. 2005.

Regueiro de Atiles, Julia Teresa—BS (Virginia Polytechnic Inst and State Univ, MS (Florida State Univ), PhD (Virginia Polytechnic Inst and State Univ); Associate Professor of Human Development and Family Science. 2010.

Reichard, Mason V.—BS (Central Michigan Univ), MS (Norther Michigan Univ), PhD (Oklahoma State Univ); Assistant Professor of VBS: Pathobiology 2008.

Reid, Karl Neville—BS (Oklahoma State Univ), MS (ibid.), DSc (Massachusetts Institute of Technology); Regents Service Professor of Mechanical and Aerospace Engineering. 1964.

Reilly, Frank Kent III—BA (Univ of West Florida), MA (Univ of Texas, Austin), PhD (ibid); Assistant Professor of History. 2012.

Reinh, Suzanne L.—BA (Albright College), MLS (Univ of Michigan); Associate Professor of Library. 2014.

Reiskind, Michael Hay—AB (Amherst College), MPH (Univ of Michigan), PhD (ibid); Assistant Professor of Entomology and Pathology. 2009.

Reitan, Eric H.—BA (Univ of Rochester), PhD (State Univ of New York, Buffalo); Professor of Philosophy. 2000.

Renner, Justen Michael—B.F.A. (Cameron Univ), M.F.A. (Univ of Oklahoma); Associate Professor of Art. 2013.

Reuter, Ryan—BS (Oklahoma State Univ), MS, PhD (ibid), Ph.D. (Texas Tech Univ); Associate Professor of Animal Science. 2014.

Rezabek, Grant B.—BS (Univ of Virginia), MPH (Univ of Oklahoma Health Science Center), DVM (Oklahoma State Univ); Assistant Professor of VBS: Pathobiology. 2006.

Rhinehart, R. Russell—BS (Univ of Maryland), MS (ibid), PhD (North Carolina State Univ); Professor of Chemical Engineering. 1997.

Rich, Jamie Paul—BS (Indiana Univ at Pennsylvania), MS (Univ of Oklahoma), PhD (ibid); Visiting Assistant Professor of Geology. 2012.

Richards, Christopher J.—BS (Texas A&M Univ), MS (Univ of Nebraska), PhD (Univ of Kentucky); Associate Professor of Animal Science. 2005.

Richmond, Edward—Ph.D. (Univ of North Carolina at Chapel Hill); Assistant Professor of Mathematics. 2014.

Richtsmeier, Peter—BA (Univ of North Carolina at Chapel Hill); Associate Professor of Communications Sciences and Disorders. 2014.

Röck, Dan S.—BS (Univ of Wyoming), M.P.A. (ibid.), Ph.D. (ibid.); Regents Professor of Economics. 1996.

Riedinger, Natasha—M.S. (Univ. of Bremen), Ph.D. (ibid.); Assistant Professor of
Geology. 2014.

Rigg, Angel Noel—BA (Univ of Central Oklahoma), MS (Northern State Univ), PhD (Oklahoma State Univ); Lecturer of Agricultural Education. 2011.

Riley, John Michael—BS (Mississippi State Univ), M.S. (ibid.), Ph.D. (Kansas State Univ); Assistant Professor of Agricultural Economics. 2015.

Rimmel, Lesley A.—BA (Yale College), MA (Columbia Univ), PhD (Univ of Pennsylvania); Associate Professor of History. 1999.

Ringsmuth, Eve M.—BA (Washington Univ, St. Louis), MA (Univ of Minnesota), PhD (ibid); Assistant Professor of Political Science. 2010.

Rithey, Jerry W.—BS (Oklahoma State Univ), DVM (ibid), PhD (North Carolina State Univ); Professor of VBS: Pathobiology 1997.

Rizadinova, Flora—MS (Moscow State Univ), PhD (ibid); Assistant Professor of Physics. 2005.

Roberts, Emily—BA (California State Univ, Fullerton), MA (Univ of Missouri-Columbia), MArch, (Univ of New Mexico), PhD (Univ of Missouri-Columbia); Assistant Professor of Design, Housing & Merchandising. 2015.

Robinette, Kathleen M.—BA (Wright State Univ, State Univ); PhD (Univ of Cincinnati); Professor of Design, Housing & Merchandising. 2012.

Robinson, Jeremy Shane—BS (Oklahoma State Univ), MS (ibid), PhD (Univ of Missouri, Columbia); Professor of Agricultural Education. 2007.

Robinson, Robert Louis—BS (Oklahoma State Univ), M.S. (ibid.), Ph.D. (ibid.); Regents Professor Emeritus of Chemical Engineering. 1965.

Rocatel, Alex Caldeira—BS (UNESP, Brazil), M.S. (Auburn Univ), Ph.D. (Texas Tech Univ); Assistant Professor of Plant and Soil Sciences. 2015.

Rochat, Mark Clement—M.S. (Univ of Missouri), D.V.M. (Mississippi State Univ); Professor of VBS: Veterinary Clinical Sciences. 1994.

Roggia, Aaron—BA (Brigham Young Univ), M.A. (ibid.), PhD (Pennsylvania State Univ); Assistant Professor of Foreign Languages and Literature. 2014.

Rohr, Richard Carlton—BA (Bucknell Univ), MA (Univ of Nebraska), PhD (ibid); Professor of History. 1976.

Rolf, Megan Margaret—BS (Kansas State Univ), MS (Univ of Missouri), PhD (ibid); Assistant Professor of Animal Science. 2012.

Romans, John S.C.—BS (Iowa State Univ), MA (Univ of Iowa), PhD (Univ of Kansas); Associate Professor of Applied Health and Environmental Psychology. 1990.

Roos, Jason Micah—BA (North Carolina State Univ), M.A. (East Carolina Univ), Ph.D. (Univ. of North Carolina); Assistant Professor of Sociology. 2015

Rosenberger, Albert T.—BA (Whitman College), MS (Univ of Chicago), PhD (Univ of Illinois, Urbana); Professor of Physics. 1995.

Ross, Chris R.—BS (Univ of Missouri), PhD (ibid); Professor of VBS: Physiological Sciences. 2007.

Rossler, Paul E.—BSIE (GMI Engineering and Management Inst), MS (Virginia Polytechnic Inst and State Univ), PhD (ibid); Instructor of Industrial Engineering and Management. 2000.

Roth, Liz —BA (Smith College), MFA (Univ of Wisconsin-Madison); Associate Professor of Art. 2012.

Rouch, Alexander I.—BS (United States Military Academy), M.S. (Univ of Tennessee), Ph.D. (Medical College of Georgia); Associate Professor of CHS: Pharmacology and Physiology. 1992.

Roy Dewesh—BA (Univ of Delhi, India), MA (Delhi School of Economics, India), PhD (Univ of Maryland, College Park); Department of Economics. 2011.

Royer, Tom A.—BS (Iowa State Univ), MS (South Dakota State Univ), PhD (Texas A&M Univ); Associate Professor of Entomology and Plant Pathology. 1997.

Rudloff, Peter Joseph—BA (St. Louis Univ), MA (Univ of Illinois at Urbana-Champaign), PhD (ibid); Assistant Professor of Political Science. 2009.

Ruhl, Donald Dean—BA (Univ of Missouri), PhD (Saint Louis Univ School of Medicine); Assistant Professor of Biochemistry and Molecular Biology 2010.

Ruppert-Stroescu, Mary Susan—BS (Southern Illinois Univ), MS (ibid), MS (Univ of Missouri), PhD (ibid); Assistant Professor of Design, Housing and Merchandising. 2011.

Rusin, Walter M.—BS (Univ of Warsaw), M.S. (Univ of Minnesota), Ph.D. (ibid.); Assistant Professor of Mathematics. 2014.

Russell, Bruce W.—BSCE (Rice Univ), MCE (ibid), PhD (Univ of Texas); Associate Professor of Civil and Environmental Engineering. 2003.

Rutherford, Matthew—BS (Ball State Univ), Ph.D. (Auburn Univ); Associate Professor of Entrepreneurship and Emerging Enterprise. 2015.

Ryan, Bill—BS (Oklahoma State Univ), MS (ibid), Ed.D (ibid); Associate Professor of Hotel and Restaurant Administration. 1981.

Ryet-Lee Ann—BA (Kearney State College), M.Ed (Univ of Nebraska-Lincoln), PhD (ibid); Assistant Professor of Teaching and Curriculum Leadership. 2012.

Sabin, Lee—PhD (Univ of Pittsburgh); Assistant Professor of Educational Studies. 2014.

Sagamore Castillo, Jose Alfredo—BA (Instituto Tecnologico y de Estudios Superiores de Monterrey), M.S. (Oklahoma State Univ), Ph.D. (Universidad Popular Autonoma del Estado de Puebla); Clinical Assistant Professor of Management. 2014.

Sallam, Khaleel A.—BS (Cairo Univ), ME (ibid), MS (Univ of Michigan), PhD (ibid); Associate Professor of Mechanical and Aerospace Engineering. 2003.

Saller, Jeffrey Alan—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Assistant Professor of Agricultural Education. 2009.

Samadzadeh, Mansur H.—BS (Sharif Univ of Tech.), MS (Univ of Louisiana Layfette), PhD (ibid); Professor of Computer Science. 1987.

San, Omer—BS (Istanbul Technical Univ.), M.S. (Old Dominion Univ), Ph.D. (Virginia Tech); Assistant Professor of Mechanical and Aerospace Engineering. 2015.

Sanatuklu-Allison, Elvira—BA (University of Nebraska), MA. (Univ of Nebraska), Ph.D. (ibid.); Associate Professor of Teaching and Curriculum Leadership. 2014.

Sandefur, Gary—BA (University of Oklahoma), PhD (Stanford Univ); Professor of Sociology. 2014.

Sander, Jean Elizabeth—BS (Elmhurst College), MA (Univ of Georgia), DVM (Univ of Wisconsin); Professor of VBS: Pathobiology. 2011.

Sanders, Jennifer Yong—BA (Univ of Florida), MEd (ibid), PhD (ibid); Associate Professor of Teaching and Curriculum Leadership. 2006.

Sanders, Larry D.—BA (Chapman College), MS (New Mexico State Univ), PhD (Colorado State Univ); Professor of Agricultural Economics. 1985.

Sanders, Paula Renee—BS (University of California at Berkeley), MBA (ibid.), Ph.D. (Univ of Illinois at Urbana-Champaign); Assistant Professor of Accounting. 2012.

Sanders, Steven Patrick—BA (Univ of Sciences and Arts of Oklahoma), M.M (Oklahoma City Univ.); Assistant Professor of Music 2013.

Sany, Charles G.—BS (University of Oklahoma), MEd (Univ of Oklahoma); Professor of CHS: Biochemistry and Microbiology. 1995.

Sanyo, Adrienne Redmond—BS (Oklahoma State Univ), MA (Univ of Phoenix), PhD (Oklahoma State Univ); Assistant Professor of Teaching and Curriculum Leadership. 2010.

Santhanakrishnan, Arvind—BE (Bharathidasan Univ), Ph.D. (Univ of Kentucky); Assistant Professor of Mechanical and Aerospace Engineering. 2013.

Sarathy Rathiindra—BE (University of Madras, India), PhD (Texas A&M Univ); Professor of Management Science and Information Systems. 2000.

Sarin, Pankaj—BTech. (Institute of Technology, Banaras Hindu Univ, India), PhD. (Univ of Illinois at Urbana-Champaign); Assistant Professor of Materials Science and Engineering. 2013.

Sayre, Rebecca—Assistant Professor of VBS: Veterinary Clinical Sciences. 2015.

Scarneccia, Dennis L.—BS (University of Arizona), MS (Oregon State Univ), PhD (Colorado State Univ); Department of Natural Resource Ecology and Management. 2011.

Schatzer, Raymond Joe—BS (Univ of Missouri), MS (ibid), PhD (Iowa State Univ); Professor of Agricultural Economics 1983.

Schafer, Matthew—BA (Beloit College), M.A. (Univ of Pennsylvania), Ph.D. (ibid.); Assistant Professor of History. 2015.

Scheets, George M.—BS (United States Military Academy), M.S (Kansas State Univ), PhD (ibid); Associate Professor of Electrical and Computer Engineering. 1987.

Scheets, Kay M.—BS (Panhandle State Univ), PhD (Kansas State Univ); Adjunct Assistant Professor of Botany 1993.

Scheetskat, Karin—BA (Univ of Freiburg, Germany), MA (Univ of New Mexico), PhD (Univ of Southern California); Professor of Foreign Languages and Literature. 1996.

Schick, Laurie Susan—BA (California State Univ, Northridge), MS (Ibid), PhD (Texas Tech Univ); Professor of Horticulture and Landscape Architecture. 1989.

Schoenheck, Gerald—BS (Albert Ludwig Univ), MS (Univ of Osnabruck), PhD (ibid); Associate Professor of Botany 2000.

Schoonover, Michael John—MS (ibid.), DVM (Georgia State Univ); Assistant Professor of VBS: Veterinary Clinical Sciences. 2012.

Schrader, David Charles—BA (Baylor College), MA (Indiana Univ), PhD (ibid); Associate Professor of Psychology 1991.

Schuster, Mike—BS (Univ of Cincinnati), M.A. (Indiana Univ), PhD (ibid); Assistant Professor of Psychology. 1991.

Schweig, Jay—BS (George Mason Univ.); M.S. (Cornell Univ), Ph.D. (ibid.); Assistant Professor of Mathematics. 2013.
Scott, Allen—BM (Samford Univ.), MM (Univ of Alabama), PhD (Florida State Univ); Associate Professor of Music. 1998.

Scott-Halsall, Sheila Ann—BA (Texas Tech Univ.), BS (Univ of Nebraska), MS (Texas Tech Univ), PhD (ibid); Assistant Professor of Hotel and Restaurant Administration. 2006.

Segerman, Henry—M.A. (Univ of Oxford), Ph.D. (Stanford Univ); Assistant Professor of Mathematics. 2014.

Seitinger, Jack Randall—BS (Oklahoma State Univ), MArch (ibid); Professor of Architecture. 1989.

Sel, Mary Jo—BS (Oklahoma State Univ), MS (Univ of Central Oklahoma), EdD (ibid); Associate Professor of Teaching and Curriculum Leadership. 2001.

Senat, Eugene Joseph—BA (Louisiana State Univ), MA (Univ of Memphis), PhD (Univ of North Carolina); Associate Professor of Media and Strategic Communications. 1998.

Shabazz, Demetria R—BA (Univ of Houston), MA (Univ of Alabama), PhD (ibid); Assistant Professor of English. 2014.

Shah, Indal—B.Tech. (Indian Institute of Technology, Bombay), MS (Univ of Cincinnati), PhD (Univ of Notre Dame); Assistant Professor of Chemical Engineering. 2014.

Shan, Yongwei—BE (Chongqing Univ, China), MS (Univ of Kentucky), PhD. (Univ of Colorado at Boulder); Assistant Professor of Cell & Environmental Engineering. 2014.

Sharma, Maneesh K—BS (The Univ of Alabama), PhD (ibid); Assistant Professor of Finance. 2013.

Shaw, Edward L—BS (Georgia Southwestern State Univ), PhD (Univ of South Alabama College of Medicine); Associate Professor of Microbiology and Molecular Genetics. 2004.

Shaw, James H.—BS (Stephen F Austin State College), MFS (Yale Univ), PhD (ibid); Professor of Natural Resource Ecology and Management. 1974.

Shaw, Jennifer H—BS (Florida State Univ), PhD (Univ of Montana); Assistant Professor of Zoology. 2010.

Sheehan, Rebecca A—BS (Purdue Univ), MAG (Southwest Texas State Univ), PhD (Louisiana State Univ); Assistant Professor of Geography. 2006.

Sheeran, Linda R—BS (Western State College), MS (Fort Hays State Univ), EdD (Oklahoma State Univ); Clinical Professor of Human Development and Family Science. 1998.

Shelton, John W—BA (Baylor Univ.), MS (Univ of Illinois), PhD. (ibid); Assistant Professor of Geology. 2012.

Shen, Wenyi—BA (Beijing Normal Univ.), M.A. (ibid.), Ph.D. (In dian a Univ); Assistant Professor of Economics. 2015.

Sheng, Weihua—BS (Zhejiang Univ, China), MS (ibid), PhD (Michigan State Univ); Assistant Professor of Electrical and Computer Engineering. 2006.

Shepherd, Steven—BA (Brock Univ.), Ph.D. (Univ of Waterloo); Assistant Professor of Marketing. 2015.

Shideker, David W—BS (Clemson Univ), MS (Pennsylvania State Univ), PhD (Ohio State Univ); Assistant Professor of Agricultural Economics. 2009.

Shin, Huiyoung—BA (Seoul National Univ of Education), MA (Seoul National Univ), PhD. (Univ of Michigan); Assistant Professor of Applied Health and Educational Psychology. 2014.

Shippka, Danny Gene—BA (Oklahoma State Univ), MS. (ibid), PhD (Univ of Florida); Assistant Professor of Media and Strategic Communications. 2013.

Shoup, Dan E—BS (Miami Univ), MS (Univ of Oklahoma), PhD (Kent State Univ); Associate Professor of Natural Resource Ecology and Management. 2005.

Shreffler, Karina M—BS (Oklahoma State Univ), MA (Pennsylvania State Univ), PhD (ibid); Assistant Professor of Human Development and Family Science. 2007.

Shreffler James William—BS (Ohio State Univ), MS (Louisiana State Univ), PhD (Univ of Florida); Adjunct Assistant Professor of Horticulture and Landscape Architecture. 2001.

Shriver, Lenka Humenikova—BS (Oklahoma State Univ), MS. (ibid), PhD (ibid); Assistant Professor of Nutritional Sciences. 2006.

Shriver, Thomas E.—BA (Western Kentucky Univ), MA (Univ of Tennessee), PhD (ibid); Professor of Sociology. 1995.

Shufan, Kevin A—BS (Purdue Univ), MS (Univ of Kentucky), PhD (Kansas State Univ); Adjunct Assistant Professor of Entomology and Plant Pathology. 1998.

Shull, Jr., Peter Otto—BA (Princeton Univ), MS (Rice Univ), PhD (ibid); Associate Professor of Physics. 1984.

Siddons, Louise Elizabeth—BA (Cornell Univ), AM (Stanford Univ), PhD (ibid); Associate Professor of Art. 2010.

Sinkins, Betty Jo—BS (Univ of Arkansas), MBA (Oklahoma State Univ), PhD (Case Western Reserve Univ); Professor of Finance. 1997.

Simms, Alexander Ray—BS (Oklahoma State Univ), PhD (Rice Univ); Assistant Professor of Geology. 2005.

Simpson, William Gary—BA (Texas Tech Univ), MBA (Southern Methodist Univ), PhD (Texas A&M Univ); Professor of Finance. 1978.

Singh, Raj N—Indian Inst. of Technology, B. Tech.; DSc (Massachusetts Institute of Technology); Professor of Materials Science and Engineering. 2012.

Singh, Raman Pal—B.Tech (Indian Institute of Technology, Kanpur), MS (Univ of Rhode Island), PhD (ibid); Professor of Materials Science and Engineering. 2006.

Sippel, Kate—Assistant Professor of VBS; Veterinary Clinical Sciences. 2015.

Sittner, Kelley J—BS (Univ of Nebraska-Lincoln), M.A. (ibid.), Ph.D. (ibid.); Assistant Professor of Sociology. 2012.

Sitton, Shelly Ruth—BS (Oklahoma State Univ), MS (ibid), PhD, (ibid); Professor of Agricultural Education. 1992.

Skinner, Cathleen L.—BA (Oral Roberts Univ), MA (Oklahoma State Univ), PhD (ibid); Visiting Assistant Professor of Teaching and Curriculum Leadership. 2011.

Shrivastava, Elissaveta Elis—BS (St Petersburg Univ of Finance & Commerce, St Petersburg, Russia), MBA (Iowa State Univ), PhD (ibid); Associate Professor of Hotel and Restaurant Administration. 2008.

Smy, James Earl—BS (Oklahoma State Univ), PhD (Univ of Illinois at Urbana-Champaign); Associate Professor of Materials Science and Engineering. 2002.

Smith, Alexis N—BS (Rice Univ), PhD (Tulane Univ); Assistant Professor of Management. 2012.

Smith, Brenda Jane—BS (Oklahoma Baptist Univ), MS (Univ of Texas at Tyler), PhD (Oklahoma State Univ); Professor of Nutritional Sciences. 2002.

Smith, Damon L—BS (State Univ of New York), MS (North Carolina State Univ), PhD (ibid); Assistant Professor of Entomology and Plant Pathology. 2008.

Smith, Douglas Boyd—BS (Univ of Nebraska), MS (Univ of Nevada, Las Vegas), PhD (Univ of Nebraska); Associate Professor of Applied Health and Educational Psychology. 2002.

Smith, Kent S.—BS (Cameron Univ), MS (Midwestern State Univ), PhD (Univ of Oklahoma); Associate Professor of CHS; Anatomy and Cell Biology. 2003.

Smith, Lindsey Claire—BA (Hendrix College), MA (Univ of North Carolina), PhD (ibid); Assistant Professor of English. 2006.

Smith, Loren Michael—BS (Truman State Univ), MS (South Dakota State Univ), PhD (Utah State Univ); Regents Professor of Zoology. 2007.

Smith, Michael Myrie—BA (Southern Illinois Univ), MA (ibid), PhD (Texas Christian Univ); Professor of History. 1970.

Smith, Michael Wayne—BS (Oklahoma State Univ), MS (ibid), PhD (Michigan State Univ); Regents Service Professor of Horticulture and Landscape Architecture. 1977.

Smidler, Timothy A—BS (Oklahoma State Univ), DVM (ibid), PhD (ibid); Associate Professor of Veterinary Pathology. 2009.

Soliah, Lu Ann—BS (North Dakota State Univ), MS (Kansas State Univ), PhD (Oklahoma State Univ); Visiting Professor of Nutritional Sciences. 2012.

Soliman, Mohamed—BSc. (Alexandria Univ, Egypt), M.Sc. (ibid), Ph.D. (Lehigh Univ); Assistant Professor of Civil & Environmental Engineering. 2015.

Solomon, Benjamin George—BA (Muhlenberg College), MED (Univ of Massachusetts), PhD (ibid); Assistant Professor of Applied Health and Educational Psychology. 2011.

Somerville, Ian R—BS (The Queens Univ of Belfast), PhD (ibid); Adjunct Professor of Geology. 2007.

Soni, J. Hoon—BA (Han Yang Univ), MS (Pennsylvania State Univ), PhD (ibid); Assistant Professor of Teaching and Curriculum Leadership. 2009.

Soule, Joseph L—BS (Univ Nacional de la Plata), PhD (ibid); Associate Professor of Biochemistry and Molecular Biology. 1999.

Spalding, Shannon—BA (Texas Tech Univ), MA (Univ of Arkansas), PhD (Univ of Wisconsin-Madison); Assistant Professor of Philosophy. 2012.

Spector Tom—BS (Florida State Univ), MArch (Georgia Tech), PhD (Univ of California, Berkeley); Associate Professor of Architecture. 2003.

Sped, George Maurice—BM (Vanderbilt Univ), MS (Baton Univ); Associate Professor of Music. 2005.

Spencer, Angela Wheeler—BS (Univ of the Ozarks), MS (Univ of Central Arkansas), PhD (Univ of Arkansas); Assistant Professor of Accounting. 2006.

Spicer, Leon J—BS (Univ of Minnesota), MS (Univ of Idaho), PhD (Michigan State Univ); Professor of Animal Science. 1988.
Swinney, Jane L.—BS (Colorado State Univ), MS (Iowa State Univ), PhD (Oklahoma State Univ); Professor of Geography. 1980.

Stadler, Stephen John—BS (Miami Univ), MA (ibid), PhD (Indiana State Univ); Assistant Professor of Human Development and Family Science. 2009.

Stansberry, Susan L.—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Associate Professor of Educational Studies. 2002.

Steelman, Zachary Raymond—BBA (Northeastern State Univ), MS (Univ of Arkansas); Assistant Professor of Management Science and Information Systems. 2014.

Steets, Janette Ann—BS (Muhlenberg College), PhD (Univ of Pittsburgh); Assistant Professor of Botany. 2007.

Stein, Daniel R.—BS (Northwestern Oklahoma State Univ), MS (Oklahoma State Univ), PhD (ibid); Assistant Professor of Animal Science. 2010.

Step, D.L.—DVM (Univ of Illinois); Professor of VBS: Veterinary Clinical Sciences. 2005.

Stern, A. Kenneth—BA (Messiah College), MEd (Shippensburg Univ), EdD (Univ of Oklahoma); Associate Professor Emeritus of Educational Studies. 1980.

Stevens, Craig W.—BA (Augustana College), MS (Univ of Illinois, Chicago), PhD (Mayo Clinic); Professor of CHS: Pharmacology and Physiology. 1990.

Stevens, Vivian M.—BS (Montclair State College), PhD (Univ of Health Science/Chicago Med School); Professor of CHS: Psychiatry and Behavioral Sciences. 1986.

Stewart, Gary E.—BS (Oklahoma State Univ), MS (Univ of Oklahoma), Ph.D. (Univ. of Kansas); Professor Emeritus of Geology. 1971.

Stine, James Edward—AB (Acadia University), MS (Univ of Bridgeport), PhD (Lehigh Univ); Associate Professor of Electrical and Computer Engineering. 2005.

Stimnett, Terry A.—BS (Univ of Southern Missisippi); Professor of Applied Health and Educational Psychology. 1995.

Stoecker, Arthur Louis—BS (Kansas State Univ), MS (Northeast Louisiana Univ), PhD (Univ of Southern Missisippi); Professor of Applied Health and Educational Psychology. 1987.

Stoecker, Barbara J.—BS (Kansas State Univ), PhD (Iowa State Univ); Regents Professor of Nutritional Sciences. 1987.

Stone, Thomas H.—BA (Univ of Michigan), MA (Univ of Minnesota), PhD (ibid); Professor of Management. 1989.

Stoodley, Scott H.—BS (West Virginia Univ), MS (Baylor Univ), PhD (Oklahoma State University); Professor Emeritus of Geology. 1971.

Stovall, Daniel Eugene—BS (Virginia Tech Univ), MS (ibid), PhD (Univ of Kentucky); Professor of Biosystems and Agricultural Engineering. 1990.

Stovy, Chandra R.—BS (The Univ of Tennessee, Knoxville), MS (Boise State Univ.), PhD. (The Univ. of Tennessee, Knoxville); Assistant Professor of Applied Health and Educational Psychology. 2012.

Stover, Ted Raas—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Assistant Professor of Biosystems & Agricultural Engineering. 2013.

Streeter, Robert N.—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Assistant Professor of Environmental Sciences. 2011.

Stroope, Z. Randall—BME (Oral Roberts Univ), MM (Univ of Colorado), DMA (Arizona State Univ); Associate Professor of Music. 2009.

Su, Rensheng—BS (Tsinghua Univ, China), MS (China Agricultural Univ), PhD (Kansas State Univ.), Research Assistant Professor of Horticulture & Landscape Architecture. 2014

Sukhail, Ajay Singh—BS (State Stephens College), MBA (Wake Forest Univ), PhD (Univ of Oregon); Associate Professor of Marketing. 1988.

Sullivant, Maureen A.—BS (Texas A&M Univ), MA (State Univ of New York at Stony Brook), PhD (ibid); Associate Professor of Psychology. 1990.

Summy, Gil—BS (Univ of Queensland), BS (Griffith Univ), PhD (ibid); Assistant Professor of Physics. 2002.

Sunkar, Ramanjulu—MPhil (Sri Krishnadevaraya Univ), MSc (ibid), PhD (ibid); Associate Professor of Biochemistry and Molecular Biology. 2006.

Suter, Tracy A.—BS (Wichita State Univ), MBA (Univ of Arkansas), PhD (ibid); Associate Professor of Marketing. 2001.

Swim, Leva K.—BS (Oklahoma State Univ), MS (ibid), PhD (Univ of Oklahoma); Lecturer of Industrial Engineering and Management. 2009.

Swiney, Jane L.—BS (Colorado State Univ), MS (Iowa State Univ), PhD (Oklahoma State Univ); Associate Professor of Design, Housing and Merchandising. 2004.

Tadege, Million—BS (Addis Ababa Univ); MSc (Wageningen Agricultural Univ), PhD (Univ of Bern); Associate Professor of Plant and Soil Sciences. 2016.

Taghvaeian, Saleh—BS ( Ferdowsi Univ, Iran), M.S. (ibid,), Ph.D. (Utah State Univ); Assistant Professor of Biosystems & Agricultural Engineering. 2014.

Taghvaeian, Saleh—BS ( Ferdowsi Univ, Iran), M.S. (ibid,), Ph.D. (Utah State Univ); Assistant Professor of Biosystems & Agricultural Engineering. 2015.

Tahsin, Lealeh—BS (Azarbaijan Univ, Iran), MSc (Sharif Univ of Technology, Iran), PhD (ibid.); Assistant Professor of Chemistry. 2014.

Takacs, Stacy Lynn—BA (Northwestern Univ), MA (Indiana Univ), PhD (ibid); Associate Professor of English. 2002.

Talbott, Laura—BM (Vanderbilt Univ), MM (Univ of Michigan), DMA (Boston Univ); Associate Professor of Music. 2004.

Talley, Justin Lee—BS (West Texas A&M Univ), Ms (ibid), PhD (Kansas State Univ); Assistant Professor of Entomology and Plant Pathology. 2011.

Tapp, Tyler Nicholas—BS (Northwest Missouri State Univ), MS (ibid), PhD (Oklahoma State Univ); Assistant Professor of Applied Health and Educational Psychology. 2010.

Tate, Amy Halliburton—BS (Vanderbilt Univ), MA (Univ of Virginia), PhD (Univ of Missouri); Assistant Professor of Human Development & Family Science. 2005.

Tayebi, Lobat—BS (Sharif Univ of Technology), MS (McMaster Univ), PhD (Univ of California, Davis); Assistant Professor of Materials Science and Engineering. 2011.

Taylor, Jared D.—MPH (Univ of Iowa), DVM (Virginia Marylnd Regional College of Veterinary Medicine), PhD (Kansas State Univ); Assistant Professor of VBS: Pathobiology. 2010.

Taylor, Merritt Jefferson—BS (New Mexico State Univ), MS (ibid), PhD (Texas A&M Univ); Professor of Agricultural Economics. 2010.

Taylor, Michael Reed—BSEd (Bowling Green State Univ), MA (ibid), PhD (Florida State Univ); Associate Professor of Philosophy. 1984.

Taylor, Randall Kevin—BS (Oklahoma State Univ), MS (ibid), PhD (Univ of Nebraska); Professor of Biosystems and Agricultural Engineering. 2005.

Taylor, Robert Michael—BS (ibid.), MS (ibid.), PhD (ibid); Research Professor of Mechanical and Aerospace Engineering. 2011.

Te Velde, John R.—BA (Dordt College), BA (Western Washington Univ), MA (Middlebury College), PhD (Univ of Washington); Professor of Foreign Languages and Literature. 1991.

Teague, Keith A.—BSEE (Oklahoma State Univ), MSEE (ibid), PhD (ibid); Professor of Electrical and Computer Engineering. 1988, 1983.

Toft, Donita R.—BS (Oklahoma State Univ) MA (ibid); Instructor of Communication Sciences and Disorders. 2011.

Tohguakula, Narasuna—BS (Sri Krishnadevaraya Univ, India), MS (Sri Venkateshwara Univ, India), PhD (Omania Univ India); Research Assistant Professor of VBS: Physiological Sciences. 2011.

Tentorio, Lucero—BA (Universidad del Valle, Colombia), MA (Purdue Univ), MS (Universidad del Valle, Colombia), PhD (Purdue Univ); Associate Professor of Foreign Languages and Literature. 2010.

Terry, H. Robert, Jr.—BS (ibid), MS (ibid), PhD (Texas A&M Univ); Professor of Agricultural Education. 2011.

Thomas, Daniel L.—BS (Louisiana State Univ), ME (ibid), PhD (Purdue Univ); Professor of Biosystems and Agricultural Engineering. 2011.

Thomas, David Gethin—BA (Albion College), MA (Univ of Denver), PhD (ibid); Professor of Foreign Languages and Literature. 2011.

Terry, H. Robert, Jr.—BS (ibid), MS (ibid), PhD (Texas A&M Univ); Professor of Agricultural Education. 2011.

Tilly, Daniel Stephen—BA (Iowa State Univ), MS (ibid), PhD (ibid); Professor of Agricultural Economics. 1982.

Topham, Glade LeGrand—BS (Brigham Young Univ). MS (ibid), PhD (Texas Tech Univ); Associate Professor of Human Development and Family Science. 2003.
Vitals, Jeffrey Dunn—BS (Purdue Univ.), MS (ibid.), PhD (ibid.); Assistant Professor of Agricultural Economics. 2006.

Vogel, Jason Robert—BS (Univ of Nebraska), MS (Texas A&M Univ.), PhD (Oklahoma State Univ); Associate Professor of Biosystems and Agricultural Engineering. 2010.

Vogler Cragun, Jane Susan—BA (Univ. of Northern Iowa), MED (Wichita State Univ.), PhD (Univ of Texas at Austin); Assistant Professor of Applied Health and Educational Psychology. 2013.

Volberding, Jennifer L.—BS (Boston Univ.), MS (Georgia State Univ.), PhD (Univ of Kansas); Assistant Professor of Applied Health and Educational Psychology. 2010.

Vora, Hitesh D.—BE (Univ of Mumbai, India), MS (Univ. of North Texas), PhD (ibid.); Assistant Professor of Mechanical and Aerospace Engineering. 2015

Vos, Kevin E.—BS (Washington State Univ.), MS (ibid.), PhD (ibid.); Associate Professor of Marketing. 2001.

Wadowski, Andrew Marc—BS (St. Lawrence Univ.), MA (Univ of Rochester), PhD (ibid.); Assistant Professor of English. 2010.

Wagner, Jarrod—BS (Univ of California, Irvine), PhD (ibid.); Associate Professor of CHS: Forensic Sciences. 2007.

Walker, Jeffrey Brian—BA (Shippensburg State College), MA (Middlebury College), PhD (Pennsylvania State Univ); Professor of English. 1981.

Walker, Nathan R.—BA (Bloomington Univ.), MS (Clemson Univ), PhD (Univ of Arkansas); Associate Professor of Entomology and Plant Pathology. 1999.

Wall, Corey—D.V.M. (Colorado State Univ); Assistant Professor of VBS: Veterinary Clinical Sciences. 2014

Wallace, David R.—BS (Western Michigan Univ), PhD (Univ of Florida); Professor of CHS: Pharmacology and Physiology. 1996.

Wallace, Julian Craig—BS (Univ of Tennessee at Chattanooga), MA (Univ of West Florida), PhD (Georgia Institute of Technology); Associate Professor of Management. 2006.

Waller, Mark—BS (Northeastern Normal Univ, China), MA (East China Normal Univ), PhD (Louisiana State Univ); Associate Professor of Teaching and Curriculum Leadership. 2001.

Wang, Kelvin C.P.—BS (Southwest Jiaotong Univ, China), MS (Beijing Jiaotong Univ), PhD (Louisiana State Univ); Associate Professor of Teaching and Curriculum Leadership. 2011.

Wang, Ning—BS (Beijing Agricultural Engineering Univ), MS (Asian Institute of Technology), PhD (Kansai State Univ); Assistant Professor of Biosystems and Agricultural Engineering. 2007.

Wang, Qingsheng—BS (Zhejiang Univ, China), MS (ibid.), PhD (Texas A&M Univ); Associate Professor of Chemical Engineering. 2011.

Wang, Qiuying—BA (Harbin Normal Univ, China), MA (Nottingham Univ), PhD (Univ of Illinois); Associate Professor of Teaching and Curriculum Leadership. 2005.

Wang, Shuaodao—B.E. (Tsinghua Univ, China), Ph.D. ( Northwestern Univ); Assistant Professor of Mechanical and Aerospace Engineering. 2014.

Wang, Yanqi—BS (Pudan Univ), MS (ibid.), PhD (Texas A&M Univ); Assistant Professor of Mathematics. 2007.

Wanger, Stephen Paul—BA (Oral Roberts Univ), MDiv (Duke Univ), PhD (Purdue Univ); Assistant Professor of Educational Studies. 2006.

Warren, Aric Jon—BS (Univ of Nebraska), MS (Michigan State Univ), EEd (DePaul Univ); Associate Professor of Applied Health and Educational Psychology. 2005.

Warren, Jason G.—BS (Northwestern State Univ, Louisiana), MS (oklahoma State Univ), PhD (ibid); Associate Professor of Applied Health and Educational Psychology. 2011.

Washburn, Isaac Joel—BS (Brigham Young Univ.), MS (Oregon State Univ), PhD (ibid.); Assistant Professor of Human Development & Family Science. 2014.

Watson, Linda E.—BS (Louisiana State Univ), PhD (Univ of Oklahoma); Professor of Botany. 2009.

Watters, Craig Emory—BA (Louisiana State Univ), MS (ibid.), PhD (ibid.); Associate Professor of Entrepreneurship and Emerging Enterprise. 2011.

Wayandade, Astric C.—BS (Univ of California), MS (Univ of Missouri, Columbia), PhD (Ohio State Univ); Associate Professor of Entomology and Plant Pathology. 1997.
Weaver, Jimmie Dean—BS (Southern Nazarene Univ.), PhD (Univ. of Kansas); Assistant Professor of Chemistry. 2012.

Weckler, Paul R.—BS (California Polytechnic State Univ), MS (Utah State Univ), PhD (Oklahoma State Univ); Associate Professor of Biosystems and Agricultural Engineering. 2002.

Weeks, Penny Pennington—BS (Texas A&M Univ), MS (ibid), PhD (ibid); Associate Professor of Agricultural Education. 2001.

Weeks, William Gerard—BS (Illinois State Univ), MS (Univ of Illinois), PhD (Texas A&M Univ); Professor of Agricultural Education. 1989.

Weil, Anne L.—AB (Harvard Univ), MA (Univ of Texas at Austin), PhD (Univ of California, Berkeley); Associate Professor of CHS: Anatomy and Cell Biology. 2006.

Weiner, Christopher Brian—BA (Colgate Univ), MA (Miami Univ of Ohio), PhD (Pennsylvania State Univ); Professor of Foreign Languages and Literature. 2007.

Wellert, Charles Scott—BS (Univ of Michigan), MS (Univ of Chicago), PhD (Northwestern Univ); Associate Professor of Chemistry. 2004.

Weiser, Mark—BS (Pennsylvania State Univ), PhD (Univ of Iowa); Associate Professor of Management Science and Information Systems. 1995.

Welch, Ginger Lea—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Clinical Associate Professor of Human Development & Family Science. 2013.

Wells, Tony Terry—BA (Univ of Texas at Austin), MA (Univ of Pennsylvania), PhD (Univ of Texas at Austin); Assistant Professor of Psychology. 2012.

Wen, Jun—BS (Central China Agricultural Univ), PhD (Ohio State Univ); Adjunct Professor of Botany. 2013.

West, James C.—BSEE (Univ of Oklahoma), MSE (Univ of Kansas), PhD (ibid); Professor of Electrical and Computer Engineering. 1989.

Westervhoff, Benjamin Peter—BA (Wittenburg Univ), MFA (Univ of Connecticut); Professor of Theatre. 1985.

Wetttemann, Robert Paul—BS (Univ of Connecticut), MS (Michigan State Univ), PhD (ibid); Regents Professor of Animal Science. 1972.

Wheel, Denna L.—BS (Univ of Oklahoma), ME (Univ of Arkansas), PhD (Oklahoma State Univ); Adjunct Assistant Professor of Educational Studies. 2009.

Whitacre, Brian E.—BS (Univ of Mary Washington), MS (Virginia Tech), PhD (ibid); Associate Professor of Agricultural Economics. 2006.

White, Jeffery L.—BS (Stephen F. Austin State Univ), PhD (Texas A&M); Associate Professor of Agricultural Economics. 2011.

Whiteley, James Robert—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Associate Professor of Agricultural Engineering. 2002.

White, Scott D.—Ph.D. (Univ. of Missouri - Columbia); Assistant Professor of Accounting. 2014

Whiteley, James Robert—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Professor of Chemical Engineering. 1995.

Whitlam, Monica—BA (Simpson College), BS (Iowa State Univ), MS (ibid), PhD (Univ of Arizona); Assistant Professor of Sociology. 2014.

Wiener, Joshua Lyle—BA (Hiram), PhD (Univ of North Carolina); Assistant Professor of Psychology. 2014

Wilde, Gregory G.—BA (Hastings College), MS (Univ of Iowa), PhD (ibid); Associate Professor of Civil and Environmental Engineering. 1991.

Wilder, Shawn—BA (Bradford College), M.S. (Miami Univ), Ph.D. (ibid); Assistant Professor of Zoology. 2014.

Wilkins, Mark Robert—BS (Purdue Univ), MS (Univ of Illinois at Urbana-Champaign), PhD (ibid); Associate Professor of Biosystems and Agricultural Engineering. 2005.

Will, Rodney Edward—BS (Cornell Univ), MS (Virginia Technical Univ), PhD (Univ of Georgia); Associate Professor of Natural Resource Ecology and Management. 2005.

Willett, Keith D.—BS (Nebraska Wesleyan Univ), MS (Univ of Nebraska at Omaha), PhD (Univ of New Mexico); Regents Service Professor of Economics. 1981.

William, Elizabeth A.—BA (Univ of Oklahoma), MA (Univ of Oregon), PhD (Indiana Univ); Professor of History. 1986.

Williams, Sue E.—BS (New Mexico State Univ), MA (Iowa State Univ), PhD (Oklahoma State Univ); Professor Emeritus of Human Development and Family Science. 1977.

Williamson, Amy—BS (Univ of Oklahoma), M.Ed. (ibid), Ph.D. (Univ of North Carolina at Greensboro); Assistant Professor of Human Development & Family Science. 2015.

Wilson, Blake Kegonsa—BS (Oklahoma State Univ), MS (ibid), PhD (ibid); Assistant Professor of Animal Science. 2015.

Wilson, Blake—BS (Oklahoma State Univ), M.S. (ibid), Ph.D. (ibid); Assistant Professor of Animal Science. 2015.

Wilson, Duncan S.—BS (Univ of Washington), MS (Univ of Maine), PhD (Oregon State Univ); Assistant Professor of Natural Resource Ecology and Management. 2010.

Wilson, Gail W.T.—BS (Mercyhurst College), MS (Slippery Rock State Univ), PhD (Kansas State Univ); Associate Professor of Natural Resource Ecology and Management. 2007.

Wilson, Jeff D.—BS (Edinboro State Univ), MS (Slippery Rock State Univ), PhD (Kansas State Univ); Assistant Professor of Natural Resource Ecology and Management. 2013.

Wilson, Kevin Scott—BS (Univ of Arizona), PhD (Univ of Oregon); Assistant Professor of Biochemistry and Molecular Biology. 2011.

Wilson, Nedra Fay—BS (Northeastern Oklahoma State Univ), PhD (Univ of Texas Southwestern Graduate School); Associate Professor of CHS: Anatomy and Cell Biology. 2006.

Wilson, Rick L.—BS (Univ of Nebraska), MS (Creighton Univ), PhD (Univ of Nebraska); Professor of Management Science and Information Systems. 1990.

Wingate, LaRlcka Rosalyn—BS (Florida State Univ), MS (ibid), PhD (ibid); Assistant Professor of Psychology. 2006.

Winterwood, Carole L.—BA (Univ of Missouri, Columbia), MS (Univ of Kansas), PhD (ibid); Associate Professor of Applied Health and Educational Psychology. 1994.

Winters, John V.—BA (Mississippi State Univ), MS (Georgia State Univ), PhD (ibid); Assistant Professor of Economics. 2013.

Witte, Shellee Dee Ann—BS (Univ of Oklahoma), M.S. (Kansas State Univ), PhD (ibid); Associate Professor of Teaching and Curriculum Leadership. 2015.

Wolfgang, Mark A.—BA (Western Michigan Univ), MS (Univ of Toronto), PhD (Univ of Wisconsin); Assistant Professor of Political Science. 2005.

Wollenberg, Gene Suela—BS (Oklahoma State Univ), MS (ibid), Ph.D. (ibid); Clinical Assistant Professor of Nutritional Sciences. 2015.

Womack, John Calvin—BA (Univ of Arkansas), BArch (ibid), MArch (Oklahoma State Univ); Professor of Architecture. 1999.

Woods, Michael D.—BS (Arkansas Tech Univ), MS (Univ of Arkansas), PhD (Oklahoma State Univ); Professor of Agricultural Economics. 1986.

Woolsey, Conrad L.—BS (Northwest Missouri State Univ), ME (Univ of Missouri), PhD (ibid); Assistant Professor of Applied Health and Educational Psychology. 2009.

Worley, Virginia Ann—BA (College of Great Falls), MA (State Univ of New York, Buffalo), PhD (Univ of Oklahoma); Professor of Teaching and Curriculum Leadership. 2001.

Wright, Charlotte L.—BBA (Univ of Texas-Arlington), MPA (ibid), PhD (North Texas State Univ); Professor of Accounting. 1982.

Wright, David J.—BA (Cornell Univ), MA (Harvard Univ), PhD (ibid); Professor of Mathematics. 1985.

Wroldsen, Jack—BA (Univ of Arizona), M.Ed. (ibid.), J.D. (Duke Univ); Assistant Professor of Economics. 2014.

Wu, Hao Che Tristan—BA (Chinese Culture Univ, Taiwan), MA (Ming Chuan Univ., Taiwan), PhD (Texas A&M Univ); Assistant Professor of Political Science. 2014.

Wu, Jiahong—BS (Beijing Univ), MS (ibid), PhD (Univ of Chicago); Associate Professor of Mathematics. 2000.

Wu, Yanqi—BSc (Ningxia Agricultural College), MSc (Sichuan Agricultural Univ), PhD (Oklahoma State Univ); Associate Professor of Plant and Soil Sciences. 2006.

Wyman, Randy S.—BS (Univ of California, Davis), PhD. (Univ of California,Irvine); Associate Professor of CHS: Pharmacology and Physiology. 2004.

Xie, Alhua—BS (Zhejiang Univ), MS (Carnegie Mellon Univ), PhD (ibid); Professor of Physics. 1997.

Yan, Lu—BS, (Yangtai Univ China), MSc (ibid), PhD (Victoria Univ); Associate Professor of Plant and Soil Sciences. 2006.

Yan, Shu—BS (Nankai Univ, China), Ph.D. (Univ of California at San Diego), Ph.D. (Univ of California Los Angeles); Assistant Professor of Finance. 2014.

Yang, Ming—BS (Beijing Univ), MS (Chinese Academy of Sciences), PhD (Ohio State Univ); Associate Professor of Biological Sciences. 2011.

Yang, Jing—BA (China Foreign Affairs Univ), MA (Oklahoma State Univ), MS (ibid), PhD (ibid); Assistant Professor of Applied Health and Educational Psychology. 2009.

Yang, Yan—BS (Zhejiang Univ), MS (ibid), PhD (Univ of Kansas); Assistant Professor of Biological Sciences. 2011.

Yates, Heather Noelle—BS (ibid), ME (Pittsburg State Univ), EdD (ibid); Associate Professor of Engineering Technology Division. 2013.
Yen, Gary G.—BS (Nat'l Taipei Institute of Technology, Taiwan), MS (Marquette Univ.), PhD (Univ of Notre Dame); Professor of Electrical and Computer Engineering. 1996.
Yetter, Georgette Protanides—BS (Dickinson College), MS (Villanova Univ.), PhD (Univ of Nebraska); Associate Professor of Applied Health and Educational Psychology. 2005.
Young, Jeffrey L.—BS (Ohio Northern Univ.), M.S. (Univ. of Arizona), Ph.D. (ibid.); Professor of Electrical & Computer Engineering. 2015.
Yousefian, Farzad—BS (Sharif Univ. of Technology, Iran), M.S. (ibid.), Ph.D. (Univ. of Illinois, Urbana-Champaign); Assistant Professor of Industrial Engineering and Management. 2015.
Yousef, Noha H.—BS (Al Shams Univ., Egypt), PhD (Univ of Oklahoma); Assistant Professor of Molecular & Microbial Genetics. 2013.
Yu, Hongbo—BS (Peking Univ.), MS (The Chinese Univ of Hong Kong), PhD (Univ of Tennessee); Associate Professor of Geography. 2005.
Yukihara, Eduardo GardenaI—BS (Univ of Sao Paulo), PhD (ibid.); Associate Professor of Physics. 2004.
Zahl, Melissa—BS (Univ of North Dakota), M.S. (Univ of Utah), Ph.D. (ibid.); Assistant Professor of Applied Health and Educational Psychology. 2014.
Zarrabi, Ali A.—BS (Hamadan Agricultural College), MS (Oklahoma State Univ), PhD (ibid); Research Assistant, Entomology & Plant Pathology. 2013.
Zhang, Bo—BS (Huazhong Univ. of Science & Technology, China), BS (ibid.), M.S. (ibid.), Ph.D. (Univ of Florida); Assistant Professor of Horticulture & Landscape Architecture. 2015.
Zhang, Guodong Glenn—BS (China Agricultural Univ), MS (ibid.), PhD (Kansas State Univ); Associate Professor of Animal Science. 2002.
Zhang, Hailin—BS (Nanjing Agricultural Univ, China), MS (Iowa State Univ), PhD (Nanjing Agricultural Univ, China); Regents Professor of Plant and Soil Sciences. 1984.
Zhang, Jun—BS (Wuhan Univ. of Technology, China), M.S. (ibid.), Ph.D. (Texas A&M Univ), Ph.D. (Institute of Physics, Chinese Academy of Sciences); Assistant Professor of Finance. 2014.
Zhang, Shaqian—BA (Beijing Univ, China), MA (Northwestern Univ), PhD (ibid.); Assistant Professor of Art. 2011.
Zhang, Wei—BS (Tianjin Univ, China), MS (ibid.), PhD (ibid); Professor of Electrical and Computer Engineering. 2002.
Zha, Chaoyue Charlene—BS (Fudan Univ, China), PhD (Florida); Assistant Professor of Industrial Engineering and Management. 2014.
Zhao, Guoping—BE (Shasekai Institute of Mechanical Engineering), MA (ibid.), Ph.D (Univ of Virginia); Associate Professor of Educational Studies. 2002.
Zhonghua H.—BS (Peking Univ), MS (College of William and Mary), PhD (ibid.); Associate Professor of Physics. 2009.
Zhu, Lan—BS (Peking Univ), MS (Cornell Univ), PhD (ibid.); Associate Professor of Statistics. 2007.
Zierau, Roger C.—BS (Trinity College), PhD (Univ of California, Berkeley); Professor of Mathematics. 1988.
Zou, Chris Bocai—BS (Southwest Univ, China), MS (ibid.), PhD (Univ of Canterbury New Zealand); Assistant Professor of Natural Resource Ecology and Management. 2009.

Emeriti Members

Adolphson, Alan C.—BA (Western Washington Univ), PhD (Princeton Univ); Regents Professor Emeritus of Mathematics. 1983.
Anderson, Kim Barry—BS (Oklahoma State Univ), M.S. (ibid.), Ph.D. (ibid.); Professor Emeritus of Agricultural Economics. 1982.
Auszum, Lynn Jacey—BS (Univ of Tulsa), M.A. (ibid.), Ph.D. (Univ of Oklahoma); Associate Professor Emeritus of Teaching and Curriculum Leadership. 2000.
Banks, J.C.—BS (Oklahoma State Univ), MS (ibid.), Ph.D. (ibid.); Professor Emeritus of Plant and Soil Sciences. 1988.
Barbier, Kenneth N.—BS (Colorado State Univ), D.V.M. (Iowa State Univ); Professor Emeritus of VBS; Veterinary Clinical Sciences. 1982.
Bauer, Carolyn June—BS (Oklahoma State Univ), MS (ibid.), Ed.D (ibid.); Professor Emeritus of Teaching and Curriculum Leadership. 1966.
Beer, Ronald S.—BS (Illinois State Univ); MA (Michigan State Univ), PhD (Kent State Univ); Professor of Educational Studies. 1980.
Bender, Carol L.—BS (Texas Tech Univ), M.S. (Oregon State Univ), Ph.D (Univ of California); Regents Professor Emeritus of Entomology & Plant Pathology 1986.
Bender, Gary R.—BS (Cornell Univ), MS (ibid.), PhD (Ohio State Univ); Professor Emeritus of Teaching and Curriculum Leadership. 1985.
Boswell, Donald L.—BA (Univ of Central Florida), M.S. (Indiana State Univ), Ph.D. (ibid.); Associate Professor Emeritus of Applied Health and Educational Psychology. 1991.
Brown, Anthony Edward—BA (Baylor Univ), M.P.A. (Univ. of Tennessee), Ph.D. (ibid.); Regents Service Professor Emeritus of Political Science. 1980.
Buchanan, David S.—BS (North Dakota State Univ), MS (Univ of Nebraska), PhD (ibid.); Professor Emeritus of An Animal Science. 1980.
Byrnes, Joseph F.—BA (De Montfort Seminary), M.A. (Univ. of Notre Dame), Ph.D. (Univ of Chicago); Professor Emeritus of History. 1976.
Campbell, Noma Jo—BS (Oklahoma State Univ), MS (Kansas State Univ), EdD (Virginia Polytechnic Institute and State Univ); Professor of Educational Studies. 1975.
Cannedy, Lowell M.—BA (LeTourneau College), MA (Univ of Wyoming), Ph.D. (Univ of Minnesota); Regents Professor Emeritus of Applied Health and Educational Psychology. 1981.

Carter Sally A.—BS (Arkansas Technical Univ), MEd (ibid.), EdS (ibid.), EdD (ibid.); Associate Professor Emeritus of Teaching and Curriculum Leadership. 1990.
Cartinouch John W.—BS (Univ of Arkansas-Little Rock), MS (Oklahoma State Univ), Ph.D. (ibid.); Associate Professor Emeritus of Engineering Technology Division. 1987.
Castle, Kathryn—BA (Univ of Oklahoma), MA (Emory Univ), EdD. (Univ of Virginia); Professor Emeritus of Teaching and Curriculum Leadership. 1975.
Chandler, John P.—BS (Lehigh Univ), MS (Indiana Univ.), Ph.D (ibid.); Professor Emeritus of Computer Science. 1970.
Choi, James Richard—BS (Univ of Detroit), M.S. (Purdue Univ), Ph.D. (Wayne State Univ); Professor Emeritus of Mathematics. 1970.
Conway, Kenneth E.—BA (State Univ of New York College, Potsdam), MS (State Univ of New York College, Syracuse), PhD (Univ of Florida); Professor Emeritus of Entomology & Plant Pathology. 1978.
Criswell, Jim T.—BS (Oklahoma State Univ), MS (ibid.), PhD (ibid); Professor Emeritus of Entomology & Plant Pathology. 1988.
Dicks, Michael R.—BS (California Polytechnic State Univ), MS (Univ of Missouri at Columbia), Ph.D. (ibid.); Professor Emeritus of Agricultural Economics. 1989.
Dillworth, Jack W.—BS (California State Polytechnic), M.S. (St. Mary's Univ), Ph.D. (Univ of Nevada, Reno); Professor Emeritus of Entomology & Plant Pathology. 1986.
Dobson, Russell Lee—BA (Northeastern State Univ, Oklahoma), MTEd (ibid.), EdD (Univ of Oklahoma); Professor Emeritus of Teaching and Curriculum Leadership. 1967.
Doeksens, Gerald Arthur—BS (South Dakota State Univ), MS (Oklahoma State Univ.), Ph.D. (ibid.); Regents Professor Emeritus of Agricultural Economics. 1978.
Dugger, Cecil W.—BS (Texas A&M Univ), MEd (ibid.), EdD (Oklahoma State Univ); Professor Emeritus of Aviation and Space Education. 1965.
Edelson, Jonathan V.—BS (Univ of Missouri), MS (Auburn Univ), Ph.D. (ibid.); Professor Emeritus of Entomology & Plant Pathology 1989.
Edwards, Lewis H.—BS (Oklahoma State Univ), PhD (North Dakota State Univ); Professor Emeritus of Plant and Soil Sciences. 1967.
Evans, Benny—BS (Oklahoma State Univ), MA (Univ of Michigan), Ph.D. (ibid.); Professor Emeritus of Mathematics. 1972.
Ewing, Margaret S.—BS (Oberlin College), MS (Oklahoma State Univ), PhD (ibid.); Professor Emeritus of Zoology. 1982.
Fischer, Lenny Henry—BA (Univ of Illinois), MA (ibid), PhD (ibid); Regents Professor Emeritus of History. 1946.
Fletcher, Jacqueline—BS (Emory Univ), M.S. (Univ of Montana), Ph.D. (Texas A&M); Regents Professor Emeritus of Entomology & Plant Pathology. 1983.
Fowler, Joe Wiley—BS (Oklahoma State Univ.), J.D. (Oklahoma City Univ); Professor of Legal Studies in Business. 1972.
Fox, Stanley F.—BS (Univ of Illinois), M.Phil. (Yale Univ), Ph.D. (ibid.); Regents Professor Emeritus of Zoology. 1977.
Frank, Gerald D.—BA (Valparaiso Univ), S.M.M. (Union Theological Seminary), D.M.A (Univ of Cincinnati); Professor Emeritus of Music . 1972.
Gamble, Rondal Ross—BS (Central State College, Oklahoma), MED (Adams State College, PhD (Univ of Oklahoma); Professor Emeritus of Applied Health and Educational Psychology 1996.
Hackett, Neil John—BA (Southern Illinois Univ), MA (ibid), PhD (Univ of Cincin nati); Professor Emeritus of History. 1969.
Halligan, James E.—BS (Iowa State Univ), MS (ibid), PhD (Iowa State Univ); Professor Emeritus of Educational Studies. 1992.
Harmon, Harold James—BS (Purdue Univ), MS (ibid.), PhD (ibid.); Professor Emeritus of Physics. 1977.

Harriman, Helga H.—BA (Wells College), MA (Oklahoma State Univ), PhD (ibid.); Professor Emeritus of History. 1975.

Harriman, Lynda C.—BS (Colorado State Univ), MS (Univ of Illinois), PhD (ibid.); Professor of Human Development and Family Science. 1984

Hedrick, George E.—BA (Adams State College), MA (Iowa State Univ), PhD (ibid.); Regents Professor Emeritus of Computer Science. 1970.

Jewsbury, George Frederick—BA (Mankato State College), MA (Univ of Washington), PhD (ibid.); Professor Emeritus of History. 1967.

Johnson, Louis G.—BS (Massachusetts Institute of Technology), MS (ibid.), PhD (ibid.); Professor Emeritus of Electrical & Computer Engineering. 1979.

Johnson, William D.—BS (Rocky Mountain College), MEd (Univ of Montana). EdD (Western Michigan Univ); Associate Professor Emeritus of Educational Studies. 1974.

Johnston, Thomas B.—BS (Kansas State Teachers College), BS (Fort Hays Kansas State College), EdD (Univ of Neb); Professor Emeritus of Teaching and Curriculum Leadership. 1969.

Key, James Perry—BS (Univ of Tennessee), MEd (Virginia Polytechnic Institute), EdD (North Carolina State Univ); Professor Emeritus of Agricultural Education. 1969.

Kirby, James S.—BS (Oklahoma State Univ), MS (ibid), PhD (Iowa State Univ); Professor Emeritus of Plant and Soil Sciences. 1969.


Kletke, Marilyn G.—BA (The Colorado College), MS (Iowa State Univ), PhD (Oklahoma State Univ); Professor Emeritus of Management Science and Information Systems. 1977.

Knaus, Patricia Kain—BS (Univ of Nebraska-Lincoln), MEd (ibid), PhD (ibid); Professor of Human Development and Family Science. 1989.

Kopecky, Pauline W.—BBA (Southwestern Univ), MEd (Univ of Texas), PhD (Univ of Houston); Associate Professor Emeritus of Economics. 1967.

Kremer, Eugene G.—BS (Cornell Univ), MS (Univ of Minnesota), PhD (ibid); Professor Emeritus of Plant and Soil Sciences. 1978.

LaPrad-Jordan, Patricia M.—BS (Univ of North Texas), MS (Texas A&M, Corpus Christi), EdD (Univ of Houston); Associate Professor Emeritus of Teaching and Curriculum Leadership. 1997.

Love, Ross O.—BS (Cornell Univ), MS (Michigan State Univ), PhD (ibid.); Professor Emeritus of Agricultural Economics. 1982.

Lynd, Julian Q.—BS (Univ of Arkansas), MS (Michigan State Univ), PhD (ibid); Professor Emeritus of Plant and Soil Sciences. 1951.


Max, Elizabeth—BS (Texas Women's Univ), MLS (North Texas State Univ), EdD (Oklahoma State Univ); Associate Professor Emeritus of Teaching and Curriculum Leadership. 1970.

McCoy, Ronald Timothy—BS (Arizona State Univ), MA (Northern Arizona Univ), PhD (ibid.); Professor Emeritus of History. 2009.

McCubbin, Tipton F.—BS (ibid.), MEd (Phillips Univ), JD (Univ of Oklahoma); Associate Professor of Legal Studies in Business. 1986.

McKinley, Kenneth H.—BA (Tarkio College, Missouri), MA (Univ of Iowa), PhD (ibid); Professor Emeritus of Teaching and Curriculum Leadership. 1973.

McMurphy, Wilfred E.—BS (Oklahoma State Univ), MS (ibid), PhD (Kansas State Univ); Professor Emeritus of Plant and Soil Sciences. 1964.

Mcelrath, Ulrich K.—BS (Unic of Chicago), PhD (Michigan State Univ); Regents Professor Emeritus of Biochemistry & Molecular Biology. 1975

Miller, Edwin—BS (Iowa State Univ), MS (ibid.), PhD (ibid); Regents Service Professor Emeritus of Natural Resource Ecology and Management. 1986.

Mills, Terence (Ted) John—BS (Western Illinois Univ), MA (Western Illinois Univ), EdD (Indiana Univ); Professor Emeritus of Teaching and Curriculum Leadership. 1970

Montgomery, Diane M—BS (Univ of Minnesota, Duluth), MAT (Western New Mexico Univ), PhD (Univ of New Mexico); Regents Professor Emeritus of Applied Health and Educational Psychology. 1985.

Moore, Ronald—BA (Univ of Virginia), MA (Princeton Univ), PhD (ibid.); Professor Emeritus of Economics. 1972.

Morgan, Sandra E.—M.S. (ibid.), D.V.M. (Oklahoma State Univ); Professor Emeritus of VBR: Physiological Sciences. 1998.

Nofziger, David L—BA (Goshen College), MS (Purdue Univ), PhD (ibid.); Professor Emeritus of Plant and Soil Sciences. 1974.
Verhalen, Laval M.—BS (Texas Tech Univ.), Ph.D. (Oklahoma State Univ.), Professor Emeritus of Plant and Soil Sciences. 1956.

Ward, Clement E.—BS (Iowa State Univ.), MS (Kansas State Univ.), PhD. (ibid.); Professor Emeritus of Agricultural Economics. 1978.

Warden, Paul George—BA (Baldwin-Wallace College), MA (Kent State Univ), PhD (ibid); Professor Emeritus of Applied Health and Educational Psychology. 1970.

Watson, Alastair G.—BS (Lincoln College), BVSc (Massey Univ.), MAG (ibid.), PhD (Cornell Univ.); Professor Emeritus of Veterinary Sciences. 1986.

Westphal, Paul Anthony—BS (Saint Louis Univ), PhD (Washington Univ.); Professor Emeritus of Physics. 1968.


Wiggins, Kenneth Edward—BS (Troy State College), MS (ibid), EdD (Auburn Univ); Professor Emeritus of Aviation and Space Education. 1962.

Wilhm, Jerry Leo—BS (Kansas State Teachers College), MS (ibid), PhD (Oklahoma State Univ.); Professor Emeritus of Zoology. 1966.

Williams, Joseph E.—BS (New Mexico State Univ.), MS (ibid.), Ph.D. (Iowa State Univ.); Professor Emeritus of Agricultural Economics. 1975.

Wilson, Timothy Michael—BS (Univ. of Florida), Ph.D. (ibid.); Professor Emeritus of Physics. 1969.

Wolfe, John E.—BA (Bucknell Univ), MA (Univ of California), PhD (ibid); Professor Emeritus of Mathematics. 1974.

Yarlagadda, Radha K. Rao—BE (BMS College of Engineering), MS (South Dakota State Univ), PhD (Michigan State Univ); Professor of Electrical and Computer Engineering. 1966.
Course Descriptions

For the most current course descriptions, see the Course Catalog at http://registrar.okstate.edu/coursescatalog.

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. For the latest class schedule information, see the Class schedule at http://registrar.okstate.edu/class-schedule. You will be presented with several different options for searching the Class Schedule or you may contact the departmental office for specific details regarding frequency of offerings in specific courses.

Course descriptions are listed alphabetically by course subject.

Explanation of Course Descriptions

A course description is comprised of the following elements:

Course Subject. The course subject code is comprised of no more than four letters representing the home department or course subject area

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.

Those numbered in the 5000 and 6000 range are primarily for graduate students, and only graduate students and selected seniors with consent of the Graduate College may enroll in them. Courses numbered 3000 and 4000 may be taken for graduate credit if the course is approved for credit at the graduate level. A student must perform additional assignments at an intellectual level commensurate with graduate level work as specified in the course syllabus to earn graduate credit for such a class.

Courses numbered in the 7000 range are reserved for students in the Doctor of Veterinary Medicine professional program(s). In some instances, these courses may also be offered for graduate credit under course numbers in the 5000 and 6000 range.

Course Title. The title of the course is printed in boldface letters.

General Education Requirement Codes. The capital letters in parentheses in some course titles designate courses fulfilling various undergraduate general education requirements. (See "Academic Regulations 3.4"). General education credit is also identified in the course attributes. The code letters designate the general education category for which the course may be used:

A - Analytical and Quantitative Thought
D - Diversity
H - Humanities
I - International Dimension
L - Scientific Investigation (Laboratory Science)
N - Natural Sciences
S - Social and Behavioral Sciences

Description of Course Content. The content of the course and its major emphasis are described.

Equivalent Courses. Some courses are academically identical or equivalent to other courses that are offered in different departments. Equivalent courses should include "same as..." statements in their course descriptions. Equivalent courses are denoted on the official transcript in accordance with the undergraduate repeat policy (see Academic Regulation 6.13). Credit for only one of the courses will count in the earned hours section of the transcript.

Mutually Exclusive Courses. Courses that are not identical/equivalent but contain similar or significantly overlapping content include "no credit for..." or "may not be used with..." statements in their course descriptions. Mutually exclusive (or overlapping) courses are not listed as repeats, but students may not apply credit for both courses toward a degree. For example, if the description for Course X indicates "No credit for students with credit in Course Y" or "May not be used for degree credit with Course Y," this means that a student may not use both courses to meet requirements for a single degree program. The student may use either Course X or Course Y, regardless of the order in which the courses were completed, but both courses may not be used to fulfill requirements for a single degree program. Thus, once a course is applied to a degree program, the mutually exclusive course may not be used to fulfill requirements for that program, including major hours, elective hours, total hours, etc.

Statement of Variable Credit. Each course number ending in zero is followed by a statement of the credit that may be earned. Typical entries are 1-6 credits, maximum 6, and 1-3 credits, maximum 12. The first part of the entry indicates the permissible credit per enrollment, followed by a statement of the maximum credit which may be earned in the course through repeated enrollment.

Prerequisite(s). Prerequisite courses, exam scores, or other requirements prior to enrollment are listed in detail. Prerequisite course statements include full course subjects and numbers and use logical operators (and/or) and parentheses where needed to clearly convey course requirements. See also Academic Regulation 5.6.

Levels. The level indicates whether the course can be offered at the Undergraduate, Graduate, or Professional level. Some courses are approved to be offered at more than one level.
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Accounting (ACCT)

ACCT 2103  Financial Accounting. Prerequisite(s): 24 semester credit hours, including ENGL 1113 and MATH 1483 or equivalent. Financial accounting concepts and the use of financial accounting information in decision-making.

ACCT 2203  Managerial Accounting. Prerequisite(s): 2103. Managerial accounting concepts and objectives, planning and control of sales and costs, analysis of costs and profits.

ACCT 3013  Federal Income Taxation. Prerequisite(s): 2203; by permission only; satisfactory score on a qualifying exam covering basic accounting concepts. 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.

ACCT 3103  Intermediate Accounting I. Prerequisite(s): 2203 with a grade of "C" or better; by permission only; satisfactory score on a qualifying exam covering basic accounting concepts. Theory and concepts underlying financial accounting and reporting.

ACCT 3113  Intermediate Accounting II. Prerequisite(s): ACCT 3103 with a grade of "C" or better; a satisfactory score on a qualifying exam covering basic accounting concepts. Theory and concepts underlying financial accounting and reporting. Continuation of ACCT 3103.

ACCT 3183  Agribusiness Accounting and Taxation. Prerequisite(s): 60 semester credit hours, including ENGL 1113 and MATH 1483 or equivalent. Development of the ability to read, analyze, and use accounting information to improve management decision-making and tax planning. (Same course as AGEC 3183)

ACCT 3023  Cost Accounting. Prerequisite(s): 2203; STAT 2023; by permission only; satisfactory score on a qualifying exam covering basic accounting concepts. Cost accumulation systems, allocating product costs, planning and controlling costs, standard costing, and profitability analysis.

ACCT 3603  Accounting Information Systems. Prerequisite(s): 2203; by permission only; satisfactory score on a qualifying exam covering basic accounting concepts. Accounting system design and installation.

ACCT 4033  Advanced Federal Income Taxation. Prerequisite(s): ACCT 3103; a satisfactory score on a qualifying exam covering basic accounting concepts. Federal income tax law applicable to individuals, corporations, partnerships, trusts and estates, and other specialized topics.

ACCT 4133  Advanced Accounting. Prerequisite(s): ACCT 3113 with grade of "C" or better; a satisfactory score on a qualifying exam covering basic accounting concepts. Accounting for business combinations and consolidations, accounting for governmental and not-for-profit entities.

ACCT 4233  Internal Auditing. Prerequisite(s): ACCT 3103 and ACCT 3603; a satisfactory score on a qualifying exam covering basic accounting concepts. Examination of theory and practices utilized by internal auditors in performing operational audits to assure an organization’s operational effectiveness, efficiency, and control over resources.

ACCT 4503* Auditing and Assurance Services. Prerequisite(s): ACCT 3103 and ACCT 3603; a satisfactory score on a qualifying exam covering basic accounting concepts. Auditing theory, procedures and practices.

ACCT 4553  Ethical Issues in Accounting. Prerequisite(s): Admission to the MS/PPA or permission of Department; a satisfactory score on a qualifying exam covering basic accounting concepts. Basic theories of ethics, including moral reasoning, moral values, relativity and objectivity, freedom and responsibility. Lecture, and case of examination of issues such as independence, integrity, objectivity, client relationships, employee-employer relations, advertising, preferential treatment, core values and the corporation, and corporate governance, such as Sarbanes-Oxley Act, Foreign Corrupt Practices Act, and SEC regulations.

ACCT 5113*  Financial Accounting Research. Prerequisite(s): 3103 with a grade of "C" or better; a satisfactory score on a qualifying exam covering basic accounting concepts. Development of tax research skills.

ACCT 5023*  Estate and Trust Taxation. Prerequisite(s): Admission to MS in accounting. Federal and Oklahoma wealth transfer tax systems, including estate, gift, and generation-skipping transfer taxation. Also, treatment of income taxation of estates and trusts and estate planning.

ACCT 5033*  Natural Resource Taxation. Prerequisite(s): Admission to MS in accounting. Federal income tax laws applicable to the acquisition, operation, and disposal of natural resource properties.

ACCT 5043*  Partnership Taxation. Prerequisite(s): Admission to MS in accounting and completion of 5013. Federal income tax laws applicable to partnerships.

ACCT 5053*  Corporate Taxation. Prerequisite(s): Admission to MS in accounting and completion of 5013. Federal income tax law applicable to corporations and shareholders.

ACCT 5083*  MBA Tax Management. Prerequisite(s): Admission to MBA program or consent of MBA director. An introduction to the basic framework of the federal income tax system with an emphasis on recognition of the tax implications of business transactions and how taxes affect managerial decision-making. An exploration of the social and economic policy ramifications of the tax system.

ACCT 5103*  Seminar in Contemporary Accounting Theory I. Prerequisite(s): 3113 with a grade of "C" or better and admission to the MS in accounting program. Origins and development of accounting theory. Critical study of issues in contemporary accounting theory.

ACCT 5113*  Financial Accounting Research. Prerequisite(s): 3113 with a grade of "C" or better and admission to the MS in accounting program. Research and presentation of solutions for complex issues in contemporary accounting practice; using databases, SEC, FASB, AICPA, IASB, as well as other publicly available information.

ACCT 5123*  Enterprise Resource Planning. Prerequisite(s): Graduate standing. ACCT 5103 and 5113. Resource planning for global business organizations. Integrated data flow and computer software for enterprise resource planning. Integration of transactional analysis, fundamental accounting practice, financial planning, and supply chain analysis forming the basis for study in this integrated approach to enterprise resource planning.

ACCT 5133*  International Oil and Gas Accounting. Prerequisite(s): 3113 with a grade of "C" or better and admission to the MS in accounting program. Financial accounting and reporting for U.S. and international oil and gas operations. Domestic and international joint interest accounting. Accounting for international concession and profit sharing agreements.

ACCT 5153*  International Oil and Gas Accounting. Prerequisite(s): 3113 with a grade of "C" or better and admission to the MS in accounting program. Study of the demand and supply of financial data, properties of information derived from financial statements, the role of financial information in investment decisions, and features of the decision-making environment.

ACCT 5163*  MBA Financial Reporting. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Fundamentals of financial reporting, preparation and analysis of financial statements, and the role of financial accounting in decision-making.

ACCT 5203* Seminar in Contemporary Accounting Theory II. Prerequisite(s): ACCT 5163 with a grade of "C" or better and admission to the MS in accounting program. Origins and development of accounting theory. Critical study of issues in contemporary accounting theory. Continuation of 5103.

ACCT 5233*  Valuation and Advanced Cost Management. Prerequisite(s): Advanced study in financial accounting and management. Valuation of assets using a variety of interdisciplinary business methods. Advanced topics in cost management including the role of risk and its impact on valuation and cost management issues.

ACCT 5283* MBA Managerial Accounting. Prerequisite(s): 5163 and admission to MBA program or consent of MBA director. Interpretation of accounting data in planning, controlling and decision-making.

ACCT 5503* Auditing and Assurance Services. Prerequisite(s): Admission to professional program in accounting (PPA)/MS in accounting program. Auditing theory, procedures and practices.

ACCT 5513* Advanced Auditing and Assurance Services. Prerequisite(s): 5163 or equivalent. Introduction to fraud examination and legal issues involved in investigative process. Advanced topics in statutory auditing, operational auditing and investigative services.

ACCT 5543* Fraud Examination. Prerequisite(s): Permission of SSB Graduate Programs office. Schemes used in the commission of white-collar fraud, as well as causes, symptoms and prevention methods related to these crimes.

ACCT 5553* Forensic Accounting Tools. Prerequisite(s): Permission of SSB Graduate Programs. (Same course as AGEC 5553). In-depth study and practice with tools that are most critical in conducting proactive fraud detection and fraud investigations.

ACCT 5603* Accounting-Based Information Systems. Prerequisite(s): Permission of SSB Graduate Programs office. Concepts underlying the design and use of an effective accounting information system.

ACCT 5613* Business Systems Control and Risk Analysis. Prerequisite(s): Permission of SSB Graduate Programs Office. Controlling and auditing business information systems, including management and applications controls, electronic commerce and Internet-related controls and evaluation of system.
ACCT 5753* Seminar in International Accounting. Prerequisite(s): 3113 with a grade of "C" or better and admission to the MS in accounting program. Not available for students who have credit in 4733. Accounting issues faced by multinational enterprises and internationally listed companies, including diversity in financial reporting and harmonization.

ACCT 5783* MBA International Accounting. Prerequisite(s): 5183 and admission to MBA program or consent of MBA director. Diversity in financial reporting across countries and its effect on global capital flows. Corporate financial information across borders. Accounting in emerging markets.

ACCT 5830* Graduate Internship in Accounting. 1-3 credits, max 3. Prerequisite(s): Admission to MS/PPA in accounting, consent of graduate coordinator and either 5503 or 5013. Supervised internship in public accounting, industry, or not-for-profit organizations. May be counted as elective hours only.

ACCT 5840* Special Topics and Individual Work in Accounting. 1-10 credits, max 10. Prerequisite(s): Consent of instructor. Individual work on special topics, projects or readings selected to acquaint students with significant accounting literature.

ACCT 5850* Practicum in Professional Accounting. 1-6 credits, max 6. Prerequisite(s): Admission to MS/PPA in accounting program. Study of accounting policies, retirement policies, tax issues, and other relevant business issues associated with mergers, acquisitions, and divestitures.

ACCT 5860* MBA Special Topics in Accounting. 1-3 credits, max 3. Prerequisite(s): 5183 and admission to MBA program or consent of MBA director. Individual work on special topics, projects or readings to acquaint students with accounting literature.

ACCT 5932* Research Report. Prerequisite(s): Consent of supervising professor and admission to MS in accounting. Restricted to candidates seeking the MS in accounting degree and not available to students who have credit in 5940. 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.

ACCT 5940* Thesis. 1-6 credits, max 6. Prerequisite(s): Admission to MS in accounting. For students writing reports and theses in accounting.

ACCT 6000* Doctoral Research and Dissertation. 1-18 credits, max 36. Prerequisite(s): Approval of advisory committee. For students working on the doctoral degree.

ACCT 6110* Graduate Readings and Special Topics in Accounting. 1-3 credits, max 20. Prerequisite(s): 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.

ACCT 6703* Seminar in Accounting Research. Prerequisite(s): Doctoral student status and consent of coordinator of graduate programs in accounting. Theoretical literature and research methodology in accounting.

Aerospace Studies - Air Force (AERO)

AERO 1111 Foundations of the U.S. Air Force 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.


AERO 2111 Evolution of U.S. Air Force Air and Space Power I. Lab 1. Growth and development of aerospace power through history beginning with first manned flights and continuing through World War II.

AERO 2211 Air Power History 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 U.S. air power.

AERO 3103 Air Force Leadership Studies I. Lab 2. 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.

AERO 3203 Air Force Leadership Studies 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.

AERO 3504 Field Training Encampment Program. Prerequisite(s): Consent of professor of aerospace studies. Practical training on an Air Force base. Junior officer training, familiarization training in most functional aspects of a typical Air Force base. Includes career orientation, small arms firing, flight orientation rides, and survival training.

AERO 4103 National Security Affairs I. Lab 2. The formulation, organization and context of national security; civil-military interaction and the evolution of strategy. Review of the military profession and officership.

AERO 4201 National Security Affairs II. Lab 1. Strategy and management of conflict; implementation of national security and regional world issues. Review of societal issues in the military profession and the military justice system.

AERO 4402 Summer Professional Development Training Program. Prerequisite(s): Consent of professor of aerospace studies. 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.


Agricultural Communications (AGCM)

AGCM 2113 Agricultural Communications. Prerequisite(s): ENGL 1213 or ENGL 1413. Major in AGCM or consent of instructor. Fundamentals of agricultural news writing and other communication methods. Careers in and the role of the media in agriculture and related fields.

AGCM 3100 Special Topics in Agricultural Communications. Prerequisite(s): consent of instructor. Investigation of specialized and/or advanced topics and issues related to agricultural communications.

AGCM 3103 Written Communications in Agricultural Sciences and Natural Resources. Prerequisite(s): . 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. Review of societal issues in the military profession and the military justice system.

AGCM 3113 Writing and Editing for Agricultural Publications. Lab 2. Prerequisite(s): 2113 with a grade of "C" or better; major in agricultural communications; score of 3 or better on writing assessment; or consent of instructor. Professional preparation and development for careers in writing and editing for agricultural publications.

AGCM 3123 New Media in Agricultural Communications. Lab 2. Prerequisite(s): 3113 and 3233. Exploration and application of emerging media technologies for agricultural communicators as used in promoting, marketing and communicating about agriculture, food, natural resources and the environment.

AGCM 3203 (S) Oral Communications in Agricultural Sciences and Natural Resources. Prerequisite(s): ENGL 1213 or consent of instructor. Application of oral communications skills used in the dissemination of information related to agricultural sciences and natural resources, and related topics. Acquisition of interpersonal communications skills and small group, impromptu and professional presentation skills.

AGCM 3213 Layout and Design for Agricultural Publications. Lab 4. Prerequisite(s): 2113 or JB 2003; major in agricultural communications or consent of instructor. Practical application of design principles, typography, desktop-publishing software and printing practices. Opportunity for service-learning experiences.

AGCM 3223 Web Design for Agricultural Organizations. Lab 4. Prerequisite(s): 2113 or JB 2003; major in agricultural communications or consent of instructor. Practical application of design principles, typography, desktop-publishing software and printing practices. Opportunity for service-learning experiences.

AGCM 3233 Basic Photography and Photo Editing for Agriculture. Lab 4. Prerequisite(s): 2113 or JB 2003; major in agricultural communications or consent of instructor. Beginning course focusing on photographic equipment, related software and photo composition in an agricultural setting.

AGCM 3503 Issues Management and Crisis Communications in Agriculture and Natural Resources. Prerequisite(s): AGCM 2113 and an oral communications course. Theoretical perspectives and practical applications of issues management, crisis management, and crisis communications principles. Development of knowledge, skills, and abilities necessary for identifying and managing issues faced by organizations; leading organizations through crises; and communicating before, during and after crises.

AGCM 4113* Features Writing and Editing for Agricultural Publications. Prerequisite(s): 3113 with a grade of "C" or better; major in agricultural communications or consent of instructor. Brainstorming, researching, interviewing, developing, writing and editing feature stories for agricultural publications.

AGCM 4203* Professional Development in Agricultural Communications. Prerequisite(s): 2113 or JB 2003; major in agricultural communications or consent of instructor. Professional preparation and development for careers in agricultural communications. Professional communications, resume and portfolio development, presentations, networking and job interviews. Introduction to event planning.

AGCM 4233 Agricultural Photography Tour I. Lab 2. Agricultural photography travel course focused on advanced composition techniques including but not
limited to night photography, portraits, painting, etc. Students will be exposed to many cultural and agricultural sites from a photographic perspective. No credit for students with credit in AGCM 5233.

**AGCM 4300 Internships in Agricultural Communications.** 1-6 credits, max 6. Prerequisite(s): Consent of internship coordinator and adviser. Supervised work experience with approved employers in agricultural communications. Presentation required following the internship experience.

**AGCM 4403 Planning Campaigns for Agriculture and Natural Resources.** Lab 4. Prerequisite(s): 3113 or JB 3263; AGCM 3213; major in agricultural communications or consent of instructor. Communications campaign development for agriculture and natural resources activities and issues, including development of materials, budgets and contracts. Consent of supervising professor. Individual and small group study or research in problems related to communications within the agricultural sector and from the agricultural sector to other constituencies.

**AGCM 5000 Research and Thesis.** 1-6 credits, max 6. Prerequisite(s): Graduate standing. Independent research and thesis under the direction and supervision of a major professor.

**AGCM 5100 Special Topics in Agricultural Communications.** 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Investigation of specialized and/or advanced topics and issues related to agricultural communications.

**AGCM 5101 Orientation to Graduate Programs in Agricultural Education, Communication, and Natural Resources.** Prerequisite(s): Graduate standing. Orientation to graduate programs in agricultural education and communication including degree expectation, understanding scholarship, orientation to the discipline, introduction to research agendas, and identification of support systems. (Same course as AGED 5101)

**AGCM 5103 History and Philosophical Foundations of Agricultural Communications.** Prerequisite(s): Graduate standing. Discussion of the history, philosophical foundations and current issues regarding agricultural communications and the land-grant system.

**AGCM 5132 Writing for Scholarly Publications in Agricultural Sciences and Natural Resources.** Development of scientific writing skills for agricultural sciences and natural resources disciplines, including research proposals, theses, dissertations, conference papers, and journal articles.

**AGCM 5203 Theory and Practice in Agricultural Communications.** Prerequisite(s): Graduate standing. The study of major communication theories and theorists in the context of agricultural communications.

**AGCM 5213 Advanced Concepts in Agricultural Publishing.** Prerequisite(s): Graduate standing. Analysis, redesign and creation of agricultural publications. Evaluation of audience, production, advertising and editorial content.

**AGCM 5233 Agricultural Photography Tour.** Lab 2. A rural photography travel experience focused on advanced composition techniques including but not limited to night photography, portrait, landscapes. Students will be exposed to many cultural and agricultural sites from a photographic perspective. No credit for students with credit in AGCM 4233.

**AGCM 5303 Communicating Ethical Issues in Agriculture.** Prerequisite(s): Graduate standing. An introduction to communicating ethical theories in the context of agriculture. Ethical theory and current research are used to critique contemporary issues in agriculture.

**AGCM 5403 Public Relations Campaigns in Agricultural Sciences and Natural Resources.** Lab 2. Prerequisite (s): AGCM 5213. Public relations campaign development for agriculture and natural resource organizations and issues, including public relations theory, strategic planning and campaign material development. No credit for students with credit in AGCM 4403.

**AGCM 5503 Disaster Management and Communication in Agricultural Sciences and Natural Resources.** Development of disaster management and communication skills and knowledge, with special application to agricultural sciences and natural resources disaster and terrorism situations.

**AGCM 5990 Studies in Agricultural Communications.** Prerequisite(s): Consent of supervising professor. Individual and small group study or research in agricultural communications topics and issues.

**Agricultural Economics (AGEC)**

**AGEC 1101 Agricultural Economics and Agribusiness Experience.** Developing connections between the student’s major curriculum, career goals specific to agricultural economics or agribusiness, and networking with other students, faculty, and alumni.

**AGEC 1113 (S) Introduction to Agricultural Economics.** Economic theory of production, marketing, and consumption of agricultural products and natural resources. The role and structure of agricultural sciences and natural resources within the American economy. Policies to achieve efficiency and welfare goals in agriculture. No general education credit for students also taking ECON 1113 or ECON 2103.

**AGEC 2303 (D) Food Marketing to a Diverse Population.** Food and beverage demand and preferences of socially and ethnically constructed groups in American Society. Real life issues of marketing to a diverse population, including Native, Asian, African, and Hispanic Americans, and low-income populations.

**AGEC 2313 (I) Case Studies in Agricultural Trade and Development.** Prerequisite(s): A course in economics or marketing. Real world issues in international trade and development of agricultural and food products. Development of an understanding of issues facing policymakers, producers, consumers, and other groups in examining the costs and benefits of various trade and development programs.

**AGEC 2990 Problems in Agricultural Economics and Agribusiness.** 1-6 credits, max 6 Directed study on topics related to agricultural economics or agribusiness.

**AGEC 3010 Internship in Agricultural Economics.** 1-3 credits, max 3. Prerequisite(s): 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.

**AGEC 3101 Professional Career Development.** Prerequisite(s): Junior standing and agricultural economics or agribusiness major status. Overview of the various areas of specialization within agricultural economics and agribusiness and their associated career opportunities and obligations. Development and improvement of written communication, oral communication and leadership skills.

**AGEC 3183 Agribusiness Accounting and Taxation.** Prerequisite(s): 50 semester credit hours, including ENGL 1113 and MATH 1513 or equivalent. Development of the ability to read, analyze, and use accounting information to improve decision-making and tax planning. (Same course as ACCT 3183)

**AGEC 3192 Quantitative Methods in Agricultural Economics.** Lab 2. Prerequisite(s): 1113 or ECON 2103, and STAT 2023 or equivalent. Indices, graphics, budgeting, interest calculations, compounding and discounting, basic statistic measures, regression, optimization and computer applications.

**AGEC 3233 Agricultural Product Marketing and Sales.** Prerequisite(s): AGCM 5132 or ECON 2103, and ENGL 1113. Fundamentals of agricultural marketing management and planning applied to specific agricultural product (input and output) marketing problems. Institutional differences between agricultural and non-agricultural marketing environments. The role of the individual sales representative in a marketing and sales organization. Written and oral presentations of marketing and sales information required of all students.

**AGEC 3333 Agricultural Marketing and Price Analysis.** Prerequisite(s): 3213 or concurrent enrollment. Supply, demand, and price determination within the agricultural environment and marketplace; application of microeconomic theory provided by government intervention, marketing agreements, and cooperatives in agricultural markets. Some graphical analysis of commodity market data. Fundamentals of futures markets applied to agriculture.

**AGEC 4043 Agricultural Small Business Management.** Prerequisite(s): AGCM 5132 or ECON 2103, and ACCT 2103 or ACCT 3183 or AGEC 3183. The essentials of operating an agricultural small business. An introduction to the planning, organizing, marketing, managing, financing, controlling and operating an agricultural small business. Not recommended for agricultural economics or agribusiness majors. No credit for students with prior credit in AGEC 4423.

**AGEC 4232 Farm and Agribusiness Management.** Prerequisite(s): AGCM 1113 or ECON 2103, and ACCT 2103 or ACCT 3183 or AGEC 3183. Fundamentals of managerial functions as applied to agricultural firms. Organization and management of human, financial, and physical assets for the profitable operation of an agricultural business. Focus on production to business planning, enterprise budgeting, financial statements and record keeping.

**AGEC 4363 Agricultural Cooperatives.** Prerequisite(s): 1113 or ECON 2103. An evaluation of the fundamental principles, objectives, structure, finance, and management associated with the cooperative organization. An analysis of the cooperative business organization within the modern economy: history, legislation and evolution. An examination of careers related to cooperatives.

**AGEC 5303 Natural Resource Economics.** Prerequisite(s): 1113 or 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 impact on management opportunities. Supply of and demand for natural resources, resource allocation over time, rights of ownership, public issues of taxation, police power and eminent domain.

**AGEC 5304 Financial Analysis.** Prerequisite(s): 3213 and 4243. Analyze farm and agribusiness financial statements. Understand the relationship between firm growth and financial leverage. Time value of money concepts and their application to capital budgeting. Discuss how agricultural lenders acquire and use funds.
AGEC 3703 Issues in Agricultural Policy. Prerequisite(s): AGEC 1113 or ECON 2103. Emerging issues related to agricultural policy in the United States.

AGEC 3713 Agricultural Law. Prerequisite(s): AGEC 1113 or ECON 2103. Survey of law with emphasis on agricultural problems, applications, and strategies for managing legal risk in the agricultural setting. Contract law, tort law, property law, real estate transactions, business organization, estate planning, debtor/creditor law, environmental law, and water/resources law.

AGEC 3810 Domestic Agricultural Economics Tour. 1-3 credits. Prerequisite(s): Consent of Instructor. An integrated approach to the cultural, agricultural, historical, political, and economic backgrounds of an agricultural region of the United States.

AGEC 3990 Special Problems in Agricultural Economics. 1-3 credits, max 3. Directed study of selected agricultural economics topics. Analysis of specific agricultural market cases with written and oral presentation of the results.

AGEC 4333* Commodity Futures Markets. Prerequisite(s): 3213 and 3333. The economics of commodity futures markets. The vocabulary of futures markets and the mechanisms of trading and hedging. Basis and arbitrage, risk management strategies. Fundamental analysis and statistical analysis of data. Technical analysis, behavioral finance, efficient market hypothesis, and basics of option pricing.

AGEC 4343 (L) International Agricultural Markets and Trade. Prerequisite(s): 1113 or ECON 2103 and a graduate level international trade course and permission of Professor. Introduction to international agricultural trade and problems with linear programming, simulations, and other tools. Analysis of the acquisition of resources and the use of information systems in managing the individual farm or ranch business.

AGEC 4423* Advanced Agribusiness Management. Prerequisite(s): AGEC 3333, AGEC 3603 or FIN 3113 or concurrent. Application of modern decision theory in the uncertain environment that the agricultural business operates. Planning, organizing, implementing, coordinating, and controlling problems associated with establishing an agricultural business, achieving firm growth, and operating the firm over time. Use of spreadsheets to perform regression analysis and solve linear programming problems and applications. Tools to identify, evaluate critically, and seek solutions to complex international trade and development problems, such as gains from trade, comparative advantage, impacts of trade barriers on social welfare, export promotion effectiveness, trade impacts on environment and land degradation, free trade areas, and impacts of genetically modified crops on trade.

AGEC 4463* Advanced Farm and Ranch Management. Prerequisite(s): AGEC 3603 or concurrent. The development of problem solving and risk management skills needed on the modern farm or ranch. Use of spreadsheets to perform production and marketing analyses and solve linear programming problems. Introduction to spreadsheets and computer applications.

AGEC 4503* Environmental Economics and Resource Development. Prerequisite(s): AGEC 3503 or ECON 3023 or ECON 3113 or consent of instructor. Analysis of 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.

AGEC 4513* Farm Appraisal. Lab 2. Prerequisite(s): 3423. Estimating the market value of agricultural real estate using the three approaches to value - sales comparison, cost, and income approaches. Analysis of sales to value the different characteristics of the farm.

AGEC 4613* Advanced Agricultural Finance. Prerequisite(s): AGEC 3063 or FIN 3113 with a grade of "B" or better, ECON 3023 or ECON 3113, and STAT 2023 or equivalent. Advanced time value of money and financial management concepts as applied to the management of agricultural firms. Incorporating risk into agricultural investment and financial management decisions. Introduction to risk modeling. May not be used for degree credit with AGEC 2603.

AGEC 4703* American Agricultural Policy. Prerequisite(s): AGEC 3333, MATH 2103, and ECON 3023 or ECON 3113. Economic characteristics and problems of agriculture; evolution and significance of programs and policies.

AGEC 4723* Rural Economics Development. Prerequisite(s): 1113 or ECON 2103. Concepts, theories, and applications of regional and community economic development, including theories of economic development, analytics techniques, infrastructure and community services, targeted development, and associated policies. Focus on domestic rural areas.

AGEC 4803 (L) International Agricultural Economics Tour. Prerequisite(s): Consent of instructor. A two-week international travel component. An integrated approach to the cultural, agricultural, historical, technological, political, economic, and religious backgrounds of the region. Comparison of the agricultural business environment of the region to that of the U.S.

AGEC 4990* Problems in Agricultural Economics. 1-6 credits, max 6. Open to students with consent of instructor only. Research on special problems in agricultural economics.

AGEC 5000* Master's Thesis/Report. 1-6 credits, max 6. For students working on an MS degree in agricultural economics. Independent research and thesis under the direction and supervision of a major professor.

AGEC 5010* Professional Experience in Agricultural Economics or Agribusiness. 1-6 credits, max 6. Prerequisite(s): Approval of internship coordinator and adviser. Supervised professional experience with approved public and private employers in agricultural economics or agribusiness. Designed for Master of Agriculture program. Graded on pass-fail basis.

AGEC 5101* Research Methodology. Prerequisite(s): Selection of a thesis adviser and a thesis topic. Using the scientific method to solve problems related to agriculture. Preparation of a thesis proposal required.

AGEC 5103* Mathematical Economics. Prerequisite(s): Differential calculus and ECON 3113. Mathematical tools necessary for formulation and application of economic theory and economic models.

AGEC 5113* Applications of Mathematical Programming. The application of concepts and principles of existing linear and nonlinear programming techniques to agricultural problems.

AGEC 5203* Advanced Agricultural Prices. Prerequisite(s): 5103, STAT 4043. Demand and price structures, price discovery, time series and agricultural price research methods.

AGEC 5213* Econometric Methods. Prerequisite(s): 5103 and ECON 4213 or STAT 4043. Application of econometric techniques to agricultural economic problems, theory and estimation of structural economic parameters.

AGEC 5233* Primary Data Analysis in Economic Research. Prerequisite(s): 5213 and ECON 5243 or concurrent enrollment. Advanced topics in agricultural time series analysis and analysis of surveys and experiments designed to collect primary data for research economic. Surveys of basic and experimental design, survey delivery, and sampling. Methods, economics, and econometrics of valuation methods including contingent valuation, experimental auctions, factor analysis, cluster analysis, and structural equations modeling, including limited dependent variable models such as the logit, probit, ordered probit, multinomial logit, tobit and interval censored regression.

AGEC 5311* Agricultural Marketing: Concepts and Tools. Prerequisite(s): ECON 3113, MATH 2103 or MATH 2144 and STAT 2023 or equivalent. Role of markets and prices in the food system. Price variation across space, time, and form.

AGEC 5321* Agricultural Marketing and Economic Development. Prerequisite(s): 5311. Role of marketing in economic development, focusing on international economics; role of institutions in a market economy.

AGEC 5331* Agricultural Marketing: Advanced Concepts. Prerequisite(s): 5311. Advanced topics in price variation across space, time, and form. Market and firm efficiency. Market structure, conduct, and performance; role of information in a market economy; and other selected topics.

AGEC 5343* International Agricultural Markets and Trade. Contemporary international agricultural trade theory and applications. Broadening students' understanding of contemporary cultural and economic issues outside the U.S. that affect global demand. Gains from trade and the theory of comparative advantage. No credit for students with credit in AGEC 4343.

AGEC 5353* Advanced Case Studies in Agricultural Marketing and International Development. Prerequisite(s): Consent of instructor. Advanced real world issues in marketing and international development of agricultural and food products. Development of an understanding of issues facing policy makers, producers, consumers, and other groups in examining the costs and benefits of various international marketing, trade and development programs.

AGEC 5403* Production Economics. Prerequisite(s): 5103. Analysis of micro-level production economics problems; product-product, factor-factor and product-product relationships; functional forms for technical unit and aggregate production functions; maximizing and minimizing choice rules; firm cost structure and supply and demand relationships.

AGEC 5423* Agribusiness Management. Prerequisite(s): Consent of instructor. Application of quantitative analysis to the evaluation of business plans for agribusiness firms. Preparation of business plans, including mission statements, financial analyses, marketing plans, personnel, and organization requirements of the firm, production and operations plans as well as a contingency plan. Analysis of risk factors associated with agribusinesses and agriculture-based companies. No credit for students with credit in AGEC 4223.

AGEC 5463* Advanced Agricultural Cooperatives. Prerequisite(s): 3463 or consent of instructor. Advanced understanding of cooperative business model and management skills. Advanced cooperative finance including profit center analysis, equity management, working capital management, budgeting, and capital budgeting.

AGEC 5483* Bio-Energy Feasibility and Commercialization. Prerequisite(s): AGEC 1113 or ECON 2103. Feasibility and commercialization of bio-fuel and...
bio-based projects. Issues and processes in transitioning a project from pilot scale into commercialization.

AGEC 5503* Economics of Natural and Environmental Resource Policy. Prerequisite(s): AGEC 4503 or ECON 3113 or ECON 3023 and MATH 2103. Economics of long term resource use with particular emphasis on agricultural and environmental problems. Methods for estimation of nonmarket prices. Cost benefit analysis. Economic resource use and environmental policy. Elementary computer simulation of long term resource use and environmental policy.

AGEC 5603* Advanced Agricultural Finance. Prerequisite(s): AGEC 3603 or FIN 3113, ECON 3023 or ECON 3115, and STAT 2023 or equivalent. Advanced investment and financial management concepts applied in firms that operate in the agricultural sector. Incorporating uncertainty and risk into financial modeling and decision making via stochastic simulation and other tools. Risk/return tradeoff for stocks, portfolio management and business investments. May not be used for degree credit with AGEC 4613. Same course as AGEC 4613.

AGEC 5703* Economics of Agriculture and Food Policy. Prerequisite(s): 4703 and 5103. Application of welfare criteria and economic analysis to agricultural, food, and rural development problems and policies.

AGEC 5713* Rural Regional Analysis. Prerequisite(s): 5103. Concepts of market and nonmarket based rural welfare; theories of regional growth as applied to rural areas; methods of regional analysis including computable general equilibrium; analysis of policies and programs for improving welfare of rural population groups.

AGEC 5723* Planning and Policy for Development. Prerequisite(s): Master’s-level microeconomics, macroeconomics, and regression analysis. Economics of market-based planning and policy analysis for developing countries. Topics and tools in macro- and microeconomics of development, and social cost-benefit and project analysis with emphasis on agricultural and public policy. Hands-on application of econometrics, input-output analysis, and cost-benefit analysis using econometric software.

AGEC 5733* International Agricultural Policy and Development. Global welfare analysis of national food and agricultural trade and development policies of developed and developing countries. Analysis of import demand systems using real world data and incorporating economic and demographic variables.

AGEC 5783* Bio-Energy Economics and Sustainability. Prerequisite(s): AGEC 3613 or ECON 3023. Bioenergy issues related to supply chains producing bio-energy and bio-based products. Economic, sustainability and social dimensions of these industries. Triple bottom line objectives, life cycle analysis and the principles of feasibility analysis.

AGEC 5990* Advanced Studies. 1-6 credits, max 6. Open to graduate students with consent of instructor only. Investigation in designated areas of agricultural economics.

AGEC 6000* Doctoral Dissertation. 1-15 credits, max 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.

AGEC 6102* Teaching Practicum in Agricultural Economics. Lab 4. Prerequisite(s): Two semesters of graduate study in agricultural economics. Philosophies of resident and nonresident teaching, general tasks performed, review, evaluation and lecture organization, preparation and presentation.

AGEC 6103* Advanced Applications of Mathematical Programming. Prerequisite(s): ECON 3113. General presentation of nonlinear optimization theory and methods followed by applications of nonlinear programming. Use of GAMS/MINOS optimization software package.

AGEC 6213* Advanced Econometrics. Prerequisite(s): 5213 or ECON 5243; STAT 4203 and 4213 recommended. Using advanced econometric techniques in applied research. Linear and nonlinear hypothesis testing; non-nested hypothesis tests; Monte Carlo hypothesis testing; stochastic simulation; misspecification testing. Extensive use of SAS statistical software package.

AGEC 6300* Agricultural Marketing Seminar. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Current developments in theory, techniques for evaluating marketing behavior, market legislation and market development.

AGEC 6303* Advanced Agricultural Marketing. Prerequisite(s): 5303. Marketing theory, market structure and performance, governmental regulation and policy and bargaining in agricultural markets.

AGEC 6400* Seminar in Farm Management and Production Economics. 1-6 credits, max 6. Prerequisite(s): 5403 or consent of instructor. Scientific research methodology applied to problems of resource efficiency.

AGEC 6403* Advanced Production Economics. Prerequisite(s): 5403. Formulating and solving applied economic optimization problems in agricultural production economics. Expected profit maximization; analyzing data from agronomic experiments; credit scoring; risk models such as stochastic dominance and expected utility.

AGEC 6700* Agricultural Policy and Rural Resource Development Seminar. 1-6 credits, max 6. Frontier issues in agricultural policy, natural resources and rural development.

Agricultural Education (AGED)

AGED 2011 Topics and Issues in Agricultural Education. An exploration into the world of teaching secondary agricultural education with a focus on the role and importance of the comprehensive agricultural education program. Observation of teachers in an experiential manner by actively interviewing agricultural education teachers, school principals, and appropriate state staff; assisting with FFA activities; and observing students’ SAE opportunities.

AGED 3101 Laboratory and Clinical Experiences in Agricultural Education. Practical and clinical experiences in agricultural education teaching and related careers. Requirements for admission to professional education, student teaching, and internships.

AGED 3103 Foundations and Philosophies of Teaching Agricultural Education. Lab 2. Prerequisite(s): 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.

AGED 3203* Planning the Community Program in Agricultural Education. Lab 2. Prerequisite(s): 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.

AGED 4103* Methods and Skills of Teaching and Management in Agricultural Education. Prerequisite(s): AGED 3101, AGED 3203; EPSY 3213 or 3413; ECON 3113. A full admission to the University Professional Education Program. Facets of the teaching and learning process including teaching methods, basic teaching skills, proper classroom management techniques, and motivational techniques and ideas. Preparation for student teaching.

AGED 4113 Laboratory Instruction in Agricultural Education. Lab 2. Prerequisite(s): 3101 and 3203 and EPSY 3213 (or 3413) and SPED 3202 and concurrent enrollment in 4103 and 4200 and full admission to the University Professional Education Program. Methods of teaching agricultural education in a laboratory setting. A study of laboratory safety instruction, methods of teaching and application of technical agricultural skills to the secondary program.

AGED 4200 Student Teaching in Agricultural Education. 1-9 credits, max 9. Prerequisite(s): AGED 4103, EPSY 3213 or EPSY 3413; SPED 3202; Concurrent enrollment in AGED 4113; full admission to the University Professional Education program. Full-time supervised student directed experience in an approved agricultural education department. Applications of methods and skills in agricultural education as related to selecting, adapting, utilizing, and evaluating curriculum materials and experiences to meet educational goals and facilitate learning for individual students. Roles, responsibilities, and organization and operation of school systems.

AGED 4203* Professional Development in Agricultural Education. Prerequisite(s): AGED 4103; EPSY 3213 or EPSY 3413; SPED 3202. Professional preparation and development for careers as agricultural educators. Professional correspondence courses, interviewing, networking, and other employability skills. Reflection and evaluation of instruction, project supervision and advising of youth leadership development organizations.

AGED 4713 (I) International Programs in Agricultural Education and Extension. World hunger and its root causes. The function of international agriculture organizations and the development of the world food system. Co-operative extension and the principles of feasibility analysis. Implications of agricultural education for the world of teaching secondary agricultural education with a focus on the role and importance of the comprehensive agricultural education program. Observation of teachers in an experiential manner by actively interviewing agricultural education teachers, school principals, and appropriate state staff; assisting with FFA activities; and observing students’ SAE opportunities.

AGED 4803 (I) International Study Tour in Agricultural Education. Prerequisite(s): Consent of instructor. An experiential learning course featuring an international travel component. Provides an integrated approach to studying the agriculture, education, natural resources, culture, history, government, economy, and religion of a particular region. Special emphasis placed upon formal and informal educational programs focusing on agriculture and natural resources.

AGED 4990* Seminar and Problems in Agricultural Education. 1-3 credits, max 6. Small group and/or individual study and research in problems relating to programs of educational agriculture in agriculture.

AGED 5000* Research and Seminar. 1-6 credits, max 6. Independent research and thesis under the direction of a major professor.

AGED 5010* Orientation to Graduate Programs in Agricultural Education, Communications and Leadership. Prerequisite(s): Graduate standing. Orientation to graduate programs in agricultural education and communications including degree expectation, understanding scholarship, orientation to the discipline, introduction to research agendas, and identification of support systems. (Same course as AGCM 5010)

AGED 5020* Creative Component in Agricultural Education. Prerequisite(s): 5983 or equivalent; consent of instructor. Independent research or project management under the direction and supervision of a major advisor.

AGED 5123* Adult Programs in Agricultural and Extension Education. Determining adult needs, priorities, participation in educational activities, and
adoption of new ideas and practices. Designing, organizing, conducting, and evaluating adult education programs in agricultural and extension education.

AGED 5203  Grant Seeking. Prerequisite(s): Graduate standing or consent of instructor. External funding proposal development for foundation and government agencies. Conceptualizing projects, identifying funding sources, and developing proposals that follow RFP guidelines including a literature review, need for the project, approach, timeline and budget.

AGED 5500  Directing Programs of Supervised Experience. 1-3 credits, max 6. Prerequisite(s): 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.

AGED 5623  Volunteer Management in Agricultural and Extension Education. Prerequisite(s): Graduate standing. Concepts, theories and practices for managing and leading volunteers in an agricultural setting with an emphasis on recruiting, managing, and training in formal or non-formal educational settings.

AGED 5703  Cultural Competency for Working in Agricultural and Extension Education. Prerequisite(s): Graduate standing. Examination of strategies to increase intercultural intelligence, and cultural competence. Focus on concepts of cultural values and stereotypes, intercultural sensitivity, cultural differences, cultural transitions, and intercultural theories for agricultural and extension educators.

AGED 5803  International Study Tour in Agricultural Education for Graduate Students. Prerequisite(s): Consent of instructor. Experiential learning course for graduate students featuring an international travel component. Projects involve the teaching of practical skills in agriculture, education, natural resources, culture, history, government, economy, and religion of a particular region. Special emphasis placed upon formal and informal educational programs focusing on agriculture and natural resources.

AGED 5813  College Teaching of Agriculture and Natural Resources. Prerequisite(s): Consent of instructor. Facets of the teaching-learning process used to teach agriculture and natural resources in higher education including teaching methods, instructional skills, application of instructional technology, student motivation, and evaluation of learning.

AGED 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.

AGED 5863  Methods of Technological Change. Processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. Applicable to persons who work closely with people in formal and non-formal educational settings.

AGED 5900  Graduate Internship in Agriculture. 1-6 credits, max 6. Prerequisite(s): Admission to Master of Agriculture program; consent of graduate coordinator. Supervised full-time internship in agricultural education, government agency, industry, Cooperative Extension, or not-for-profit organizations.

AGED 5983  Quantitative Research Methods in Agricultural Education. Prerequisite(s): Graduate standing. A comprehensive examination of quantitative research methods including identifying a problem, data collection, statistical analysis, ensuring reliability and validity, and reporting.

AGED 5990  Problems in Agricultural and Extension Education. 1-3 credits, max 8. Securing and analyzing data related to special problems or investigation in designated areas of agricultural education.

AGED 5993  Data Analysis and Interpretation in Agricultural Education. Prerequisite(s): Graduate standing; 5963 or equivalent; REMS 5953 or equivalent. A course designed for Agricultural Education students, who have gathered or are gathering data for a research study, to analyze and interpret that data. Both quantitative and qualitative data analysis techniques will be studied. The discovery method will allow the students and instructor to work together to identify sources and analyze and interpret the data sets.

AGED 6000  Research in Agricultural Education. 1-16 credits, max 16. Prerequisite(s): 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.

AGED 6100  Graduate Seminar in Agricultural Education. 1-3 credits, max 6. Discussion of issues, problems and trends in agricultural education.

AGED 6103  History and Philosophical Foundations of Agricultural and Extension Education. Prerequisite(s): Graduate standing. History and philosophical foundations of agricultural and extension education. Philosophy and its role in life, rise of education in America, philosophical foundations of education, and philosophical legislation having an impact on educational and extension education, education in agriculture and current issues in agricultural extension education.

AGED 6223  Program Evaluation in Agriculture and Extension. Prerequisite(s): Graduate standing. Program evaluation theory and methodology (quantitative and qualitative) presented through a service learning framework. Problem-based approach having students submit a proposal that addresses an evaluation need presented by a community-based program.

AGED 6983  Qualitative Research Methods in Agricultural Education. Prerequisite(s): Graduate standing. AGED 5983 or other graduate level social science research methods course. A comprehensive examination of qualitative research methods including identifying a problem, data collection, interpretative analysis, ensuring trustworthiness, theory construction and reporting.

Agricultural Leadership (AGLE)

AGLE 1511  Introduction to Leadership in Agricultural Sciences and Natural Resources. Introduction to the concept of leadership as a field of study. Emphasis placed on the application of acquired knowledge to practical problems.

AGLE 2303  Personal Leadership Development in Agricultural Sciences and Natural Resources. How leaders identify key attributes of leadership and link them to their own unique vision, values, and personal strengths.

AGLE 2403  (D)  Agricultural Leadership in a Multicultural Society. The study of leadership as it relates to a multicultural society. Cultural changes in the agricultural workplace and future impact on the industry. Personal barriers to fulfilling leadership roles in the agricultural sciences and natural resources. Skills related to managing teams in a diverse workplace specifically related to differences in gender, race and ethnicity.

AGLE 3101  Introduction to Agricultural Leadership. Prerequisite(s): Major in AGLE or consent of instructor. Exploring leadership in the context of agriculture. Specific topics will include authentic leadership, independent thinking, commitment to agriculture, open minds and professionalism. Graded on a pass/fail basis.

AGLE 3303  Agricultural Leadership: Theory and Practice. A study of the concepts and theories of leadership with emphasis on the development of leadership abilities in the individual for different group situations.

AGLE 3333  Contemporary Issues in Leadership. Prerequisite(s): AGLE 2303, 3303. Explore current issues in the study of leadership. Themes based on current leadership research that reveal new understandings of the leader’s role as a servant, facilitator and collaborator.

AGLE 3403  Facilitating Social and Technological Change in Agriculture. Examination of processes by which professional agriculturists influence the introduction, adoption, and diffusion of technological change.

AGLE 3503  Introduction to Cooperative Extension. Cooperative Extension mission, philosophy, history, organization, structure, administration, and program areas. Extension program development, Extension teaching and delivery methods, and the involvement and use of volunteers.

AGLE 3803  (I) Global Leadership in Agriculture. Contemporary global leadership in the context of agriculture. Challenges, cross-cultural conflict, managing diversity, and ethical behavior. Exploration of global leaders including Africans, Asians, Europeans, and Middle Easterners.

AGLE 4101  Seminar in Leadership Education. Prerequisite(s): AGLE 2303, 3303. In depth exploration of leadership topics related to agricultural sciences and natural resources.

AGLE 4203  Professional Development in Agriculture. Prerequisite(s): 3101; junior standing. Preparation of professionals in agricultural business and industry and related areas who have career goals directed toward service, leadership, management, communications, production, processing, marketing, and education outside the public school setting. Development of professionalism through leadership training, networking, interviews, community involvement, business correspondence, websites and the resume.

AGLE 4300  Agricultural Leadership Internship. 3-6 credits, max 6. Prerequisite(s): AGLE 3101, 4203 and consent of instructor. Supervised full-time internships in approved agribusinesses, governmental agencies or county extension offices. Requires written reports and a final presentation.

AGLE 4303  Facilitating Leadership Education Program. Prerequisite(s): AGLE 2303, 3303. Identification and application of methods and techniques for teaching leadership education programs in formal and non-formal educational settings. Focus on using experiential methods of teaching leadership.

AGLE 4803  International Agricultural Leadership Tour. An experiential study of the culture, agriculture and leadership in a region outside the United States. Contemporary leadership of the region and implications related to agriculture. Comparison of leadership and agricultural practices in the designated region to that of the United States. Includes a two-credit international travel component.

AGLE 4990  Problems in Agricultural Leadership. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Small group and/or individual study and research in problems related to agricultural leadership.

AGLE 5102  Creative Component in Agricultural Leadership and Extension Education. Prerequisite(s): Consent of instructor. Independent project under the direction and supervision of a major advisor. Creative component projects address an agricultural leadership and/or extension education issue with the goal to inform or improve practice based upon scholarship. Open to students pursuing a Master of Agriculture degree (M.Ag.) with an option in Agricultural Leadership.

AGLE 5303  Foundations of Leadership Theory. Study of leadership theory including definitions of leadership, a history of modern leadership theory,
and current trends in leadership practice and research. Models of leadership including contingency models, situational leadership and transformational leadership.

AGLE 5353* Leadership in Agriculture. Prerequisite(s): 5303 or consent of instructor. Concepts, principles, and philosophies of leadership applied to agricultural contexts. Importance of traits, perceptions, and behaviors to success of agricultural professionals in leadership roles. Dimensions and style of leadership for varying situations.

AGLE 5990* Problems in Agricultural Leadership and Extension Education. Prerequisite(s): Consent of instructor. 1-3 credits, max. 6. Investigation in designated areas of agricultural leadership and/or extension education.

AGLE 6203* Extension Program Development. A systematic study of the history, culture and functions of the Cooperative Extension System in America. Focus on program planning, including needs assessments, involvement of local constituent groups, use of the logic model, teaching methods, program evaluations, marketing and planning for the future.

Agriculture (AG)

AG 1011 First Year Seminar. Learning strategies, student success resources, advisement systems, co-curricular opportunities, degree requirements and career opportunities in various fields of agricultural sciences and natural resources. Required of all freshmen in the College of Agricultural Sciences and Natural Resources.

AG 1111 Career Exploration in Agricultural Sciences and Natural Resources. Application of the career planning cycle and detailed exploration of career opportunities in the agricultural industry and natural resources field.

AG 2890 Special Topics in Agricultural Sciences and Natural Resources. 1-3 credits, max. 6. Prerequisite(s): Consent of instructor. Individual and small group study or research in agricultural sciences and natural resources topics and issues.

AG 3010 Internships in Agriculture. 1-3 credits, max. 12. Prerequisite(s): Consent of instructor. Supervised internships with business, industry or governmental agencies, including cooperating veterinarians. Graded on pass-fail basis.

AG 3011 Transfer Seminar in Agricultural Sciences and Natural Resources. Resources, strategies and skills to facilitate transfer student success including academic advisement processes, university policies, degree completion plans, co-curricular opportunities and career connections. Professional networking and personal skill set development to support career objectives in agricultural sciences and natural resources.

AG 3080 International Experience. 1-18 credits, max. 36. Prerequisite(s): Consent of the associate dean of the college. Participation in a formal or informal educational experience outside of the USA.

AG 3090 (I) Study Abroad. 1-18 credits, max. 36. Prerequisite(s): Consent of the Study Abroad office and associate dean of the college. Participation in an OSU reciprocal exchange program or the OSU reciprocal exchange program.

AG 3111 Career Planning and Skill Development. In-depth application of career research and literature to the internship search, full-time job search, and graduate school application and decision-making processes, as related to the agricultural industry and natural resources field.

AG 3733 (H) Food and Culture. Interdisciplinary examination of the history and culture of food production and consumption in the U.S. with an emphasis on how U.S. foodways relate to those of other countries. Examines topics such as: food and the formation of social bonds, food and identity, the cultural meaning of foodways, issues of justice and equity in food production and consumption, and how food cultures have developed over time and in relation to other societies. Same course as AMST 3733 and HIST 3803.

AG 3803 (I) International Study Tour in Agricultural Sciences and Natural Resources. Prerequisite(s): Consent of instructor. A two-three week international travel component. An integrated approach to the study of agriculture, natural resources, culture, history, and technological advances of a region.

AG 4010 Honors Seminar. 1-6 credits, max. 6. Role of agriculture in society and adjustments to change in the economy.

AG 4890 Special Topics in Agricultural Sciences and Natural Resources. Prerequisite(s): Consent of instructor. Individual and small group study or research in agricultural sciences and natural resources topics and issues.

AG 4990 Special Problems in International Agriculture and Natural Resources. 1-3 credits, max. 6. Prerequisite(s): Consent of instructor. Individual and/or small group study or research on specialized problems or issues in international agriculture.

AGIN 5000* Master's Thesis/Report in International Agriculture. 1-6 credits, max. 6. For students working on a masters degree in International Agriculture. Independent research and thesis under the direction and supervision of a major professor.

AGIN 5312* Applied Issues in International Agriculture and Natural Resources. Prerequisite(s): Graduate standing or consent of instructor. Applied global issues in international agriculture and natural resource development, including sustainability, food security, trade, project evaluation, and international agricultural institutions. Written and oral reports and discussion of selected topics.

AGIN 5333* Guided Readings in International Agriculture and Natural Resources. Prerequisite(s): Graduate standing or consent of instructor. Understanding of international agriculture development objectives, challenges, and solutions to the most critical problems facing the developing world’s food and agricultural systems, through readings of a set of classic and contemporary books and constructing book reports.

AGIN 5353* Advanced Case Studies in Agricultural Marketing and International Development. Prerequisite(s): Consent of instructor. Advanced real world issues in marketing and international development of agricultural and food products. Development of an understanding of issues facing policy makers, producers, consumers, and other groups in examining the costs and benefits of various international marketing, trade and development programs.

AGIN 5800* International Agriculture Internship Experience. 1-6 credits, max. 12. Prerequisite(s): Graduate standing or consent of instructor. Students conducting an international internship experience, under the direction and supervision of a faculty member.

AGIN 5990* Advanced Studies in International Agriculture and Natural Resources. 1-12 credits, max. 15. Prerequisite(s): Consent of instructor. Individual or small group study and/or research in international agriculture and natural resources.

American Indian Studies (AMIS)

AMIS 2013 (D) Introduction to American Indian Studies. This course is designed to present an indigenous perspective to explore both the historical and contemporary issues facing Native American people. The course examines the history and development of American Indian Studies as an academic discipline and provides an introduction to the field employing a broad interdisciplinary approach. A range of topics are covered, including Native history, sociology, art, culture, literature, geography, law, and entrepreneurship.

AMIS 3713 (D) Native American Entrepreneurship. Analysis and presentation of economic issues specific to American Indian tribes, business enterprises, and entrepreneurial ventures in Indian country emphasizing the important distinction of American Indians as sovereign nations. This course offers a wide variety of opportunities for learning, including in-class exercises, class projects, and American Indian guest speakers with a range of business backgrounds and entrepreneurial experience (e.g., tribal and private enterprises). Previously offered as EEE 3713.

AMIS 4013 (D) American Indian Sovereignty. Critically analyzes historical and contemporary experiences of American Indians in society. Examines the importance of tribal sovereignty for the sociopolitical, cultural, and religious rights of Native people. Federal Indian law provides a context for understanding historical and indigenous experience and informs understanding of the Native American perspective. Explores contemporary sovereignty issues and proposed solutions that impact American Indians in relation to broader American culture.

American Sign Language (ASL)

ASL 1115 American Sign Language I. Learners will use fingerspelling, signing, eye gazing, classifiers, mime, and facial expressions presented in context and through meaningful and experiential activities.

ASL 1225 American Sign Language II. Prerequisite(s): 1115 with grade of “C” or better or permission from instructor. Continuation of 1115.

ASL 2115 American Sign Language III. Prerequisite(s): 1225 with grade of “C” or better or permission from instructor. Intermediate level study of American Sign Language. Same course as ASL 2113.

ASL 2225 American Sign Language IV. Prerequisite(s): 2115 with grade of “C” or better or permission from instructor. Continuation of 2115. Same course as ASL 2233.

ASL 3503 Linguistics of American Sign Language. Prerequisite(s): ASL 2225 and instructor’s permission. Readings on the most current linguistic and groundbreaking concepts including the fundamentals of phonology, morphology, syntax, semantics, and the use of language.

ASL 3630 Ethics for Interpreters. Prerequisite(s): ASL 2225 and instructor’s permission. This class will help learners understand the purpose, obligations, and consequences of being an interpreter. Preparation to take the State of Oklahoma Quality Assurance Screening Test.

American Studies (AMST)

AMST 2103 (D,H) Introduction to American Studies. Interdisciplinary study of American civilization through case studies of four different time periods in order to understand the multiple roles of culture in American life.

AMST 3253 (H) Globalization and American Culture. Transmission, reception, and influence of American culture in one or more of the following: Europe, Asia, Latin America, the Middle East. The cultural history of globalization and American culture.

AMST 3333 (S) Crime, Law and American Culture. Study of crime, law and the legal system from a cultural perspective. Examine how race, gender, and social class play different roles in issues related to crime, law and the legal system.

AMST 3423 (H) American Popular Culture. History of American popular culture and its role in shaping social behaviors, beliefs, and relations, especially as regards issues of race, class, gender, sexuality and social power.

AMST 3473 (D) Race, Gender, and Ethnicity in American Film. A survey of race, gender, and ethnicity as they have been represented in American films. Same course as ENGL 3473.

AMST 3503 (DH) Television and American Society. Examination of television within the social and cultural context of the U.S. Looks at the aesthetic and industrial practices that shape representation on TV and the effects of those practices, particularly for socially disempowered groups. Same course as ENGL 3503.

AMST 3513 (H) Film and American Society. Examination of U.S. film in its social, political, economic, and cultural contexts. Topics may include the history of U.S. film production, distribution and consumption; Hollywood film genres; independent cinema; the star system; and/or representations of historical events, political issues, or social groups in U.S. film.

AMST 3550 The Arts and American Society. 3 credits, max 6. Interdisciplinary study of major figures, trends, themes, periods, and modes of representation in American thought and cultural expression. Emphasis on the relationship between the arts and social, political, and historical context. Examples include Realism, American Modernism, Regionalism, American Postmodernism, the City and the Country, the Other, Nationalism, Time, and Space. Topics vary by semester.

AMST 3653 (D,H) The Body in American Culture. The body and its impact on American culture examined through a survey of diverse cultural productions and social practices. Examine the intersections of ideas of embodiment with discourses of race, class, gender, sexuality, disability, and nationalism.

AMST 3673 (D,H) History of American Art. Visual arts in America from the Colonial period to present. Major styles, ideas and uses of material in architecture, painting, sculpture and design. (Same course as ART 3663).

AMST 3683 Culture in the Making. Applied cultural analysis. Practical instruction in the use of cultural tools and technologies to tell American stories. Students will create hands-on projects in public culture using the artistic and historical resources available in the community.

AMST 3723 (D,H) Cultural History of American Sports. Examines the role of sports in American cultural history; analyzes issues of class, ethnicity, gender, nationalism and race; interprets the importance of athletic heroes, fans, performance, and rituals; evaluates amateur, collegiate, Olympic, and professional institutions.

AMST 3743 (D,H) Harlem Renaissance. This course will examine the Black cultural movement of the 1920s and 1930s. Evolving in Harlem, New York, it affected the United States, Europe, the Caribbean, and Africa. This course will examine the impact of this period on the arts, class, culture, gender, leisure, literature, music, sports, and racial and social equality in the United States. Weekly reading assignments, primary documents, and interdisciplinary material will be used to understand both the cultural and historical significance of this period.

AMST 3803 (H) War in American Culture. Study of war and its impact on American culture through an examination of diverse cultural productions and social practices. Emphasis on the circulation of common (and contested) representations of war within American visual, literary, and memorial culture.

AMST 3813 (D,H) Readings in the American Experience. Life in the New World from the colonial to the postmodern era using a multiplicity of interdisciplinary texts that demonstrate the emergence and ongoing evolution of distinctive American identities. (Same course as ENGL 3813)

AMST 3823 (D,H) U.S. As Business Culture. Examines American business in relation to political, social, and cultural phenomena, emphasizing the implications of business for race, class, gender and nation. Themes considered may include business ethics, social responsibility, film, documentary, and other forms of popular cultural criticism. The course examines changes in business and business culture over time, and offers students opportunities to synthesize sources that are not usually considered together.

AMST 3950 Special Topics in American Studies. 3 credits, max 12. Particular topics (popular culture, regionalism, myth, subcultures, race, ethnicity) to illustrate the use of interdisciplinary methods in American studies.

AMST 3980 Inquiry in American Studies. 1-3 credits, max of 9. For students interested in pursuing a research or reading project. Open to honors students in American Studies and to others by permission of the program head.

AMST 4553 (D) Gender in America. Cultural, societal and political reflections of American men and women from the colonial era to the present. Examination of the women’s movements and their opponents. Exploration of changing notions of masculinity and femininity. (Same course as HIST 4553)

AMST 4593 (H) America in International Perspective. Prerequisite(s): HIST 1103 or lower-division survey course in U.S. History, any period. A transnational interpretive history of American society from the colonial era to the present day. Uses a variety of interdisciplinary tools to place the history of the United States within a comparative, global framework. (Same course as HIST 4593)


AMST 4973 Senior Seminar in American Studies. Prerequisite(s): 3223. Writing of senior thesis based on original research and its analysis and evaluation or completion of independent project based on practical community experience.

AMST 4990 Internship. 1-3 credits, max 6. An internship opportunity which combines independent study and practical fieldwork experience focusing on a particular problem or topic related to American culture and experience. (Examples: Internship in Archival Fieldwork, Material Culture Fieldwork, Museum Management, Sound Recordings and Native American Heritage Site).

Animal Science (ANSI)

ANSI 1111 Animal and Food Science Experience. Student development through connections among the student’s major curriculum, career goals specific to animal or food science, and eventual careers and career development through resume building and networking.

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.

ANSI 2112 Live Animal Evaluation. Lab 4. Prerequisite(s): 1124. Using tools for selection including performance records, pedigree information and visual appraisal, in the evaluation of cattle, swine, sheep, horses and poultry.

ANSI 2123 Livestock Feeding. Lab 2. Nutrients and their functions, nutrient requirements of the various classes of livestock; components of feed; methods of calculating feed stuffs and ration formulation. Not required of animal science majors.

ANSI 2233 The Meat We Eat. Overview of all animal, poultry, and fish protein sources used for human consumption, but focusing on red meat. Examination of each phase of production, inspection, safety, grading, processing, preparation, and current issues of the industries. Development of an understanding of the importance of meat in the diet and part of global agriculture. Same course as FDSC 2233.

ANSI 2253 Meat Animal and Carcass Evaluation. Lab 2. Prerequisite(s): 1124. Evaluation of carcasses and wholesale cuts of beef, pork, and lamb. Factors influencing grades, yields and values in cattle, swine and sheep. (Same course as FDSC 2253)

ANSI 3212 Advanced Dairy Cattle Evaluation. Lab 4. Advanced evaluation of type traits as they relate to longevity and profitability in the dairy cow.


ANSI 3232 Advanced Meat Evaluation. Lab 4. Prerequisite(s): 2253. Advanced evaluation of carcasses and wholesale cuts of beef, pork and lamb. (Same course as FDSC 3232)


ANSI 3310 Advanced Competitive Evaluation. 2 credits, max 6. Lab 6. Prerequisite(s): Consent of instructor. Advanced instruction in animal and/or product evaluation. For students competing on collegiate judging teams. (Same course as FDSC 3310)


ANSI 3322 Applied Meat Animal Selection. Lab 6. Prerequisite(s): 3310 and consent of instructor. Applied selection of meat animals using principles of genetics, animal breeding, and phenotypic evaluation in real world selection scenarios to predict the value of breeding and market livestock.

ANSI 3333* Meat Science. Lab 3. Prerequisite(s): 2253, CHEM 1215 or equivalent. Anatomical and basic chemical and physical characteristics of meat animals studied. The application of scientific principles to the processing and economical utilization of meat animals, as well as in the manufacture of meat products emphasized in the laboratory. (Same course as FDSC 3333)

ANSI 3402 Equine Training Methods. Lab 4. Basic techniques of equine training. Performance of various maneuvers including halter breaking, saddling, longeing, driving, and riding.

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ANSI 3410 Peer-Led Team Learning in Animal Science. Prerequisite(s): Consent of instructor, 1-6 credits, max 6. Lab 1-5. Selected undergraduate students work as peer leaders for learning teams for Animal Science courses. Development of oral and written communication skills of technical concepts in animal science. Duties include meeting regularly with discussion and laboratory sessions, participating in instructional activities and evaluating class performance.

ANSI 3414 Form and Function of Livestock and Poultry. Lab 2. Prerequisite(s): 1124 and BIOL 1114 or consent of instructor. Form and function of living systems and their functions within systems (muscle, skeletal, neural, endocrine, cardiovascular, respiratory and gastrointestinal) with emphasis on comparative anatomy and integrated function related to livestock in agricultural production systems.

ANSI 3420 Undergraduate Research in Animal and Food Science. Lab 2. Designed for students participating in undergraduate research in Animal and Food Sciences. Students actively participate in research methodologies, including foundational research theories and protocols.

ANSI 3423* Animal Genetics. Prerequisite(s): Introductory biology. The basic principles of heredity including: rules of gene action, random segregation, independent assortment, physical and chemical basis of heredity, mutations, sex-linkage, chromosome mapping, multiple alleles and chromosomal aberrations. Also a brief introduction to quantitative inheritance and population genetics.

ANSI 3433* Animal Breeding. Lab 2. Prerequisite(s): 3423. The application of genetic principles to livestock improvement; study of the genetic basis of selection and systems of mating; development of breeding programs based on principles of population genetics.


ANSI 3453 Canine and Feline Genetics. Prerequisite(s): BIOL 1114 or consent of instructor. Overview of fundamental genetic principles and the control of genetic variation in coat color, various disorders and other inherited feline and canine characteristics. Inherited conditions, the underlying genetic mutation if known, genetic tools used to identify the mutations if unknown, and development of genetic tools to assist in canine and feline genetic testing and selection programs.

ANSI 3463 Equine Genetics. Basic Mendelian genetics with direct application to horses. Genetic principles and inheritance of particular equine characteristics and common genetic disorders.

ANSI 3523 Pet and Companion Animal Management. Current concepts and management principles related to pet and companion animal species and their roles in society. Discussion of the human-animal bond, service animals, kennel and cattery management, anatomy, internal and external parasites, toxins, restraint and handling, training, reproduction, nutrition, genetics, and breeding.

ANSI 3533 Equine Management and Production. Current topics and trends in the horse industry. Basic principles of equine nutrition, reproduction, marketing, exercise physiology, health care, coat-color genetics, behavior and welfare.

ANSI 3543 Principles of Animal Nutrition. Prerequisite(s): CHEM 1215 or equivalent. Basic principles of animal nutrition including absorption, metabolism of food nutrients, characteristics of the nutrients, measure of body needs; ration formulation.

ANSI 3563 Livestock Behavior and Handling. Prerequisite(s): 1124. Livestock behavior and handling in production agriculture.

ANSI 3563* Applied Animal Nutrition. Lab 2. Prerequisite(s): 3543. Composition, characteristics and nutritive value of feeds and ration additives; qualitative and quantitative nutrient requirements of each of the classes of livestock; formulation of rations for each of the classes of livestock.

ANSI 3703 Animal Management Techniques. Lab 4. Animal handling and management practices. Basic husbandry procedures for domestic animals in farm, ranch, and/or other production settings or environments. Emphasis on practical handling, restraint, health evaluation, medication and treatment practices.

ANSI 3753 Basic Nutrition for Pets. Nutrients, nutrient requirements, feeding practices, food sources, and diet management for pets and companion animals as well as exotic animals and birds.

ANSI 3903 (I) Agricultural Animals of the World. The production and utilization of agricultural animals by human societies.

ANSI 4023 Poultry Science. Lab 2. Prerequisite(s): 1124 and 2123 or 3543. The relationship of the biological concepts and functions of poultry to management practices, incubation procedures, and economic factors utilized by poultry men in the commercial production of table and hatching eggs, broilers, turkeys, and other poultry meat.

ANSI 4123 Welfare Assessment and Audit of Farm Animals. Prerequisite(s): 4122. Reliable, science-based, on-farm and slaughter welfare assessment systems for cattle, pigs and poultry as well as a methodology to convey welfare measures into understandable product information.

ANSI 4203 Rangeland and Pasture Utilization. Lab 2. Prerequisite(s): RLEM 3913 or 4613. Investigation of livestock and forage interactions that impact productivity in the utilization of rangeland and improved pastures.

ANSI 4333* Processed Meat. Lab 3. Prerequisite(s): 3033 or 3333. Meat and meat product composition. Techniques in the molding and forming of meat; seasonings, formulation; curing; quality control; and cost analysis. (Same course as FDSC 4333*)

ANSI 4423 Horse Science. Lab 2. Prerequisite(s): 3433, 3443 and 3653. Current concepts and production principles related to the horse industry including nutrition, reproduction, herd health, functional anatomy and implications, social behavior, and applying principles of psychology in horse management and training.

ANSI 4543* Dairy Cattle Science. Lab 2. Prerequisite(s): 3433, 3443 and 3653. Current concepts and production principles of the dairy cattle industry including use of milk products, milk marketing, physiology of lactation, reproduction, nutrition, mastitis, and housing. Analysis and active learning of dairy production systems using farm visits and field techniques laboratories.

ANSI 4553* Sheep Science. Lab 2. Prerequisite(s): 3433, 3443 and 3653. Breeding, feeding, management, and marketing of commercial and purebred sheep.

ANSI 4613* Beef Cow-Calf Management. Lab 2. Prerequisite(s): 3433, 3443, and 3653. Application of farm and ranch land procurement and management principles with beef cattle acquisition, breeding, nutrition, reproduction, health, life cycle management, and economic analysis of the commercial cow-calf enterprise.

ANSI 4633* Stocker and Feedlot Cattle Management. Lab 2. Prerequisite(s): 3433, 3443, and 3653. Application of scientific knowledge, management principles, and research advances to modern stocker and feedlot cattle operations.

ANSI 4643* Swine Science. Lab 2. Prerequisite(s): 3433, 3443 and 3653. Application of genetic, physiological, microbiological, nutritional, and engineering principles to the efficient production of swine.

ANSI 4703* Equine Enterprise Management. Prerequisite(s): 3433 and 3443 and 3653. Principles of equine enterprise management including ethical and legal issues, marketing, facility management, business structures, economic analysis and careers.

ANSI 4713 Beef Seedstock Management and Sales. Lab 2. Prerequisite(s): 3433, 3443, and 3653. Principles of beef cattle seedstock acquisition, breeding, nutrition, reproduction, health, life cycle management and economic analysis. Special emphasis on advertising, promotion, marketing and sales.

ANSI 4803* Animal Growth and Performance. Prerequisite(s): An upper-division course in animal science. Physiological and endocrine factors affecting growth and performance of domestic animals.

ANSI 4843 Applications of Biotechnology in Animal Science. Lab 3. Prerequisite(s): 3423 and BIOL 3653. Training in current biotechniques used in production, extension, and Food Sciences. Students actively participate in research methodologies, participating in instructional activities and evaluating class information.

ANSI 4863 Capstone for Animal Agriculture. Lab 2. Prerequisite(s): Senior standing. Examination of the role of animal agriculture in society and the importance of research and current issues. Oral and written reports.

ANSI 4900 Special Problems. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. A detailed study of an assigned problem by a student wishing additional independent work. Subject determined in consultation with a major professor.

ANSI 4910* Animal Industry Internship. 1-12 credits, max 12. Prerequisite(s): Consent of instructor. Full-time internship at an approved production, processing or agribusiness unit or other agency serving animal agriculture. Maximum credit requires a six-month internship in addition to a report and final examination. Graded on a pass-fail basis.

ANSI 4913* Animal Waste Management. Prerequisite(s): SOIL 2124. Aspects of animal waste management related to animal nutrition, system design, land application, socioeconomic issues and environmental impacts. (Same course as SOIL 4913, ENVR 4913)

ANSI 4973 Rangeland Resources Planning. Lab 3. Prerequisite(s): 3812 and AGRON 4954. Inventory or ranch resources, survey and evaluation of ranch practices, and economic analysis. Development of a comprehensive ranch management plan. Managing rangeland and ranch resources in a social context. Written and oral reports. Field trips required. (Same course as NREM 4613)

ANSI 5000* Master's Research and Thesis. 1-6 credits, max 6. Prerequisite(s): MS degree. Independent research planned, conducted, and reported in consultation with a major professor.

ANSI 5010* Special Problems. 1-3 credits, max 6. Special problems in areas of animal science other than those covered by the individual graduate student as a part of his/her research and thesis program.

ANSI 5102* Ethics and Professionalism in Animal and Food Science. Discussion of regulations, laws, and resources; insights on complex ethical issues, including but not limited to research misconduct, how to address, report and find resources when cases of misconduct, conflicts of interest, and authorship; communication of research accurately and objectively to different audiences. Same course as FDSC 5102*.
Prerequisite(s): 3443 or Design, planning, and building 1-4 credits, max 4. Beginning studies in Lab 16. Architectural graphics Lab 2. Prerequisite(s): 3653. Prerequisite(s): BIOC 3653. 1-3 credits. Prerequisite(s): Lab 4. Prerequisite(s): Prerequisite(s): Prerequisite(s): BIOC 5753. Modern indigenous peoples of methods of research in the area of animal science. Review of the literature, breeding and population genetics. ANSI 6010* Special Topics in Animal Breeding. 1-3 credits. Prerequisite(s): Consent of instructor. Instruction through ethnographic or archaeological field techniques by participation in a field program. Topics subject to change from year to year depending upon the type of field program offered or available. ANSI 4123 (S) Anthropology (ANTH) ANTH 2353 (N) Introduction to Biological Anthropology. Introduction to human biological evolution, including genetics, paleoanthropology, primatology, and osteology. ANTH 2883 (S) Introduction to Archaeology. A general introduction to the methods of study of archaeology. Understanding the development of prehistoric cultures as adaptive responses to changing natural and social environments from early Paleolithic to emergence of urban civilizations. ANTH 3353 (I,S) Cultural Anthropology. Introduction to culture, various subdisciplines of cultural anthropology, anthropological concepts, and capsule ethnographies of assorted ethnic groups. ANTH 3443 (I,S) Peoples of Mesoamerica. Modern indigenous peoples of Mexico and Central America. Examination of contemporary communities and modern social and cultural practices understood from a historical perspective, leading to an appreciation of regional similarities and diversity. ANTH 3990 Fieldwork in Anthropology. 1-8 credits, max 8. Prerequisite(s): Consent of instructor. Directed readings or research on significant topics in anthropology. ANTH 5243* Globalization and Culture. Prerequisite(s): Admission to Graduate College and International Studies. Critical assessment of 20th century social scientific theories of development culminating in current theories of globalization. Exploration of capitalism’s antecedents, origin, and proliferation. Evaluation of global inequality from a cross-culture perspective. Utility of anthropological theories of culture, ideology and hegemony in assessing local responses to globalization. No credit for students with credit in INTL 5243. ANTH 5990* Advanced Problems and Issues in Anthropology. 1-9 credits, max 9. Prerequisite(s): Consent of instructor. Group enrollment or individual research enrollment as needed. Graduate level analysis of special problems and issues in Anthropology not covered in other department offerings.

Architecture (ARCH) ARCH 1112 Introduction to Architecture. An introduction to the professions of architecture and architectural engineering. ARCH 1216 Architectural Design Studio I. Lab 16. Architectural graphics and design fundamentals. Students who have not received a grade for 1216 will be given first priority in enrollment. Students who have received a grade in this course will be admitted on a space available basis and at the discretion of the school head and architecture advisor. ARCH 2003 (H,I) Architecture and Society. Design, planning, and building considered in their social and aesthetic contexts. Some sections may be restricted to Architecture and Architectural Engineering majors, see course offerings. ARCH 2100 Architectural Studies. 1-4 credits, max 4. Beginning studies in graphics and design in architecture. ARCH 2116 Architectural Design Studio II. Lab 16. Prerequisite(s): Grade of “C” or better in 1216. Students who have not received a grade for 2116 will be given first priority in enrollment. Students who have received a grade in this course will be admitted on a space available basis and at the discretion of the school head and architecture advisor. ARCH 2203 History and Theory of Architecture Since 1900. Prerequisite(s): 2003 or consent of instructor. History and theory of world architecture in the 20th century and beyond. ARCH 2216 Architectural Design Studio III. Lab 16. Prerequisite(s): Grade of “C” or better in 2116 and 2116. Problems in architectural design. Students who have not received a grade for 2216 will be given first priority in enrollment. Students who have received a grade in this course will be admitted on a space available basis and at the discretion of the school head and architecture advisor. 2016-2017 University Catalog
ARCH 2263 Building Systems. Prerequisite(s): Grade of "C" or better in 1216 and 2116. Architectural, structural, and environmental control systems.

ARCH 3083 (H) History and Theory of Baroque Architecture. Prerequisite(s): 2003. History and theory of renaissance architecture in the western world, particularly the later Baroque period.

ARCH 3100 Special Topics in Architecture. 1-6 credits, max 12. Subjects to be selected by the faculty in architecture from advances in state-of-the-art areas.

ARCH 3116 Architectural Design Studio IV. Lab 16. Prerequisite(s): Grade of "C" or better in 2216 and admission to third year. Problems in architectural design.

ARCH 3134 Architectural Science I: Thermal Systems and Life Safety. Lab 2. Prerequisite(s): MATH 1513 or 1715. A survey of the fundamentals of thermal comfort and energy concerns and mechanical systems for buildings as well as the basic principles of life safety.

ARCH 3143 Structures: Analysis I. Lab 2. Prerequisite(s): Grade of "C" or better in ENSC 2143. Structural theory for applications in architecture.

ARCH 3173 History and Theory of American Architecture. Prerequisite(s): 2003 or consent of instructor. History and theory of American architecture from the colonial period to the present day.

ARCH 3216 Architectural Design Studio V. Lab 16. Prerequisite(s): Grade of "C" or better in 3116, 3252. Problems in architectural design.

ARCH 3223 Structures: Timbers. Lab 2. Prerequisite(s): Grade of "C" or better in 3233. Analysis and design of timber structures used in architecture.

ARCH 3224 Structures: Steel II. Lab 2. Prerequisite(s): Grades of "C" or better in 3233 and 3143. Design and analysis of multi-story steel frames, trusses, arches, and other architectural structure components.

ARCH 3252 Computer Applications in Architecture I. Prerequisite(s): Grade of "C" or better in 2216 and admission to professional school. Introduction to 2D and 3D computer topics and their application in the design process. No credit for students with credit in 2533.

ARCH 3262 Computer Applications in Architecture II. Prerequisite(s): Grade of "C" or better in ARCH 3252 and concurrent enrollment in ARCH 3216 or ENGR 1412 and admission to professional school. State-of-the-art applications of computers to the practice of architecture and architectural engineering.

ARCH 3263 Materials in Architecture. Prerequisite(s): Grade of "C" or better in 2263 and admission to third year. Introduction to the basic materials used in the construction of architecture and how such materials affect both the design and implementation of the systems that incorporate these materials.

ARCH 3273 History and Theory of Medieval Architecture. Prerequisite(s): 2003 or consent of instructor. History and theory of the architecture created between the 8th and 15th centuries in Europe, and its impact on the subsequent religious architecture of today.

ARCH 3323 Structures: Steel I. Prerequisite(s): Grade of "C" or better in ENSC 2113 and admission to the professional program, or permission of school head and adviser. Analysis and design of steel structures used in architecture.

ARCH 3353 Advanced Graphics and Theory of Representation. Lab 2. Prerequisite(s): Admission to Professional School or consent of instructor. Manual and digital graphic techniques are explored in a project-based studio learning environment.

ARCH 3370 Urban USA Field Study. 2-3 credits, max 3. Prerequisite(s): Admission to Professional School. On-site analysis and study of urban design, culture, and urban design of major urban centers in the USA.

ARCH 3433 Architectural Science II: Acoustics and Lighting. Prerequisite(s): MATH 1513 or 1715. A survey of architectural acoustics, electrical, and lighting systems for buildings.

ARCH 3442 Computer Applications in Architectural Engineering. Lab 2. Prerequisite(s): Admission to the professional program, co-requisite enrollment in 3252. Computer applications in architectural engineering introducing computer programming and the use of commercial analytical software.

ARCH 4073 History and Theory of Early Modern Architecture. Prerequisite(s): 2003. History and theory of modern architecture in the western world from the industrial revolution to the early twentieth century.

ARCH 4093 Architectural Project Management. Prerequisite(s): Concurrent enrollment in 4216 or 5226 or consent of instructor. Principles of management as applied to architectural and architectural engineering projects.

ARCH 4100 Special Topics in Architecture. 1-6 credits, max 12. Prerequisite(s): Consent of instructor and head of the school. Subjects to be selected by the faculty in architecture from advances in state-of-the-art areas.

ARCH 4116 Architectural Design Studio VI. Prerequisite(s): Grade of "C" or better in 3216 and 3262. Problems in architectural design.

ARCH 4123 Structures: Concrete I. Prerequisite(s): Grade of "C" or better in 3233. Analysis and design applications in architectural problems using concrete structure components.

ARCH 4134 Architectural Science I: Thermal Systems and Life Safety for Architectural Engineers. Prerequisite(s): ENSC 2213 or concurrent enrollment.

Engineering based fundamentals of thermal comfort, energy concerns, and mechanical systems for buildings, as well as the basic principles of life safety.

ARCH 4143 Structures: Foundations for Buildings. Prerequisite(s): Grade of "C" or better in 4123. Interaction of frames and supports for structures used in architecture. Subsurface conditions and design of foundation systems and retaining walls for buildings.

ARCH 4173 History and Theory of Skyscraper Design. Prerequisite(s): 2003 or consent of instructor. History and theory of the development of the skyscraper in the USA from the late 19th century to the present.

ARCH 4183 History and Theory of Architecture: Cities. Prerequisite(s): 2003. The development of cities as an aspect of architecture from ancient times to the twentieth century.

ARCH 4216 Architectural Design Studio VII. Prerequisite(s): Grades of "C" or better in 3134, 3433, 4116, and 4123. Concurrent enrollment in 4263. Problems in architectural design.

ARCH 4224 Structures: Concrete II. Prerequisite(s): Grade of "C" or better in ARCH 4123, ARCH 4143 and ENGR 1412. Design and analysis of multi-story reinforced concrete frames and prestressed and post-stressed concrete structural components used in architecture applications.

ARCH 4233 Sustainable Design in Architecture. Prerequisite(s): Grade of "C" or better in ARCH 3134. Sustainability topics and their application to architecture.

ARCH 4263 Architecture Seminar. Prerequisite(s): Concurrent enrollment in 4216 or 5226. Topics in architecture and architectural engineering.


ARCH 4293 (H) The Ethics of the Built Environment. Prerequisite(s): Admission to the professional program or consent of instructor. Analysis of basic values that determine the form of the built environment.

ARCH 4373 Field Study in Europe I. Prerequisite(s): Senior standing in architecture or consent of instructor. On-site analysis and study of European architecture, culture, and urban design.

ARCH 4374 International Field Study. Prerequisite(s): Admission to Professional Program in Architecture or Architectural Engineering or approval of instructor and head of school. On-site analysis and study of international architecture, culture and urban design.

ARCH 4433 Architectural Science II: Acoustics and Lighting for Architectural Engineers. Prerequisite(s): ENSC 2613 or concurrent enrollment. Engineering based fundamentals of architectural acoustics and electrical/lighting systems for buildings.

ARCH 4444 Structures: Analysis II. Prerequisite(s): Grade of "C" or better in ARCH 3143, ENGR 1412, and MATH 3283. Mathematical formulation of architectural structural behavior. Matrix applications, finite element, finite differences, stability considerations and three dimensional structural modeling.

ARCH 5023 Masonry Design and Analysis. Prerequisite(s): Grade of "C" or better in 4123. Analysis and design of low-rise masonry structures and multi-story masonry shear walls, including code requirements, analysis techniques, design of components, and detailing of architectural engineering contract documents conforming to the relevant codes.

ARCH 5093 Real Estate Development. Prerequisite(s): Admission to professional program or consent of instructor. Introduction to real estate development as a function of project conception, analysis, design and delivery. Same course as EEE 5200.

ARCH 5100 Special Topics in Architecture. 1-6 credits, max 12. Prerequisite(s): Consent of instructor and head of the school. Subjects to be selected by the faculty in architecture from advances in state-of-the-art areas.

ARCH 5117 Architectural Design Studio VIII. Lab 16. Prerequisite(s): Grade of "C" or better in 4216 or permission of school head or adviser. Problems in architectural design.


ARCH 5193 Management of Architectural Practice. Prerequisite(s): 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.

ARCH 5217 Architectural Design Studio IX. Lab 16. Prerequisite(s): Grade of "C" or better in 5117 or consent of instructor. Problems in architectural design.

ARCH 5226 Architectural Engineering Comprehensive Design Studio. Lab 16. Prerequisite(s): Grade of "C" or better in 5316, 5224, 4134, 4224, and 4433. Problems in architectural and architectural engineering design.

ARCH 5373* Field Study in Europe II. Prerequisite(s): Senior standing in architecture or consent of instructor. On-site analysis and study of European architecture, culture, and urban design.

ARCH 5493 Entrepreneurship and Architecture. Prerequisite(s): Senior
standing. Introduction to entrepreneurship within the context of architecture, with direct application to architectural services, activities, and products. Emphasis on implementing the entrepreneurial process in starting and sustaining new ventures that significantly shape the built environment. (Same course as EEE 5493).

ARCH 6000* Special Problems. 1-15 credits, max 15. Lab 3-18. Prerequisite(s): 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.

ARCH 6083* History and Theory of Contemporary Architecture. Prerequisite(s): Graduate standing or consent of instructor. American architecture beginning in the 16th century through the 20th century.

ARCH 6117* Graduate Design Studio I. Lab 20. Prerequisite(s): Admission to graduate program. Problems in architectural design.

ARCH 6203* Creative Component in Architectural Engineering. Lab 6. 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.

ARCH 6207* Creative Component in Architecture. Lab 20. Prerequisite(s): 6117. A design project based on a program previously developed by the student to include written report and supportive documents when appropriate. Must be approved by the project adviser and completed in the final semester of the graduate program.

ARCH 6243* Structures: Analysis III. Prerequisite(s): Grade of "C" or better in 4444 and admission to the graduate program. Analysis techniques for architectural structures including stability, space frames, computer applications, gusseted towers and project research.

ARCH 6343* Structures: Steel III. Prerequisite(s): Grade of "C" or better in 3224. Plastic analysis and design of structural steel frames utilizing load and resistance factor design.

ARCH 6543* Structures: Concrete III. Prerequisite(s): Grade of "C" or better in 4224. Design of prestressed concrete structures, including pre-and post-tensioning.

Art (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.

ART 1113 Drawing II. Lab 6. Prerequisite(s): 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.

ART 1203 Two-Dimensional Foundations. Lab 6. Introduction to visual problem solving and two-dimensional media. Organization to the two-dimensional plane; line, shape, value and texture. Color theory including hue, value and saturation.

ART 1303 Three-Dimensional Foundations. Lab 6. Prerequisite(s): 1103. Exploration of three-dimensional form and space stressing organization of design elements, development of concepts, and manipulation of materials. Investigation of linear space, modular ordering, mass/volume and color through projects of a conceptual and applied nature.

ART 1503 (H) Art History Survey I. The arts, artists, and their cultures from prehistoric times through the Early Renaissance. May not be used for degree credit with ART 1603.

ART 1513 (H) Art History Survey II. The arts, artists, and their cultures from the Early Renaissance to the present. May not be used for degree credit with ART 1613 or 2613.

ART 2003 Studio Methods and Preparation. Portfolio concept development including idea generation, sketchbook, analyzing and evaluating art criticism and select contemporary artists. Professional portfolio presentation, including matting, slide documentation, labeling and resume as a precursor to the sophomore review.

ART 2113 Life Drawing. Lab 6. Prerequisite(s): 1113. 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.

ART 2223 Oil Painting I. Lab 6. Prerequisite(s): 1113, 1203, 1303, 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.

ART 2233 Watercolor I. Lab 6. Prerequisite(s): 1113, 1203, 1303, or consent of instructor. The development of technical skills stressing color, form, and content. Assignments cover paper preparation and support, brush handling, pigment characteristics and mixing, and all basic dry surface and wet surface painting techniques.

ART 2243 Jewelry and Metals I. Lab 6. Prerequisite(s): 1113, 1303, or consent of instructor. Fabrication and forming techniques for non-ferrous metals. Cold joining, silver soldering, surface treatment and elementary stone setting. Applications toward either wearable or small scale sculptural format.

ART 2253 Ceramics I. Lab 6. Prerequisite(s): 1113, 1303, or consent of instructor. Introduction to basic building techniques including wheel throwing, coiling, and slab construction, as well as slip and glaze application and a variety of firing processes. Exposure to historical and contemporary references. Emphasis on personal growth through technique and concept.


ART 2273 Printmaking I. Lab 6. Prerequisite(s): 1113, 1203, 1303 or consent of instructor. Varied print processes, including monotypes, relief printmaking, and intaglio. Fundamental techniques of each medium that include inking, printing, editioning multiples, and both additive and subtractive approaches.

ART 2283 Studio Art Digital Survey. Lab 6. Prerequisite(s): 1103 and 1303 or 2423 and 2433 or by consent of instructor. This studio art course will cover the introduction to the tools and techniques of computerized digital technology. Students will work specifically with digital video, sound editing, digital photography, digital imaging and printing. Projects in the course will focus on fostering an introductory to intermediate level understanding of digital technology and formats, while allowing more advanced students to incorporate media of personal interest, such as performance, assemblage, projection, and installation, as well as other hybrid and emerging art forms.

ART 2293 Photography I. Prerequisite(s): ART 1103, ART 1203 and ART 1303, or consent of instructor. An introduction to the use of photography as an art form. Exploration of traditional and current photographic methods with an emphasis on creating a foundational understanding of the medium's core concepts and techniques. Students will shoot, process, and print their own images, which will be discussed in critique with reference to basic photographic theory.

ART 2403 Illustration I. Lab 6. Prerequisite(s): 1113 and 2.75 graduation/retention GPA. Introduction to historic and contemporary illustration and consideration of a wide range of illustrative styles. Required experiments with media and consideration of alternate ways of illustrating a message through color, line, tone, and composition. Assignments will cover narrative and figural imagery, which will be discussed in critique with reference to basic photographic theory.

ART 2413 Typography I. Lab 6. Prerequisite(s): ART 1103 and 2.75 graduation/retention GPA. An investigation of letter forms and their characteristics and a study of spacing, leading, type selection, layout alternatives, type specification, and copy fitting. Preliminary introduction to typography as a communication medium. An understanding of typographic terminology and measuring systems while developing hand skills and introducing computer technology.

ART 2423 Graphic Design I. Lab 6. Prerequisite(s): ART 1103 and 2.75 graduation/retention GPA. Exploration of basic design principles—line, form, and color, as visual communication. Problem solving, generation of ideas, development of concepts, and the integration of word and image. Technical and presentation skills.

ART 2433 Digital Design I. Lab 6. Prerequisite(s): ART 1103 and 2.75 graduation/retention GPA. Introduction to concepts, techniques and methods of using computer software to explore graphic design principles. Discussion of technology and media as applied to visual communication.

ART 2803 Introduction to Photography for Non-Majors. This course is an introduction to the technical and aesthetic properties of digital photography as an art form. Students will learn the basic technical aspects of photography using the DSLR camera as a creative tool. No previous experience with photography is required for this class. This course is intended for non-art majors; there are no prerequisites.

ART 3110 Life Drawing Studio. 3 credits, max 9. Lab 6. Prerequisite(s): 2113 or consent of instructor. 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.

ART 3213 Public and Installation Art. Prerequisite(s): ART 1303 or permission of instructor. Intermediate level course that offers students the opportunity to explore mixed media and multi-media art production through site-specific projects and site specific projects. Lectures will include an exploration of recent theoretical and historical examples. Students will have access to a tool shop with instruction and assistance provided. Projects are designed and created for sites outside of the classroom, allowing for individual exploration based upon interests.

ART 3223 Oil Painting II. Lab 6. Prerequisite(s): 2223 and proficiency review or consent of instructor. Oil Painting with emphasis on personal development of visual ideas and techniques.

ART 3233 Watercolor II. Lab 6. Prerequisite(s): 2233 and proficiency review or consent of instructor. Stresses continued growth of technical skills with an emphasis on the individual development of skills and imagery.
ART 3243 Jewelry and Metals II. Lab 6. Prerequisite(s): 2243 and proficiency review or consent of instructor. Development of technical skills and ideas through assigned projects. Metalworking processes include casting, advanced stone setting, hinge making, and forming of metal.

ART 3253 Ceramics II. Lab 6. Prerequisite(s): 2253 and proficiency review or consent of instructor. Focus on either hand building or throwing techniques. Development of personal expression and technical proficiency with the material and advanced firing and glazing processes. Emphasizing contemporary ceramic issues as well as broader art concepts.

ART 3263 Sculpture II. Lab 6. Prerequisite(s): 2263 and proficiency review. Non-ferrous metal casting. Basic welding techniques using oxy-acetylene, electric arc, and TIG methods. Emphasis on concepts, form, methods and materials.

ART 3273 Printmaking II. Prerequisite(s): 2273 and proficiency review or consent of instructor. Development of technical skills and ideas through assigned projects. Intaglio processes include aquatint, softground, and multiple color aquatint. Intaglio projects can be realized on stencils and multiblock. Litho techniques with permission of instructor.

ART 3293 New Genres in Studio Art. Prerequisite(s): 2293. This course is a continuation of the Studio Art Digital Survey course. New Genres is a continued, more advanced exploration of the concepts, techniques, and history of non-traditional forms of contemporary art. Students will work in experimental and interdisciplinary ways with non-traditional media such as video, sound, photography, performance, writing, assemblage, and installation.

ART 3383 Digital Imaging. Lab 6. Prerequisite(s): 2283 or 2423 and 2433 or by consent of instructor. This studio art course is a continuation of the concepts, tools and techniques related to digital technology. Students will work specifically with digital photography, digital imaging and printing. Projects in the course will focus on fostering an intermediate level understanding of digital technologies and alternate process printing formats, while allowing more advanced students to incorporate media of personal interest.

ART 3393 Photography II. Lab 6. Prerequisite(s): ART 2293, Photography I or consent of instructor. A further exploration of the creative opportunities in photography. Students will build on the basic understanding of the medium acquired in the introductory course, and respond to assigned aesthetic and conceptual problems. In this intermediate course, students will begin to articulate ideas visually and refine their technical skills in camera operation, digital imaging software, and large format printing.

ART 3403 Illustration II. Lab 6. Prerequisite(s): 2403, 2413, 2423 and portfolio review. Exploration of illustrative solutions to maximize visual interest via varied viewpoints, concepts and altered reality. Projects involving different career areas within the field of illustration. Requirements and advantages of each area.

ART 3413 Typography II. Lab 6. Prerequisite(s): 2403, 2413, 2423 and portfolio review. Exploration of typographic communication through a variety of problems. Type as the visual solution with emphasis on its functional, decorative, and creative applications. Solution of more complex typographic problems, dealing with a large body of information via the development of grid systems.

ART 3423 Graphic Design II. Lab 6. Prerequisite(s): 2403, 2413, 2423 and portfolio review. Use of computer and traditional methods to enhance production skills and solution of design projects from concept to the comprehensive. Evaluation and design of symbols and logos and their various applications, leading to an understanding of system design. Introduction to graphic design production and the preparation of art for reproduction.

ART 3453 Motion Design 1. Prerequisite(s): 2403, 2413, 2423 and portfolio review. Introduction to the basic concepts and techniques of motion design as visual communication. Students are introduced to the technical skills and critical thinking necessary for executing creative motion graphics intended to be experienced via electronic media, with an emphasis on typography, composition and design principles.

ART 3463 Interaction Design 1. Prerequisite(s): 2403, 2413, 2423 and portfolio review. Introduction to the techniques of interactive design as visual communication. Use of computer software to execute interactive design work intended to be experienced via electronic media, with an emphasis on typography, functionality and design principles.

ART 3543 (H) Leonardo, Art and Science. Explores the deeply entwined fields of Renaissance art and science through the lens of Leonardo. Examines the extraordinarily diverse body of work. This course will consider the broader context of anatomical study, alchemy, early modern medicine, technological innovation, and psychology.

ART 3553 (H) Fashioning and Self- Fashioning: The Renaissance Portrait. Explores the portraits created in Europe during the Renaissance. Addresses self-fashioning and artifice and the portrait as the collaborative product of artist, patron and subject.

ART 3573 History of Photography. Prerequisite(s): ART 1503 or ART 1513. This course surveys the history of photography from proto-photographic technologies of the 18th and early 19th centuries through contemporary digital practices.

ART 3583 (H) Introduction to Museum and Curatorial Studies. Historical and theoretical introduction to museum and curatorial studies. Topics include museum ethics, the function of the curator, and the changing role of the museum. Same course as ART 2643.

ART 3600 Writing Methods in Art History. 1 credit. Prerequisite(s): Consent of instructor. A supervised research and writing project, typically concurrent with enrollment in an upper-division art history course.

ART 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 development through the Roman world through architecture, sculpture, and painting.

ART 3623 (H) History of Italian Renaissance Art. Architecture, sculpture, and painting in Italy, c.1300-1580. Major artists in their local contexts (e.g. Leonardo in Milan, Michelangelo in Florence, and Titian in Venice).

ART 3633 (H) History of Baroque Art. Art in 17th century Europe. Architecture, sculpture and painting of the Catholic Reformation (e.g. Caravaggio and Bernini in Italy, Velasquez in Spain, Rubens in Flanders), concluding with painting in non-sectarian, Protestant Netherlands (Rembrandt and Vermeer).

ART 3643 History of Graphic Design. Evolution of graphic communication from prehistoric times to the present. Investigation of the origins of printing and typography in Europe leading to the design of the printed page, the impact of industrial technology upon visual communication and the study of the growth and development of modern graphic design.

ART 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.

ART 3663 (D,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. Same course as AMST 3673.

ART 3673 History of Northern Renaissance Art. Art in Northern Europe, c. 1200-1550. Emphasis on panel painting in the Netherlands (e.g. Van Eyck, Bosch), and book illustration in Germany (Durer).


ART 3693 (H) Survey of Asian Art. Arts of India, China, Japan and related countries in their historical and cultural settings. Traditions of painting, sculpture and architecture from their beginnings to the modern period. Same course as AMST 2693.

ART 3713 (H) Early Medieval Art: Saints, Martyrs, Pagans. Examination of the visual culture (sculpture, manuscripts, architecture, etc.) of the multicultural early Middle Ages in Europe and the wider Mediterranean world, from roughly 400 to 1050; includes Early Christian, Islamic, Byzantine, Germanic, Carolingian, Ottonian, and Anglo-Saxon artistic production.

ART 3723 (H) Court and Cloister: Medieval Art 1050-1400. Examination of the visual culture (sculpture, manuscripts, architecture, etc.) of the later Middle Ages in Europe and the wider Mediterranean world, from roughly 1050 through 1400; includes Islamic, Byzantine, Romanesque, and Gothic artistic production.

ART 3733 (H) Survey of Latin American Art. An overview of Latin American visual culture from the Precolumbian period to the present. We consider Maya, Aztec, and Inca cultures, the colonial arts of Spain, America, the South American avante garde, Mexican muralism and surrealism, and contemporary video, performance and installation.

ART 3743 (H) History of Latin American Art II. Exploration of modern Latin American Art, beginning with academic painting and emerging nationalisms in the nineteenth century and continuing through Mexican Muralism, modern art movements in South America, and contemporary painting, film, video, performance, and installation.

ART 3753 (H) The Arts of Spain and the Spanish World. The art and culture of Spain and the Spanish world, including Paleolithic art, Renaissance and Baroque works from the Iberian Peninsula and American viceregalities, and ending with Picasso and Miró.

ART 4053 Alternative Photography. Prerequisite(s): ART 3393, Photography II. This photography course provides an introduction to traditional photographic processes such as silver gelatin, salt prints, cyanotype, Van Dyke, and gum bichromate. Students will learn a variety of analog photographic processes as avenues to explore current questions in the medium. Through a series of assigned readings and regular critiques, students will consider their projects from a contemporary art perspective.

ART 4100 Advanced Drawing. 3 credits, max 9. Lab 6. Prerequisite(s): 3110. Investigation of drawing stressing thematic development, abstract ideas, and individual imagery.

ART 4110 BA Studio Capstone. Prerequisite(s): 2002 and senior standing or consent of instructor. The course provides guided assistance to BA Studio Art students in developing a professional portfolio as it relates to their career interests in the arts.

ART 4211 BFA Studio Capstone Exhibition. Prerequisite(s): Must have passed the BFA Studio Capstone Exhibition Review; must have consent of instructor. Provides individual guidance and instruction necessary for mounting
the BFA Studio Capstone Exhibition. This exhibition is the culminating event of the studio major's studies and a final preparation for a career in the studio arts. Enrollment must occur during the semester in which the BFA Studio Capstone Exhibition is to be mounted.

ART 4213 BFA Studio Capstone. Prerequisite(s): Concurrent enrollment in upper-division studio art course and consent of instructor. The purpose of this course is to provide students with the knowledge they need to make a career in art. Using the art they are preparing for the BFA Studio Capstone Exhibition, students will develop presentation and marketing materials in line with the professional standards of the field. They will be taught how to find, recognize and pursue artistic opportunities.

ART 4220 Oil Painting Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3223. Oil painting with emphasis on continuing personal development of visual ideas and techniques.

ART 4230 Watercolor Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3233. Stresses continued growth of personal imagery with an emphasis on the development of a consistent body of work and professional portfolio.

ART 4240 Jewelry and Metals Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3243. Emphasis on further development of personal concepts and technical skills through assigned and individual oriented projects. Broad-based exploration of advanced metalworking processes with emphasis on individual students' direction and technical needs.

ART 4250 Ceramics Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3253. Intended for students who want to specialize in the ceramic field of art. Will include sophisticated techniques of clay, glaze and firing methods. Emphasis on creation of a unique, well researched, aesthetically concise, and technically successful body of work.

ART 4260 Sculpture Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3263. 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.

ART 4270 Printmaking Studio. 3 credits, max 9, Prerequisite(s): 3273 and proficiency review or consent of instructor. A broad-based course which allows students to pursue individual interests using a variety of printmaking materials and processes. Emphasis on further development of concepts, skills and techniques.

ART 4280 Photography Studio. 3 credits, max 6. Prerequisite(s): ART 3393. Photography: The development of a personal artistic expression using photography. Through a combination of assigned and self-directed projects, this advanced course focuses on the continued development of conceptual aptitude and technical skills. The emphasis is on developing a creative body of work and engaging current and theoretical trends in the medium.

ART 4420 Graphic Design Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3423, 3443 or consent of instructor. Design and production of projects suited to the professional portfolio. Discussion of practical issues including career options, resume and portfolio preparation, and interviewing techniques.

ART 4430 Illustration Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3403, 3443 or consent of instructor. Conceptual development and production of illustrations in series. Development of individual style and assembly of a professional and consistent portfolio.

ART 4450 Motion Design Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3443 or consent of instructor. Exploration of motion design as visual communication with an emphasis on conceptual design and production methods. Emphasis on conceptual development and application of design principles.

ART 4460 Interaction Design Studio. 3 credits, max 9, Lab 6. Prerequisite(s): 3453 or consent of instructor. Exploration of the visual and technical aspects of interaction with various electronic platforms to design effective graphical user interfaces. Emphasis on quantitative and qualitative research, process, and traditional graphic design methods for creating user-centered digital environments.

ART 4493 Portfolio Capstone. Lab 6. Prerequisite(s): Senior standing and consent of instructor. Final preparation of a professional portfolio, culminating in an extensive design project and the design, organization and production of an exhibition of work. Professional study on setting fees, writing contracts, working with an agent and other business practices.

ART 4583 (H) Rome: The Eternal City in Art and Film. The idea of Rome as seen through ancient and modern visual culture. Course begins with the Augustan propaganda machine and subsequently considers the most significant imperial image-makers to follow. A major portion of the course will be devoted to more recent and contemporary depictions of the city, including Michelangelo’s New Rome to Fellini’s Roma. No credit for students with credit in 5583.

ART 4593 (H) Art of Conversion: 16th Century Art in Mexico. Art and architecture of the sixteenth century, including mission architecture, early altar- screens, the effect of European imports on native art production, and the role of confrontations and public ceremonies on contact-period culture. No credit for students with credit in 5593.

ART 4603 History of Ancient Egyptian Art. Broad survey of ancient Egyptian art and architecture from pre-dynastic to the beginning of the Christian Era under Roman rule (4000 B.C.-320 A.D.) Discussion within the context of religious meaning and overall cultural development of ancient Egypt.

ART 4613 Art Since 1960. Art and art theory from 1960 to the present. Major trends of Minimalism, Pop Art, Photo Realism, Performance, and Conceptual Art. Theories and intellectual bases of each movement as well as major critical responses. No credit for students with credit in 5613.

ART 4623 History of Prints and Printmaking. A survey of graphic art in Europe and the United States (c. 1450-1950). Woodcut, intaglio and lithography by master makers (e.g. Dürer, Rembrandt, Goya, Picasso). Print as a document of social history in the West.

ART 4653 History of Indian Art. The history and culture of South Asia (India and Pakistan) are explored through its arts—architecture, sculpture, painting, and design.

ART 4663 (H) History of Chinese Art. The arts of China in their historical, cultural, religious, and social context. Painting, sculpture, architecture, landscape, and decorative arts. No credit for students with credit in 5663.

ART 4673 History of Japanese Art. Critical social, religious, and historical issues in the arts of Japan. Painting, sculpture, architecture, landscape, and decorative arts. No credit for students with credit in 5673.

ART 4683 Modern and Contemporary Art in Asia. Modern and contemporary art in Asia. Special attention to the role of race, gender, and social class on artistic production.

ART 4693 Gender and Visual Culture. Explores themes and issues surrounding gender in relation to art history and visual culture more broadly. Topics may include artists and creators, sexuality, the body, eroticism, historicizing gender, feminism and feminist theory, etc. No credit for students with credit in 5693.

ART 4703 Art East and West: Biases and Borrowings. Explores the complicated interaction, cultural borrowings and responses on many levels of two major world systems, the "West" (Europe and America) and the "East" (South and East Asia). Beginning with the development of the sea trade in the 16th century, the course will study, through works of art, the effect of history, politics, religious struggles, economics, trade and ethnic biases on the cultures of East and West. No credit for students with credit in 5703.

ART 4713 (H, I) The Visual Culture of the Islamic World. Examines the visual culture, including art and architecture, of the Islamic world, dating from the invasion of Islam in seventh-century Arabia through today. No credit for students with credit in 5713.

ART 4723 History of Museums and Collecting. Investigation of the history of museums and collecting practices in Western Europe and the United States from the sixteenth century to the mid-20th century. Same course as ART 5723.

ART 4733* Museum Education. Prerequisite(s): ART 1513 or ART 2643 or by permission of instructor. Introduction to the major topics in museum education, including how object based learning is used with individuals and groups. Addresses the major pedagogical issues surrounding the use of art and other objects in museums.

ART 4763 Native American Art and Material Culture. Survey of the history and material production of the Native American tribes living within the boundaries of the continental United States and Canada. Focus on basic concepts and primary issues related to tribes of the major geographical areas: the woodland areas, which includes the Northeast and Great Lakes area, the Southwest, the Great Plains, the Southwest, the Plateau and West Coast, and the Northwest Coast. No credit for students with credit in 5763.

ART 4783 Rembrandt van Rijn. The Dutch artist Rembrandt van Rijn (1606-1669) was one of the most important and innovative painters and printmakers of the seventeenth century. This course is to acquaint students with both his extensive body of work and the central critical issues that interest scholars today. Same course as ART 5783.

ART 4793 Architecture and Space in East Asia. History of Architecture in East Asia from the traditional Chinese timber frame to the 20th century. Will address how architecture delivers political ideologies and structures social relationships, both symbolically and in practice.

ART 4800 Special Studies in Art. 1-3 credits, max 9. Prerequisite(s): Junior standing and consent of instructor. Courses in media exploration, special subjects and current issues. Offered on campus or through extension workshops.

ART 4810 Museum Internship. 1-3 credits, max 9. An on-site museum experience, including exhibition selection and preparation, collection cataloging and research, and museum administration.

ART 4813 Museum Exhibition. Designing an exhibition that draws on the Oklahoma State University art collection. Includes museum history, theory and curatorial practice. Same course as ART 5813.

ART 4820 Graphic Design Internship. 1-6 credits, max 6. Prerequisite(s): 3403 or 3423 and consent of instructor. An on-site graphic design work experience that provides professional practice under the supervision of a design professional.

ART 4830 Apprenticeship. 1-6 credits, max 6. Professional opportunity to work with artists of national and international reputation.

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ART 4900* Directed Study in Art. 1-3 credits, max 9, Lab 1-6. Prerequisite(s): Junior standing and written permission of department head. Self-designed special topics in studio art or graphic design. By contract only.

ART 4910* Directed Study in Art History. 1-3 credits, max 9, Lab 1-6. Prerequisite(s): Junior standing and written consent of department head. Self-designed special topics in art history. By contract only.

ART 4920* Art History Symposium. 1 credit. Prerequisite(s): One hour of ART 3600 and 4573. Specifically for art history majors, and typically taken during the student’s final year. Students prepare for, and participate in, a public presentation of a research paper (ART 3600). Special attention is given to a speaker’s argument, methodology, visual, and overall presentation.

ART 4933* Art in Context. Prerequisite(s): One hour of ART 3600. Designed specifically for art history majors, and typically taken during the junior year, this course examines select critical theories and their methodological application.

ART 4973* 20th Century Chinese Art. This course will explore the ways in which Chinese artists of the 20th century have defined China’s history and culture.

ART 4993 Senior Honors Project. Lab 3. Prerequisite(s): 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.

ART 5000* Art History Master’s Thesis. 1-3 credits, max 6. Independent study course intended to provide guidance for research and writing of MA Thesis in art history.

ART 5013* Theory and Methods in Art History. This course examines the field of art history in terms of its historiography, research methods, critical frameworks and theoretical underpinnings. Students are expected to develop and articulate their own theoretical and methodological position in the context of art and with explicit relation to contemporary praxis and theory.

ART 5400* Graduate Study: Graphic Design Thesis. Independent inquiry based on an original idea associated with a student’s chosen area of concentration under the direction and supervision of a major professor and graduate thesis committee. Thesis requires the definition of a graphic design problem, research of case studies and visual works relevant to the thesis topic, and the creation of an outline for the thesis.

ART 5410* Graduate Graphic Design Internship. On-site, graphic design work experience that provides graduate level students with professional practice under the supervision of a design professional.

ART 5413* Graduate Teaching Practicum in Graphic Design. This course is intended to provide graduate graphic design students seeking a career in higher education with university-level teaching methods and professional practices of curriculum development, syllabus writing, clarity of thinking, and various components of professional papers and presentations.

ART 5420* Graduate Graphic Design Studio. Introduction to the advanced conceptual techniques of graphic design as visual communication. Graduate students are introduced to the critical thinking necessary and technical skills for executing creative graphics work intended to be experienced via print media, with an emphasis on typography, composition and design principles.

ART 5423* Graduate Study in Graphic Design History. This course builds on foundational knowledge of graphic design history. Emphasis is placed on in-depth review and analysis of ground breaking design movements and perspectives, from modernism to contemporary era. Lectures, readings, research and other course activities will bring forth critical understanding of the relationship of history, design and culture as interconnected thread throughout time.

ART 5440* Graduate Special Topics in Graphic Design. 3 credits, max 6. Application of graphic design processes utilizing hybrid media and forms to address research topics. Emphasis on creative approaches to concept-driven design projects and development of a theoretical framework appropriate for graduate level work.

ART 5450* Graduate Motion Design Studio. 3 credits, max 9. Exploration of motion design as visual communication. Development of technical skills and critical thinking necessary for executing creative motion graphics portfolio work intended to be experienced via electronic media, with an emphasis on conceptual development and application of design principles.

ART 5460* Graduate Interaction Design Studio. 3 credits, max 9. Exploration of the visual and technical aspects of interaction with various electronic platforms to design effective graphical user interfaces. Emphasis on quantitative and qualitative research, process and traditional graphic design methodologies for creating centered digital environments.

ART 5470* Graduate Study in Graphic Design. 3 credits, max 9. Intensive graduate course of study in the fundamentals of graphic design. The course emphasizes research and analysis and the design processes that lead to creative conceptualization and final design solutions. Students are expected to demonstrate sophisticated design decisions and appropriate design solutions that demonstrate a high level of expertise and achievement to be experienced via print media.

ART 5480* Graduate Study in Motion Design. 3 credits, max 9. Graduate level course in motion design (also referred to as motion graphics). This course provides students with the opportunity to conduct research, develop advanced technical skills and apply critical thinking to graphic design using time-based media. Students will explore the role motion design plays in shaping meaning and contributing to visual culture.

ART 5490* Graduate Study in Interaction Design. 3 credits, max 9. Interaction Design, as it relates to the field of Graphic Design, is the exploration of a dialogue between a person and a product, system, or service. This dialogue is both physical and emotional, and is found in the interplay between form, function, and technology as experienced over time. Students will explore the role of graphic design while conducting sound research in a variety of disciplines such as psychology, communication theory, and sensory integration.

ART 5583* Rome: The Eternal City in Art and Film. The idea of Rome as seen through ancient and modern visual culture. Course begins with the Augustan propaganda machine and subsequently considers the most significant imperial image-makers to follow. A major portion of the course will be devoted to more recent and modern projections of the city, from Mussolini’s New Rome to Fellini’s Roma. No credit for students with credit in 4583.

ART 5593* Art of Conversion: 16th Century Art in Mexico. Art and architecture of the sixteenth century, including mission architecture, early altar screens, the effect of European imports on native art production, and the role of confraternities and public ceremonies on contact-period culture. No credit for students with credit in 4593.

ART 5613* Art Since 1960. Prerequisite(s): Permission of instructor. Art and art theory from 1960 to present. Major trends of Minimalism, Pop Art, Photorealism, Performance, and Conceptual Art. Theories and intellectual bases of each movement as well as major critical responses. No credit for students with credit in 4613.

ART 5663* History of Chinese Art. Critical social, religious, and historical issues in the arts of China. Painting, sculpture, architecture, porcelain, furniture, and decorative arts. No credit for students with credit in 4663.

ART 5673* History of Japanese Art. Critical social, religious, and historical issues in the arts of Japan. Painting, sculpture, architecture, landscape architecture, prints, and decorative arts. No credit for students with credit in 4673.

ART 5693* Gender and Visual Culture. Explores themes and issues surrounding gender in relation to art history and visual culture more broadly. Topics may include artists and creators, sexuality, the body, androgyny, historically gender, feminism and feminist theory, etc. No credit for students with credit in 4693.

ART 5703* Art East and West: Biases and Borrowings. Prerequisite(s): Instructor permission. Explores the complicated interaction, cultural borrowings and responses on many levels of two major world systems, the “West” (Europe and America) and the “East” (South and East Asia). Beginning with the development of the sea trade in the 16th century, the course will study, through works of art, the effect of history, politics, religious struggles, economics, trade and cultural biases on the cultures of East and West. No credit for students with credit in 4703.

ART 5713* The Visual Culture of the Islamic World. Examines the visual culture, including art and architecture, of the Islamic world, dating from the inception of Islam in seventh-century Arabia through today. No credit for students with credit in 4713.

ART 5723* History of Museums and Collecting. Prerequisite(s): Graduate standing. Investigation of the history of museums and collecting practices in Western Europe and the United States from the sixteenth century to the mid-20th century. Same course as ART 4723.

ART 5763* Native American Art and Material Culture. Prerequisite(s): Permission of instructor. Survey of the history and material production of the Native American tribes living within the boundaries of the continental United States and Canada. Focus on basic concepts and primary issues related to tribes of the major geographical areas: the woodland areas, which includes the Northeast and Great Lakes area, the Southwest, the Great Plains, the Southwest, the Plateau and West Coast, and the Northwest Coast. No credit for students with credit in 4763.

ART 5783* Rembrandt van Rijn. Prerequisite(s): Graduate standing or permission of instructor. The Dutch artist Rembrandt van Rijn (1606-1669), who was one of the most important and innovative painters and printmakers of the seventeenth century. This course will acquaint students with both his extensive body of work and the central critical issues that interest scholars today. Same course as ART 4783.

ART 5810* Museum Studies Internship. Prerequisite(s): Graduate standing. On-site museum experience, including exhibition selection and preparation, collection cataloging and research, museum education, and museum administration.

ART 5813* Museum Exhibition. Prerequisite(s): Graduate standing or permission of instructor. Designing an exhibition that draws on the Oklahoma State University art collection. Includes museum history, theory and curatorial practice. Same course as ART 4813.

ART 5900* Graduate Studies in Art. 1-6 credits, max 12. Prerequisite(s): BA, BFA or 15 upper-division hours in a discipline; consent of instructor. Projects in art with emphasis on portfolio preparation.
ART 5910* Graduate Studies in Art History. 1-6 credits, max. 12. Prerequisite(s): BA, BFA or 15 upper-division hours in art history; consent of instructor. Advanced research in art history.

ART 5920* Art History Graduate Seminar: Special Topics. 3-12 credits, max. 12. Special topics graduate seminar in art history.

Arts and Sciences (A&S)

A&S 1111 A&S First Year Seminar. Designed for incoming freshmen in the College of Arts & Sciences. Focuses on developing as a person, scholar, and professional through the exploration of majors and careers, personal strengths, goal setting, curriculum planning, academic success strategies, and ways of connecting to others and the university. Some sections are intended for particular majors or interests.

A&S 1221 Honors Freshman Orientation. Prerequisite(s): Honors Program participation. Orientation for freshmen in 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.

A&S 1222 Arts & Sciences Freshman Research Scholars. This seminar is for students who are participating in the Freshman Research Scholars Program. The tools needed for research and the approaches used to present the output of research will be discussed. The essential components of a research proposal will be reviewed, with examples of the approach needed for a successful proposal. Students will prepare their own research proposal in an area of interest to them. A practical component of the course focuses on preparing students for college success at Oklahoma State University.

A&S 2000 Special Topics. 1-3 credits, max 6. Selected interdisciplinary topics presented in lecture or seminar format.

A&S 2001 Introduction to European Studies. Overview of the history, languages, and cultures of the nations currently constituting the European Union.

A&S 3080 International Experience. 1-18 credits, max. 36. Prerequisite(s): Consent of the associate dean of the college. Participation in a formal or informal educational experience outside of the USA.

A&S 3090 Study Abroad. 1-18 credits, max. 36. Prerequisite(s): Consent of the Study Abroad office and associate dean of the college. Participation in an OSU reciprocal exchange program.

A&S 3111 New Student Seminar. Orientation to OSU for new transfer students. Topics include advanced study and writing skills, financial management, career development and the transition from college to work.

A&S 3710 Arts and Sciences Internship. 1-3 credits, max. 6. Prerequisite(s): Junior standing. Practicum or internship experiences not included in departmental offerings. Before enrolling, students must have an individual contract approved by the sponsoring Arts and Sciences professor and the dean of Arts and Sciences (or administrative officer). For use in special circumstances by Arts and Sciences departments that do not have an internship course.

A&S 4000 Special Topics. 1-3 credits, max. 6. Selected interdisciplinary topics presented in lecture or seminar format. Some sections may be pass/fail.

A&S 4013 Liberal Studies Senior Project. Prerequisite(s): Consent of instructor. Research report or other creative activity undertaken to satisfy capstone requirement for liberal studies degree.

A&S 4111 Job Search Strategies for Arts and Sciences Majors. Prerequisite(s): Junior standing. Identification of individual goals and transferrable skills, exploration of career options, job market research, and development of employment search tools.

Astronomy (ASTR)

ASTR 1013 (N) The Solar System. Recent discoveries about the sun, planets, moons, asteroids, meteoroids, and comets; formation and future of the solar system; interplanetary travel, colonization, terraforming, and the search for extraterrestrial life. Offered in the fall semester. No credit for those with credit in 1104.

ASTR 1024 (N) Stars, Galaxies and the Universe. Recent discoveries about the structure and life cycles of stars, galaxies and the universe; the search for extraterrestrial intelligence; interstellar travel, black holes, wormholes, and tachyons. Offered in the spring semester. No credit for those with credit in 1104.

ASTR 4010 Observatory Research. 1-2 credits, max. 8. Prerequisite(s): PHYS 2114 and consent of instructor; ASTR 1014 or ASTR 1024 recommended. Team execution of multi-semester observing programs with electronic detectors at OSU's off-campus observatory. Introduction to digital image processing and analysis.

Aviation Education (AVED)


AVED 1232 Private Flight Laboratory 2. Prerequisite(s): AVED 1222. Course contains second part of FAA Private Pilot Certification. Training conducted under 14 CFR 141.

AVED 1403 Advanced Theory of Flight. Prerequisite(s): 1114 and passed FAA Private Pilot Examination. Advanced navigation, aircraft performance and meteorology, and introduction to crew resource management.

AVED 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.

AVED 2122 Intermediate Flight Lab. Lab 4. Prerequisite(s): AVED 2133. Professional Pilot Course emphasizing IFR cross country operations. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 2133 Instrument Flight Laboratory. Prerequisite(s): AVED 2122 and AVED 1232. Professional Pilot Course required for FAA instrument rating. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 2142 Commercial Manuevers Flight Lab. Lab 4. Prerequisite(s): 2122. Professional Pilot Course emphasizing Commercial practical test maneuvers. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 2213 Theory of Instrument Flight. Prerequisite(s): 1403. Instrument flight rules, the air traffic system and procedures, the elements of forecasting weather trends. Preparation for FAA instrument computer-based knowledge exam.


AVED 2513 Aviation Career Planning and Development. Assessment of job interests and aviation job opportunities that match those interests. Development of an academic and career learning and development plan consistent with identified interests.


AVED 3243 Human Factors in Aviation. The study of people interacting with the aviation environment. Individual and group performance, equipment design, physical environment and procedure development.

AVED 3333 Advanced Aircraft Systems. Prerequisite(s): 2331. Study of complex aircraft systems. Electronic flight instruments, inertial navigation, and aircraft monitoring systems.

AVED 3341 Multi-Engine Flight Laboratory. Lab 2. Prerequisite(s): 2142. Professional Pilot Course emphasizing multiengine operations, including Commercial certification with Multiengine Rating. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 3433 Aviation/Aerospace Ethics. Ethical decision-making as applied to aviation and aerospace industry, an industry with narrow tolerance for error in terms of human life and economic impact. Awareness of aviation ethical issues and associated decision-making skills.

AVED 3443 Aviation Legal and Regulatory Issues. 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.


AVED 3463 Aerospace Maintenance and Safety. Identification and management of the human errors encountered in all aspects of aircraft maintenance operations. Case studies of maintenance-related accidents: line, hangar, and overhaul maintenance. The role of quality control and quality assurance are also examined as tools in reducing maintenance error.

AVED 4737 OSHA for Aerospace Managers. Occupational safety and health requirements within the aerospace industry. History of OSHA, OSHA regulations relative to aerospace organizations along with recent inspection results and published violations.

AVED 4843 Airport Passenger and Baggage Screening. The history of airport security, the laws and agencies tasked with aviation security and the passenger and baggage screening technologies currently in use or being tested in airports. The role of technology in the aviation layered security program will be discussed.

AVED 4893 Analysis of Aviation Security Countermeasures. A comprehensive approach to identification and analysis of security countermeasures in the Aviation industry.

AVED 3513 Aviation/Aerospace Management Principles. Managing the major elements of the aviation/aerospace industry, including aircraft
manufacturing and air transportation system.

AVED 3523 Airport Planning and Management. Overview of the major functions of airport management, including master planning. Study of the socioeconomic effects of airports on the communities they serve.

AVED 3533 Aircraft Turbine Engine Operation. Principles of physics and gas laws pertaining to turbine powered aircraft operation. Turbine power plant systems theory with emphasis on safe and efficient operation of turbine powered aircraft.

AVED 3543 Aerospace Organizational Communications. Aerospace communication to aid aviation students in proper use of written and verbal skills needed in various aerospace leadership roles.

AVED 3563 Aviation Marketing. Marketing aviation products for the major elements of the aviation industry.

AVED 3573 Aviation/Aerospace Finance. Financing the major elements of the aerospace industry, including general aviation, aircraft manufacturing and airports.

AVED 3623 Airport Network Security. Comprehensive evaluation of the airport network landscape to include evaluation and mitigation of potential threats to the overall airport environment.

AVED 3663 Aerospace and Air Carrier Industry. 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, regulators and associations, economic characteristics, labor relations and marketing of modern air carriers.

AVED 3883 Space Flight. A broad understanding and an in-depth knowledge of space flight and exploration of outer space. Emphasis will be placed on a thorough historical review and examination of the types of people and technological advancements involved in space exploration and flight.

AVED 4100* Specialized Studies in Aviation. 1-3 credits, max 6. Independent studies, seminars, and training within selected areas of aviation.

AVED 4103 Aerospace Distribution, Warehousing and Transportation. Aerospace logistics concepts and the management of aerospace distribution activities ranging from top management planning to warehousing and shipping.

AVED 4113* Aviation Safety. Flight safety including studies in human factors, weather, aircraft crashworthiness, accident investigation, and aviation safety programs. Elements of aviation safety and flight operations (private flying, flight instruction, and business flying) and commercial aviation.

AVED 4123 Aerospace Depot Maintenance. Aerospace depot maintenance operational and budget issues related to Economic Order Quality, Materials Requirement Planning, Benefit Cost Analysis, repair expenditures, fleet flight hours, transport modules, handling, shipping and other activities.

AVED 4133 Principles of Flight Instruction. Preparation for the FAA Fundamentals of Instruction and Flight Instructor Knowledge Exams, as well as preparation for the CFI Initial Practical Test.


AVED 4153 Aerospace Sustainment. Prerequisite(s): Senior standing. A capstone course requiring application of all elements of the supply-chain management process to an aerospace organizational problem or project.

AVED 4163 FAA and Aerospace Logistics Regulations and Requirements. Government regulations and requirements and the impact of those requirements on the aerospace supply chain management processes using case scenarios related to logistics, aviation, operations, procurement and the environment.

AVED 4173 Aerospace Logistics Quality Programs. Logistics quality programs, including TQM, Kaizen, Lean, Six Sigma, and ISO 9000 in aerospace organizations.

AVED 4193 Aerospace Human Resource Management and Aerospace Workforce Acquisition. Workforce planning techniques to strengthen knowledge retention areas within the aerospace industry.

AVED 4200 Internship in Aviation. 1-12 credits, max 12. Individually supervised internship in aviation career areas. Directed field experience related to the participant’s area of concentration.

AVED 4223 Turbine Aircraft Transition. Prerequisites: AVED 3341, AVED 3333, AVED 4353*, and AVED 4703. Fundamental flight and operating procedures of turbofan powered aircraft.

AVED 4232 Flight Instructor: Airplane Flight Laboratory. Lab 4. Prerequisite(s): 2142, 4133. Dual flight instruction to meet the requirements for the FAA flight instructor: airplane certificate. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 4303* Aviation Weather. Prerequisite(s): GEOG 3033. Familiarization with weather products needed to enhance flight safety.

AVED 4311 Flight Instructor: Instrument Flight Laboratory. Lab 2. Prerequisite(s): 4231. Dual flight instruction to meet the requirements of adding an instrument flight instructor rating to the flight instructor certificate. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 4333* Advanced Aircraft Performance. A study of advanced aircraft performance including appropriate physical laws, atmospheric properties and power plant technology.

AVED 4343* Geospatial Technologies for Aerospace Managers. Using geographic information systems (GIS) and other geospatial technologies to effectively manage airports, including project management, maintenance, safety, and security, noise and obstruction management, and environmental management.

AVED 4353* Cockpit Automation. Prerequisite(s): AVED 2133. A study of airplane “glass cockpits”, including performance management, navigation and guidance, automatic flight control, flight instrument displays, and crew advisory and warning.

AVED 4413* Aviation Terrorism and Asymmetrical Warfare. Origins of modern terrorism and asymmetrical warfare as it related to current aviation security issues. A historical perspective to the headlines of today providing an understanding needed in making future security decisions.

AVED 4423* Aviation Security Organizations and Law. Understanding how security systems and law are organized and managed. Problems facing security management, including recruiting, screening, and hiring of security personnel. Problems associated with 24/7 operations.

AVED 4433 Airport Safety Inspections. Safety requirements of U.S. general aviation airports. Elements of the 5010 airport inspection program, FAA advisory circulars, and other pertinent documents.

AVED 4523 Airport Certified Member Preparation. Prerequisite(s): 3523. Course focus is to earn knowledge necessary to successfully complete the AAAE Certified Member (CM) designation examination. Comprehensive evaluation of airport management and leadership issues to include airport operation, air service development, construction, finance, legislative affairs, maintenance, marketing and communications, operations, planning, and security.


AVED 4653 (I) International Aerospace Issues. Fundamental knowledge, comprehension and abilities to apply, analyze, synthesize and evaluate international aerospace issues, including trends in security, safety, technology, and organizations.

AVED 4663 Aerospace Leadership. Leadership theories and practices applicable to the aerospace environment and the types of leadership skills required for 21st Century aerospace organizational leaders.

AVED 4703 Crew Resource Management. Prerequisite(s): 2142, 3243. Discovering how resource management applies to crew behavior in aviation. Special emphasis on decision-making, judgment, teamwork, stress management, situation awareness, leadership, and workload management. Ten hours in a dual flight control multi-engine simulator. Special fee required.

AVED 4713 Unmanned Aircraft Pilot Laboratory. Prerequisite(s): AVED 1114 Theory of Flight. Aeronautical theory, information and piloting skills will be utilized for operating an unmanned aircraft safely, efficiently and within its specified limitations. Classroom and laboratory experiences are designed for the student to gain the necessary skills to operate an unmanned aircraft safely.

AVED 4771 Flight Instructor: Multi-Engine Flight Laboratory. Lab 2. Prerequisite(s): AVED 4232. Dual flight instruction to meet the requirement for adding a multi-engine flight instructor rating to the flight instructor certificate. Flight instruction conducted under FAR Part 141. Special fee required.

AVED 4813 Air Transportation Compliance. Regulatory requirements in the management of air transportation and logistics operations including the shipment of hazardous materials in domestic and international transport, US Customs import/export compliance, and Transportation Safety Administration (TSA) requirements.

AVED 4883 Capstone Course in Aviation Management. Prerequisite(s): Aviation Management major with senior status. Applies knowledge and issues obtained in prior aviation courses.

AVED 4943* Basic Aircraft Accident Investigation. A study of statutes, regulations and regulatory agency requirements that influence aircraft accident investigation.

AVED 4953* Corporate and General Aviation Management. Study of management principles and practices of corporate and general aviation. Equipment acquisition, legal requirements, government regulations, flight operations, aircraft maintenance, management and investment decision-making.

AVED 4963* Airport Design. Overview of airport planning and development parameters, airport design considerations, economic impact of airport development, and a global examination of airport expansion projects.

AVED 4983 Aerospace Industry Hazardous Materials or Dangerous Goods. Regulatory requirements and compliance issues in managing aerospace industry hazardous materials and dangerous goods.

AVED 4990 Pilot Proficiency Flight. 1-2 credits, max 4, Lab 32. Required for students entering the aviation education program who possess all FAA certificates/ratings required for the aviation sciences degree.

AVED 4993 Aviation Labor Relations. Aviation industry laws, regulations, and
procedures for management and organized labor from historical through current perspectives. Focus on economic, legal, political, and public policy factors in aviation.

AVED 5000* Master's Report or Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of adviser. Students studying for a master’s degree enroll in this course for a total of 3 credit hours if writing a report or 6 hours if writing a thesis.

AVED 5020* Seminar in Aerospace Education. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Individual research problems in aerospace education.

AVED 5053* Guided Reading and Research. Prerequisite(s): Consent of instructor. Guidance in reading and research required for the MS in aviation and space program.

AVED 5103* Aviation Career Development. Aviation career development in private and public aviation organizations.

AVED 5113* Aviation Safety Program Development. Prerequisite(s): 4113. A detailed examination of risk management and accident prevention in the aviation industry. Organization and operation of safety programs including OSHA requirements, performance measurements, cost analysis, and systems safety analysis.

AVED 5153* Capstone in Aerospace Research. Prerequisite(s): 5553. The final culminating project intended to be an in-depth application of the knowledge and skills acquired from the MS Aerospace Education curriculum.

AVED 5200* Graduate Internship in Aviation and Space. 1-6 credits, max 6. Directed field experiences in aerospace education for master’s students.

AVED 5203* Aeromedical Factors. Prerequisite(s): 3243. The study of aeromedical factors that influence pilot performance. The study of life support equipment designed to increase aviation safety.


AVED 5333* Aircraft Performance. Operational flight performance issues, especially transition from propeller-driven to jet aircraft. Use of flight simulation software to determine optimal speeds for climb, descent, range and maximum endurance of a specific aircraft model.

AVED 5363* Aircraft Systems. Flight management systems, data exchange busses, computerized flight control systems, airframe environmental systems, electrical, pressurization, fuel and icing. Earlier generation aircraft systems contrasted with modern aircraft systems.

AVED 5403* Passenger Screening Technology. Understanding of the technologies currently in use or being tested in airports. Passenger screening technologies and their role in establishing a layered security program.


AVED 5423* Security Planning Audits and NIMS. The management of a security program. Written security plans, security audits, emergency management, and the National Incident Management System.

AVED 5433* General Aviation and Cargo Security. Overview of airport operations: regulatory history of air transportation, aviation forecasting, capacity and delay issues at airports, environmental issues, airport emergency procedures and aircraft rescue and fire-fighting, and airport system and master planning.

AVED 5443* International Aviation Security. Civil aviation security structure required of all airports and airlines engaged in international civil aviation operations. Focuses on the requirements of the International Civil Aviation Organization, specifically ICAO Annex 17.

AVED 5453* Advanced Aviation Security. Prerequisite(s): Graduate standing. In-depth look at aviation security. Development of a greater understanding of problems associated with maintaining a secure aviation transportation industry. Familiarity with the history of attacks against aircraft, airports and other aviation facilities.

AVED 5463* Aerospace Risk Assessment. The risks, threats, and vulnerabilities associated with aviation/aerospace assets, and associated decision-making processes. Risk management principles and utilizing cost-benefit analysis and other tools and methodologies applicable to aviation and aerospace challenges.

AVED 5473* Aerospace Education and Training Effectiveness. Curriculum design and instructional effectiveness for aviation/aerospace educators and training professionals.

AVED 5543* Advanced Aerospace Communications. Interdisciplinary area of study drawing from previous knowledge and experience in effective management and leadership communication to meet the unique demands of the field of aviation. A broad range of academic disciplines and technical experience guiding aviation professionals in the refinement of personal, team and organizational communications.

AVED 5553* Aerospace Proposal and Procurement. Analysis of aerospace proposal writing and federal grant development including the basics of government acquisition and procurement.

AVED 5563 Aerospace Leadership and Management. Introductory course on leadership and management issues in the highly volatile aerospace environment. Introduction to management and leadership theory of the past, and exploration of the aviation environment of the future.

AVED 5573* Aerospace Defense Acquisition. Analysis of the Department of Defense (DoD) acquisition process, including the basics of acquisition management and the life cycle of a defense contract from inception to disposal. Phases of acquisition include: concept exploration, development, production, fielding and deployment.

AVED 5593* Influencing Public Policy in the Aerospace Industry. The aerospace legislative process, researching draft legislation, tracking state and federal legislation, communicating with legislators identifying the fiscal impact and benefits.

AVED 5663* Issues in the Airline/Aerospace Industry. The components, participants, activities, characteristics, scope and economic significance of the air carrier industry and its major segments. The effects of regulation, competition, marketing, manufacturing and environmental control.

AVED 5720* Current Issues in Aerospace Education. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Current issues in aerospace education.

AVED 5773* Historical Significance of Aviation. Humankind’s attempt to conquer the skies from the earliest accomplishments in aviation to the aircraft of tomorrow. Profiles the way people, technology, and events have shaped the modern world of aviation.

AVED 5813* Earth Observation Systems. Prerequisite(s): GEOG 4333. A study of systems orbiting earth that collect data on the land and atmosphere.

AVED 5823* Space Science. A study of the sun, inner and outer planets, asteroid belt, space probe exploration, orbital mechanics and missions.

AVED 5850* Directed Readings in Aerospace Education. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Directed studies in aerospace education.

AVED 5883* Aviation Economics. The economic significance of the air carrier industry and its major segments. The effects of regulation, competition, schedules, marketing and environmental control.


AVED 5910* Practicum in Aerospace Education. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Directed observation and supervised clinical experiences in aerospace education.

AVED 5953* Labor Relations in Aviation and Aerospace. Labor laws, regulations, and labor-management relations in the U.S. aviation and aerospace industry, underlying the air carriers, public airport infrastructure, and related government employers.

AVED 5963* Airport Operations. Prerequisite(s): Graduate standing. Extensive overview of airport operations. Familiarity with the regulatory history of air transportation, airports, the Federal Aviation Administration, and the Transportation Security Agency. Introduction to a wide variety of organizational structures found at U.S. airports.

AVED 5973* Aerospace Law. Study of the legal system as it relates to aerospace law and governance of the aviation industry.

AVED 5993* Ethics in Aviation. Learning how to protect vital interests and maintain ethical control in highly regulated environments.

AVED 6103* Doctoral Seminar in Aerospace Education. Individual research problems in aerospace education.


AVED 6203* Aviation Physiology. Prerequisite(s): 5503 or equivalent. The study of the complexities of pilot performance as it relates to human physiology, human factors and aviation safety.

AVED 6303* Aviation and Space Safety Data Analysis. A doctoral seminar in the development and research of aerospace databases. Qualitative and mixed method tools common to research in the fields of aviation and aerospace are emphasized.

AVED 6313* Administration of Aviation Institutions. A study of the organization and administration of public and private aviation institutions. Study of the impact of economic and governmental system on these institutions.

AVED 6413* Development of Air and Space Flight. Specific air and space missions with emphasis on contributions to humankind.

AVED 6423* Certification of Airplanes. A study of the practices and research involved in the certification of airplanes.

AVED 6443* Certification of Rotorcraft. A study of the practices and research involved in the certification of rotorcraft.

AVED 6613* Aviation Executive Development. A study of the styles of aviation executives in private and public aviation organizations.

AVED 6773* Applied Aviation and Space Research. Prerequisite(s): Consent of instructor and approval of student's advisory committee. Action research...
**Biochemistry (BIOC)**

**BIOC 1990 Freshman Research in Biochemistry.** 1-2 credits, max 2. An introduction to biochemical research through guided work on a relevant experimental problem.

**BIOC 2101 The Experiments Behind the Facts of Real Science.** Prerequisite(s): BIOL 1114 and CHEM 1515. Introduction to research through the study of primary research papers.

**BIOC 2202 Medicine and Molecules.** Examination of specific diseases at all scales, from the biology of the causal agent to global impacts. The molecular biology of the agent, interactions with the human body, and the etiology, epidemiology, history and current state of the disease, ethical considerations, and treatment and current issues.

**BIOC 2344 Chemistry and Applications of Biomolecules.** Prerequisite(s): CHEM 1225 or CHEM 1515. 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 pre-professional students or students planning graduate study in biological sciences.

**BIOC 3003 Hypothesis-Driven Undergraduate Research.** Prerequisite(s): Consent of instructor. Directed research projects with faculty members in biochemistry and molecular biology. Identify a research question, develop a hypothesis, experimental approach, perform the experiments, and summarize their results in oral and written forms.

**BIOC 3224* Physical Chemistry for Biologists.** Prerequisite(s): CHEM 1515, MATH 2144, PHYS 1114 or PHYS 2104 or consent of instructor. Classical and statistical thermodynamics, applications to pure systems, solutions and electrochemistry; transport; chemical and enzyme kinetics, quantum chemistry of structure and chemical bond; and spectroscopy all with emphasis on biological applications.

**BIOC 3653 Survey of Biochemistry.** Prerequisite(s): CHEM 3015 or 3053. An introduction to the chemistry of living systems. Chemical properties of the constituents of living organisms. Modes of formation, reactions and function of these compounds in microorganisms, plants and animals. Intended for non-majors.

**BIOC 3713 Biochemistry I.** Prerequisite(s): CHEM 3053. Biochemistry of nucleic acids, proteins, amino acids, carbohydrates, and lipids with an emphasis on the kinetics, thermodynamics, catalytic and regulatory strategies of biochemical reactions and bioenergetics. Designed for biochemistry majors.

**BIOC 3723 Biochemistry and Molecular Biology Laboratory.** Prerequisite(s): BIOC 3653 or BIOC 3713 or concurrent enrollment. Integrated lecture-laboratory course on fundamental theories and techniques in biochemical, forensic, and clinical research. Hands-on experience in mass spectrometry, DNA analysis, metabolic assays, kinetic assays, and protein purification.

**BIOC 3813 Biochemistry II.** Prerequisite(s): 3713. Continuation of Biochemistry I with focus on metabolic pathways, cycles, and control mechanisms. This course will cover bioenergetics and metabolism of carbohydrates, lipids, amino acids and nucleotides. Designed for biochemistry majors.

**BIOC 4113* Molecular Biology.** Prerequisite(s): 3653 or 3713 and BIOL 3023 or ANSI 3423 or PLNT 3423. Applications of biochemistry, molecular biology and genetic engineering with emphasis on protein structure and function, regulation of cell function, metabolism and disease processes.

**BIOC 4523* Biochemistry of the Cell.** Prerequisite(s): 3653 or 3713 and ANSI 4323 or PLNT 3543 or consent of instructor. The biochemistry of fundamental processes in normal and disease states of eukaryotic cells. Primary literature based experimental approaches to the mechanisms of intracellular protein trafficking, cytoskeleton, cell adhesion, mitosis, cell cycle, cytokinesis, and apoptosis.

**BIOC 4883 Senior Seminar in Biochemistry.** Prerequisite(s): 3813 or consent of instructor. A senior capstone course for the development of scientific verbal and written communication and assessment of cumulative abilities. Focus is on problem solving, group discussion, primary literature review, oral presentation, and writing.

**BIOC 4990* Undergraduate Research.** 1-6 credits, max 10. Training in independent work, study of relevant literature and experimental investigation of an assigned problem.

**Biochemistry (BIOC) 5000* Research.** 1-6 credits, max 6. For MS thesis.

**Biochemistry (BIOC) 5002* Research Compliance and Biochemistry Graduate Colloquium.** Prerequisite(s): Graduate standing. Introduction to graduate research. Policies for laboratory safety, research compliance, and ethical conduct of scientific research are presented.

**Biochemistry (BIOC) 5102* Molecular Genetics.** Prerequisite(s): 3653 or MICR 3033 and one course in genetics or consent of instructor. An introduction to molecular genetics on the graduate level. (Same course as GEEN 5102)

**Biochemistry (BIOC) 5112* Prerequisite(s): BIOC 5753 or equivalent or permission of instructor. Techniques for effective communication of scientific reasoning, logic, and critical thinking. Explanation of rationale, hypotheses, and experimental design. Public presentations as logical arguments. The course focuses on biomedical molecular systems.

**Biochemistry (BIOC) 5753* Biochemical Principles.** Prerequisite(s): CHEM 3153 or equivalent. Chemistry of cellular constituents; introduction to the chemical processes in living systems. The first in a series of courses for graduate students in biochemistry and related fields.

**Biochemistry (BIOC) 5824* Biochemical Laboratory Methods.** Lab 6. Prerequisite(s): 4113 or 5753. Lecture and laboratory course in basic biochemistry and molecular biology methods for separation and analysis of biological materials, including chromatography, electrophoresis, centrifugation, use of radioisotopes, molecular cloning and DNA sequencing.

**Biochemistry (BIOC) 5853* Metabolism.** Prerequisite(s): 5753 or 4113. Reaction sequences and transformations in the enzymatic turnover of fats, proteins and carbohydrates; energy transfer, biosynthesis and integration in the metabolic pathways.

**Biochemistry (BIOC) 5930* Advanced Biochemical Techniques.** 1-4 credits, max 10. Prerequisite(s): 5753, 5824 or concurrent registration, and consent of instructor. Lecture and laboratory course in advanced research techniques, designed to implement 5824. In subsequent semesters, individual research problems pursued in laboratories of department faculty for six weeks and one credit hour each.

**Biochemistry (BIOC) 6000* Research.** 1-15 credits, max 60. For PhD dissertation.

**Biochemistry (BIOC) 6110* Seminar.** 1-2 credits, max 2 for PhD or 1 for MS candidates.

**Biochemistry (BIOC) 6723* Signal Transduction.** Prerequisite(s): BIOL 3023, BIOC 3653, 4113 or equivalent or consent of instructor. Classical signal transduction mechanisms including MAP kinase signaling cascades, Protein kinase A, Protein kinase C pathways, JAK/STAT pathways, calcium signaling, the cell cycle, programmed cell death, and cell signaling in cancer. Strong focus on the primary literature and experimental strategies used in modern cell biology.

**Biochemistry (BIOC) 6733* Functional Genomics.** Prerequisite(s): 3653 or 3713 and 3613 or 5753 or consent of instructor. Principles and techniques of genomic technologies and their applications in basic science and applied animal and plant research. Genome sequencing, variation detection, transcriptomics, proteomics, metabolomics, metagenomics, systems biology, forward and reverse genetics.

**Biochemistry (BIOC) 6740* Physical Biochemistry.** 1-2 credits, max Z. Prerequisite(s): One semester each of biochemistry, calculus and chemical thermodynamics. Two independent modules dealing with applications of physical chemistry and math to biological phenomena: 1) numerical analyses and selected spectroscopic methods, and 2) thermodynamics and transport properties. *Modules may be taken together as two credits or individually for one credit.*

**Biochemistry (BIOC) 6753* Epigenetics.** Prerequisite(s): 5102 or 5753 or consent of instructor. Principles underlying heritable changes in gene expression caused by mechanisms other than changes in the DNA sequence. The roles of chromatin structure, DNA and histone modification, and small RNAs in plant and animal development and disease. Applications of epigenetic-based therapeutics and the use of RNA interference in plants and animals.

**Biochemistry (BIOC) 6763* Nucleic Acids and Protein Synthesis.** Prerequisite(s): 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.

**Biochemistry (BIOC) 6773* Protein Structure and Enzyme Function.** Prerequisite(s): 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.

**Biochemistry (BIOC) 6783* Biomembranes and Bioenergetics.** Prerequisite(s): 5853 or consent of instructor. Components, organization and biosynthesis of plasma, mitochondrial 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.

**Biochemistry (BIOC) 6793* Plant Biochemistry.** Prerequisite(s): 4113 or 5753. Biochemistry of processes and structures of special importance to plants, such as photosynthesis, cell walls, nitrogen fixation, secondary metabolites and storage proteins.

**Biochemistry (BIOC) 6820* Selected Topics in Biochemistry.** 1-3 credits, max 15. Prerequisite(s): 5853. Recent developments in biochemistry. Subject matter varies from semester to semester; students should inquire at the department office before enrolling.
BIOL 1114 *(L,N) Introductory Biology. Lab 3. Introduction to the integration between structure and function among all levels of biological organization. Application of principles of evolution, genetics, physiology and ecology to understanding the integrated and interdependent nature of living systems through discussions emphasizing the process of science. Current issues and local research and observation in both lecture and lab. Recommended for non-science and science majors.

BIOL 1604 Animal Biology. Lab 2. Prerequisite(s): BIOL 1114. Morphology, physiology, ecology, life histories and importance of representatives of major groups to humans. Evolution of systems and mechanisms which have allowed animals to survive and adapt to diverse habitats. Previously offered as ZOOL 1604.

BIOL 3023 General Genetics. Prerequisite(s): BOT 1404 and BIOL 1604, or equivalent. Inheritance in plants, animals, and microorganisms; molecular and classical aspects.

BIOL 3034* General Ecology. Lab 4. Prerequisite(s): BIOL 1114 or equivalent and (BOT 1404 or BIOL 1604 or equivalent) and (MATH 1513 or MATH 1613 or MATH 1715 or MATH 2144). An overview of the study of organisms interacting with each other and their environment at individual, population, community, and ecosystem levels of organization. Includes human interaction with ecological systems.

BIOL 3053 (N) Freshwater: Concepts, Threats and Management. Freshwater is a critical, non-substitutable resource. Do we have enough? How are we going to manage it? This course will introduce non-biology majors to the concepts, threats, and policy relevant to freshwaters using information published in the popular science press. Issues directly relevant to Oklahoma, and the U.S. will be discussed. Debates modeled using the legal system of policy formulation will provide critical thinking and communication skills in an exciting real-world milieu. ZOOL and PHSL majors may count as elective hours only. Previously offered as ZOOL 3023.

BIOL 3104* Invertebrate Zoology. Lab 4. Prerequisite(s): BIOL 1604. Morphology, physiology, reproduction and ecology of major invertebrate groups. Previously offered as ZOOL 3104.

BIOL 3113 (N) Human Evolution. Prerequisite(s): BIOL 1114 or equivalent strongly recommended. Overview of how evolution shapes human biology. Topics include evolutionary mechanisms, human genetic variation and health, primate diversity, the fossil record, and the origins, dispersal, and behavior of anatomically modern humans. ZOOL and PHSL majors may count as elective hours only. Previously offered as ZOOL 3113.

BIOL 3114* Vertebrate Morphology. Lab 3. Prerequisite(s): BIOL 1604. Comparative morphology of representative vertebrates with emphasis on phylogeny and ontogeny and consideration of histology and function. Previously offered as ZOOL 3114.

BIOL 3123 (N) Human Heredity. The impact of genetics on human endeavor. No degree credit for students with prior credit in BIOL 3023. ZOOL and PHSL majors may count as elective hours only. Previously offered as ZOOL 3123.

BIOL 3153 Animal Behavior. Prerequisite(s): Junior standing. Survey of theory and application in basic and applied animal behavior. Interdisciplinary analysis of animal behavior in the field, captive settings and laboratories. Previously offered as ZOOL 3153.

BIOL 3163 Environmental Biology. Prerequisite(s): Introductory Biology and one course in General Chemistry. Overview of how organisms are influenced by the environment in which they live and how anthropogenic activities impact their environment. Topics include impacts of disturbing energy and material cycles, toxicological disease, and infectious disease. Previously offered as ZOOL 3163.

BIOL 3204 Physiology. Lab 2. Prerequisite(s): “C” or better in both BIOL 1114 and (CHEM 1215 or CHEM 1314). Anatomy and function of the human body. Previously offered as ZOOL 3204.

BIOL 3214 Human Anatomy. Lab 3. Prerequisite(s): “C” or better in either BIOL 1604 or BIOL 3204. Gross anatomy of the human body and its systems with a minor emphasis on histology. Laboratory based on human models and comparisons with dissections of nonhuman mammals. Previously offered as ZOOL 3214.

BIOL 3233 Human Reproduction. Prerequisite(s): BIOL 1114 or consent of instructor. Overview of human reproduction, including conception, pregnancy, childbirth, sexual maturation, and parental investment in offspring. Draws from multiple fields such as genetics, anatomy and physiology, developmental biology and evolutionary theory. Previously offered as ZOOL 3233.

BIOL 3513 Principles of Conservation Biology. Prerequisite(s): Junior Standing (and NREM 3012 and NREM 3013) or BIOL 3034. A scientific foundation of conservation biology through the study of the importance of conservation in society, the role of conservation policy, protected areas, and planning, and the study of conservation biology. Topics covered include Ecology, Evolution, and Genetics. Previously offered as ZOOL 3513.

BIOL 3604 Biological Principles for Teachers. Lab 2. Prerequisite(s): BIOL 1114 and BIOL 3204 and CHEM 1314. Capstone course in biology for potential science teachers. Review of biological phenomena and principles as related to the curriculum.

BIOL 3700 Readings and Special Studies in Integrative Biology. 1-3 credits, max 6. Prerequisite(s): BIOL 1604 and consent of instructor. Discussion of selected readings. Previously offered as ZOOL 3700.

BIOL 3933 Research Methods. Lab 2. Prerequisite(s): BIOL 1114 and (MATH 1613 or MATH 2144) and (STAT 2033 or STAT 4013). Students perform independent inquiries and learn to combine skills from mathematics and science to solve research problems. Students will design experiments, collect and analyze data, formulate hypotheses, justify conclusions, create mathematical models to read and evaluate the scientific literature, and write and present research reports. No credit for students with degree credit in MATH 3933.

BIOL 4104* General Parasitology. Lab 3. Prerequisite(s): BIOL 1604. Fundamentals of parasitism with emphasis on: life cycles, disease conditions, epidemiology, diagnosis, treatment, historical significance, terminology, taxonomy, and parasitological techniques. Previously offered as ZOOL 4104.

BIOL 4113 Conservation Genetics. Prerequisite(s): (BIOL 3023 or equivalent) and MATH 1513. Principles of population genetics as they pertain to issues in conservation biology. Evolutionary relationships, hybridization, natural selection, factors affecting small populations, gene flow, captive populations, and metapopulations. No credit for students with credit in BIOL 5113. Previously offered as ZOOL 4113.

BIOL 4133* Evolution. Prerequisite(s): BIOL 3023. Development of the evolutionary concept; speciation evolutionary mechanisms and phylogenetic concepts. Previously offered as ZOOL 4133.

BIOL 4134* Embryology. Lab 2. Prerequisite(s): BIOL 3114, MICR 3033. Biochemical basis of development with emphasis on gene regulation. Comparative development of sea urchin, frog, chick and pig. Experiments using frog and mouse, including the molecular level. Previously offered as ZOOL 4134.

BIOL 4174* Mammalogy. Prerequisite(s): “C” or better in BIOL 1604 and (BIOL 3034 or NREM 3013). Taxonomy, identification, evolution, zoogeography, life history traits, and techniques of study of wild mammals. Weekend field trips required. Previously offered as ZOOL 4174.

BIOL 4215* Mammalian Physiology. Prerequisite(s): “C” or better in both BIOL 3024 and (CHEM 3015 or CHEM 3053). Descriptive and functional analysis of the mammalian nervous, cardiovascular, musculoskeletal, respiratory, renal, endocrine, and digestive organ systems. For majors in human and animal sciences, particularly pre-medical, pre-dental, and pre-veterinary tracks. Previously offered as ZOOL 4215.

BIOL 4223* Mammalian Physiology Laboratory. Lab 4. Prerequisite(s): “C” or better in BIOL 4215. Laboratory experiments that illustrate functions of organs, organ systems or mechanisms of whole body physiological control. Previously offered as ZOOL 4223.

BIOL 4243* Introductory Pharmacology. Prerequisite(s): “C” or better in either BIOL 3204 or BIOL 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. Previously offered as ZOOL 4243.

BIOL 4273 Environmental Physiology. Prerequisite(s): BIOL 3204 or BIOL 4215. The study of animal adaptation and responses to natural environments. Topics include marine, shoreline, freshwater, and terrestrial habitats as well as anthropogenic problems specific to these habitats. No credit for students with credit in BIOL 5273. Previously offered as ZOOL 4273.

BIOL 4283 Endocrinology. Prerequisite(s): “C” or better in (BIOL 3204 or BIOL 4215) and credit in (CHEM 3015 or CHEM 3053 or consent of instructor). Examination of the hormonal control and regulation of physiological processes in vertebrates. Function of the hypothalamus, pituitary, adrenal, thyroid, pancreas, ovary and testes. No credit for students with credit in BIOL 5283. Previously offered as ZOOL 4283.

BIOL 4293 Behavioral Neuroendocrinology. Prerequisite(s): BIOL 3204 or BIOL 4215. Examination of the influences of nervous and endocrine systems on behavior, and vice-versa, in vertebrates, including humans. Historical roots and current techniques relating to topics, including male and female reproductive behavior patterns, sex differences in behavior and neuroendocrine causation. No credit for students with credit in BIOL 5293. Previously offered as ZOOL 4293.

BIOL 4303 Organismal Ecotoxicology. Prerequisite(s): BIOL 1114 or equivalent and (CHEM 1215 or CHEM 1314) and junior standing. Comparative study of the major groups of environmental contaminants (e.g. heavy metals, PCB’s, insecticides) and an introduction to the basic theories, principles and techniques associated with the study of contaminant fate and effects on organisms. No credit for students with credit in BIOL 5303. Previously offered as ZOOL 4303.

BIOL 4363 Principles of Toxicology. Prerequisite(s): BIOL 3204 and (CHEM 1215 or CHEM 1314). Basic concepts in toxicology such as chemical partitioning, dose response, toxicokinetics, toxicodynamics, and bioavailability. It will focus on the molecular and cellular mechanisms of toxicity of a few representative natural and man-made compounds. Case studies used to understand real-life scenarios. No credit for students with credit in BIOL 5363.

BIOL 4413* Biology of Fishes. Lab 1. Prerequisite(s): BIOL 1604. Ecology
and evolution of fishes with particular emphasis on physiology, morphology, behavior, and taxonomy; laboratory emphasis on Oklahoma species. Weekend field trips required. Previously offered as ZOOL 4413. 

**BIOL 4434** Limnology. Prerequisite(s): BIOL 3034 or (NREM 3012 and NREM 3013). This course provides an overview of the physical, chemical, and biological characteristics of inland habitats including lakes, reservoirs, streams, and wetlands. Previously offered as ZOOL 4434.

**BIOL 4446** Ornithology. Lab 3. Prerequisite(s): BIOL 1604. Classification, evolution, distribution, identification, life histories, and morphological, ecological, and behavioral adaptations of birds. Two weekend field trips required. Same course as NREM 4464. Previously offered as ZOOL 4464.

**BIOL 4524** Biological Laboratory Instrumentation. Lab 4. Prerequisite(s): CHEM 1515 and (BOT 1404 or MIRC 2123 or BIOL 1604 or equivalent or consent of instructor). Lecture and laboratory course in biological instrumentation use, theory, experimental design, maintenance, and troubleshooting. Topics include liquid handling systems, pH/ISE meters, electrophoresis, spectrophotometers, centrifuges, chromatography, thermocyclers, and DNA sequencers. No credit for students with credit in BIOL 5524. Same course as MICR 4524.

**BIOL 4700 Undergraduate Research Problems.** 1-4 credits, max 4. Prerequisite(s): Consent of instructor. Participation in faculty research or execution of a problem formulated by the student. Project will include the communication of research results in written and/or oral form. Previously offered as ZOOL 4700.

**BIOL 4710 Internships in Integrative Biology.** 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Student participation in a research project during an internship in Life Sciences related professional work setting. Graded on a pass-fail basis. Previously offered as ZOOL 4710.

**BIOL 4750 Honors Study in Integrative Biology.** 1-5 credits, max 5. Prerequisite(s): Honors Program participation. Individual study in the development of biological concepts. Extensive reading, literature search and special experimental design an individual problems course for the gifted student. Previously offered as ZOOL 4750.

**BIOL 5000* Research for Master's Thesis.** 1-6 credits, max 6. Independent research for the MS Thesis under the supervision of graduate faculty member. Previously offered as ZOOL 5000.

**BIOL 5003* Graduate Orientation and Academic Development.** Prerequisite(s): Approval of integrative biology graduate program or instructor approval. Prepare first year integrative biology graduate students for success. We address departmental expectations and standards by providing: an introduction to departmental expertise and capabilities, exposure to available tools and resources, a forum for research conceptualization and formulation, instruction on finding and securing funding, guidance on how to convert questions into grant proposals, and a milieu for preparation, submission and peer review of external grant/fellowships. Previously offered as ZOOL 5003.

**BIOL 5010* Graduate Seminar.** 1-3 credits, max 10. Discussion of selected topics. Previously offered as ZOOL 5010.

**BIOL 5011* Current, Historical and Integrative Principles in Integrative Biology.** Prerequisite(s): Admission to Integrative Biology graduate program or instructor approval. This course will furnish fundamental concepts in ecology, evolution, and environmental stress for first-year graduate students in Integrative Biology (and related departments). More importantly, this course is organized as a set of modules that bring together various elements from the three broadly defined and fundamentally related disciplines (i.e., ecology, evolution, and environmental stress), that our department views as our core strengths. Previously offered as ZOOL 5011.

**BIOL 5020* Special Problems.** 1-4 credits, max 10. Prerequisite(s): Graduate standing and consent of instructor. Discussions of selected readings and topics. Previously offered as ZOOL 5020.

**BIOL 5030* Teaching Integrative Biology.** 1-3 credits, max 4. Prerequisite(s): Consent of instructor. Supervised teaching in the department. Attendance at seminar on problems involved in teaching Integrative Biology in college. Previously offered as ZOOL 5030.

**BIOL 5100* Current Topics in Biology for Teachers.** 1-4 credits, max 4. Prerequisite(s): Approval of instructor. Acquaints the primary or secondary student with credit in BIOL 4293. Previously offered as ZOOL 5273.

**BIOL 5133* Evolutionary Ecology.** Prerequisite(s): BIOL 3034. This course is intended to inform students about the traditional breadth of evolutionary ecology, and its impacts on contemporary ecological and evolutionary theories. Study will include both broad historical precedent and the far-reaching importance of current research in evolutionary ecology. This course will develop skills in written and oral communication and critical/synthetic thought. Previously offered as ZOOL 5133.

**BIOL 5243* Ecological Immunology.** The causes and consequences of variation in immunity studied within the context of evolution and ecology. A combination of lectures and student-led presentations intended for graduate students and advanced undergraduates. Previously offered as ZOOL 5243.

**BIOL 5257* Environmental Physiology.** Prerequisite(s): BIOL 3204 or BIOL 4215 or equivalent. The study of animal adaptation and responses to natural freshwater, and terrestrial habitats as well as anthropogenic problems specific to these habitats. No credit for students with credit in BIOL 4273. Previously offered as ZOOL 5257.

**BIOL 5283* Endocrinology.** Prerequisite(s): A course in physiology and chemistry or consent of instructor. Examination of the hormonal control and regulation of physiological processes in vertebrates. Function of the hypothalamus, pituitary, adrenal, thyroid, pancreas, ovary and testes. No credit for students with credit in BIOL 4263. Previously offered as ZOOL 5283.

**BIOL 5303* Organismal Ecotoxicology.** Comparative study of the major groups of environmental contaminants (e.g. heavy metals, PCB’s, insecticides) and their introduction to the basic theories, principles and techniques associated with the study of contaminant fate and effects on organisms. No credit for students with credit in ITOX 5030 or BIOL 4430. Previously offered as ZOOL 5303.

**BIOL 5343* Population and Community Ecotoxicology.** Prerequisite(s): Consent of instructor. Ecology strongly recommended. Examines the effects of contaminants to environmental contaminants and resulting effects at the individual through community level. The dynamic nature of exposure to contaminants will be of particular interest in this course. For example, how do the natural history traits of a species either protect it from exposure, or enhance its potential for exposure to contaminants? Topics will range from the historical perspectives to ecotoxicology to study design and risk assessment. Same course as ITOX 5343. Previously offered as ZOOL 5343.

**BIOL 5363* Principles of Toxicology.** Prerequisite(s): Course in chemistry and physiology strongly recommended. Basic concepts in toxicology such as chemical partitioning, dose response, toxicokinetics, toxicodynamics, and bioavailability. It will focus on the molecular and cellular mechanisms of toxicity of a few representative natural and man-made compounds. Case studies used to understand real-life scenarios. No credit for students with credit in ITOX 4363.

**BIOL 5403* Advanced Wetland Ecology.** Prerequisite(s): A course in aquatic ecology or wetland management recommended. Principles and theory of wetland ecology with a focus on wetland processes, function, and services. Topics include wetland geomorphology, biogeochemistry and hydrology of wetlands, and wetland functioning and regulation of physiological processes in vertebrates. Function of the hypothalamus, pituitary, adrenal, thyroid, pancreas, ovary and testes. No credit for students with credit in BIOL 4263. Previously offered as ZOOL 5403. Previously offered as BIOL 5403.

**BIOL 5423* Techniques in Environmental Toxicology.** Lab 4. Prerequisite(s): Consent of instructor. Practical understanding of modern techniques used to quantify exposure and effects of environmental toxicants. Laboratory topics include gas chromatography, HPLC, atomic absorption spectroscopy, immunoassay, and toxicity testing. Same course as ITOX 5423. Previously offered as ZOOL 5423.

**BIOL 5503* Spatial Ecology and Analysis.** Prerequisite(s): Course in ecology strongly recommended. Theory, methods, and models for identifying and quantifying spatial patterns and processes, with a focus on implications for ecological relationships. Previously offered as ZOOL 5503.

**BIOL 5523* Population Ecology.** Prerequisite(s): BIOL 3034 and MATH 1513. This course covers principles of population ecology and dynamics. Life history theory, foraging theory, habitat selection, population genetics, and species interactions. Previously offered as ZOOL 5523.

**BIOL 5524* Biological Laboratory Instrumentation.** Lab 4. Prerequisite(s): CHEM 1515 and (BOT 1404 or MIRC 2123 or BIOL 1604 or equivalent or consent of instructor). Lecture and laboratory course in biological instrumentation use, theory, experimental design, maintenance, and troubleshooting. Topics include liquid handling systems, pH/ISE meters, electrophoresis, spectrophotometers, centrifuges, chromatography, thermocyclers, and DNA sequencers. No credit for students with credit in BIOL 4524. Same course as MICR 5524.
BIOL 5623* Ecological Data and Alternative Hypotheses. Prerequisite(s): Course in statistics strongly recommended. Emphasizes statistical analyses that start with a set of plausible alternative hypotheses and use likelihoods to quantify the relative support the hypotheses receive from empirical data. Instruction will be done with lectures, computer lab exercises, and in-class presentations. Previously offered as ZOOL 5623.

BIOL 5633 Ecological and Behavioral Modeling. Prerequisite(s): Course in ecology strongly recommended. This course will provide a general overview of modeling approaches for studying a variety of ecological and environmental problems. It will provide students with a toolbox of techniques, and discuss how they can be used to address questions and generate testable predictions. The course will emphasize modeling individual behavior and population dynamics. Previously offered as ZOOL 5633.

BIOL 5643* Ecological Niche Modeling and Species Distributions. Prerequisite(s): Course in ecology strongly recommended. Ecological niche modeling theory and practice. Generation of niche models and distribution predictions to address questions on species’ ecology, conservation, biogeography, and phylogeography. Familiarization with ESRI ArcGIS software, as well as environmental GIS data sources. Previously offered as ZOOL 5643.

BIOL 6000* Research for PhD Dissertation. 1-15 credits, max 60. Independent research for the PhD dissertation under the supervision of a graduate faculty member. Previously offered as ZOOL 6000.

Biomedical Sciences (BIOM)

BIOM 5000* Research and Thesis. 1-6 credits, max 6, Lab 1-6. Prerequisite(s): Consent of major adviser. Research in biomedical sciences for MS degree.

BIOM 5003* Statistics for Medical Residents. Prerequisite(s): Employed as a medical resident or permission of instructor. Survey of statistical methodology relevant to healthcare professionals. Basic understanding of statistics presented in recent medical literature. Hypothesis testing, ANOVA techniques, regression, categorical techniques. (Same course as STAT 5003).

BIOM 5010* Special Topics in Biomedical Sciences. Provides an overview of current issues in biomedical sciences.

BIOM 5013* Biomedical Statistics. Prerequisite(s): Graduate standing. Fundamentals of biostatistics, including parametric and non-parametric statistical methods with applications to biomedical research, clinical epidemiology and clinical medicine.

BIOM 5020* Biomedical Sciences Seminar. 1-4 credits, max 4. Prerequisite(s): Graduate standing. Literature and research problems in biomedical sciences.

BIOM 5116* Clinical Anatomy. Lab 3. Prerequisite(s): Graduate standing in the biomedical sciences program. Presents gross structure of the human body using a regional approach. Topics include topographical and functional anatomy, clinical correlations, and introduction to radiology. The course provides the descriptive basis for understanding human structure and function encountered in succeeding courses and medical practice.

BIOM 5122* Clinical Anatomy for Allied Healthcare. Lab 3. Gross structure of the human body using a regional approach including topographic and functional anatomy, and clinical correlations as appropriate for athletic trainers and allied healthcare professionals. Descriptive basis for understanding human structure and function encountered in professional practice.

BIOM 5261* Introduction to Translational Research. Focuses on biomedical and clinical research from bench to bedside and back. Provides examples of how basic science and clinical observations lead to translational research.

BIOM 5631* Disease Research in Medicine. Prerequisite(s): Biomedical Foundations or equivalent. Permission of instructor. Introduction to selected diseases of priority in medicine and to funding agencies. Includes discussing current clinical and research challenges.

BIOM 5641* Cornerstones of Vertebrate Paleontology. In-depth discussion of topics in Vertebrate Paleontology, emphasizing critical thinking skills. Based on evaluation of the pertinent literature, and covering diverse methodological approaches to interdisciplinary research questions.

BIOM 5653* Evolutionary Physiology. Survey course that covers the basic physiology of, primarily, mammalian species. Uses an evolutionary approach that integrates form with function by outlining the evolutionary sequences thought to have resulted in modern organ structures.

BIOM 5663* Graduate Pharmacology. Provides an enriched understanding of the mechanism of actions of pharmacological agents used to treat human diseases.

BIOM 5672* Scientific Outreach Training for Graduate Students. Provides interactive opportunities with elementary school-aged children with a particular emphasis on developing an understanding of the scientific method as a strategy for real-life problem solving.

BIOM 5683* Chronic Inflammation and Cancer Development. Provides insight that describes the issues of chronic inflammation, auto-immune and cancer development.

BIOM 5693* Principle Concepts of Cellular and Molecular Immunology. Introduces and explores basic concepts of immunology with cellular and molecular components that play a role in normal and disease states.

BIOM 5963* Case Studies in Medical Smart. Prerequisite(s): BIOM 4993 or DHM/EMI 4983 or consent of instructor. Designed to activate critical thinking skills needed for problem solving in wearable sensing system development. (Same course as DHM 5984).

BIOM 5984* Capstone in Medical Smart Garment Engineering. Prerequisite(s): BIOM or DHM 5963 and three credits of chosen emphasis area. Project-based where interdisciplinary teams identify a wearable sensing application and collaborate to engineer a prototype that addresses a defined need. Industry collaboration encouraged. (Same course as DHM 5984.)

BIOM 6000* Research and Dissertation. 1-15 credits, max 15, Lab 1-45. Prerequisite(s): Consent of major adviser. Research in biomedical sciences for PhD degree.

BIOM 6100* Topics in Biomedical Sciences. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Tutorials in areas of biomedical sciences not addressed in other courses.

BIOM 6103* Educational Methods in the Biomedical Sciences. Prerequisite(s): Graduate standing. Introduces graduate students to a full range of faculty roles and responsibilities related to instructional methods used at the health sciences center.

BIOM 6203* Research Methods and Design. Prerequisite(s): Graduate standing. Introduction to concepts of research design, methodology, sampling techniques, internal and external validity, and the scientific method.

BIOM 6175* Molecular and Cellular Biology. Prerequisite(s): Consent of course coordinator. Cell biology, including cellular macromolecules, energetics, metabolism, regulation, organization and function of cellular organelles, flow of genetic information, and the regulation of selected cell activities.

BIOM 6183* Cellular and Molecular Biology of Pain. Prerequisite(s): 5133 or 5616. An understanding of the cellular and molecular events that occur in the initiation and transmission of nociceptive (painful) sensory signaling.

BIOM 6214* Advanced Topics in Medical Biochemistry. Prerequisite(s): 5215 or concurrent enrollment. Chemical basis of protein, carbohydrate, lipid, nucleic acid, steroid and porphyrin structure, function, and metabolism as related to health and disease.

BIOM 6233* Enzyme Analysis. Lab 2. Prerequisite(s): 6214. Characteristics, separation, detection, assays, kinetics, mechanisms of catalysis, inhibition or inactivation, and clinical applications of enzyme analysis.

BIOM 6243* Human Nutrition. Lab 2. Prerequisite(s): 5215. Role of vitamins and minerals in maintaining normal metabolism, role of nutrients in providing athletic and immune system performance, and pathophysiology associated with nutrient deficits and nutrient excesses. Role of drugs in inducing cancer and increasing nutrient requirements.

BIOM 6263* Techniques in Molecular Biology. Lab 4. Prerequisite(s): 5215, 5316, consent of instructor. Transformation of bacterial and mammalian cells; purification of nucleic acids; cloning of DNA fragments; labeling of nucleic acids with non-radioactive probes; analysis of DNA and RNA by electrophoresis and hybridization; DNA sequencing; design, synthesis and use of oligonucleotides; site-directed mutagenesis; detection of rare nucleic acids by the polymerase chain reaction and expression of proteins.

BIOM 6323* Immunology. Prerequisite(s): 5215, 5316. The experimental basis of immunology and immunopathology.

BIOM 6343* Microbiol Physiology. Lab 2. Prerequisite(s): 5215, 5316. The chemical composition, growth and metabolism of prokaryotic organisms including regulation and control of metabolic pathways with emphasis on metabolism unique to microbes.

BIOM 6353* Molecular Virology. Lab 2. Prerequisite(s): 5215, 5316, consent of instructor. The fundamental molecular biology of the virus life cycle using one virus as a model to examine penetration, gene regulation, replication, assembly and egress, as well as host immunological response and epidemiology.

BIOM 6363* Immunobiology of Infectious Disease. Prerequisite(s): Biochemistry, Medical Microbiology and Immunology. Graduate course to provide an understanding of cellular and molecular events that occur during the initiation of immune response to main causes of human pathogens.

BIOM 6413* Graduate General Pathology. Prerequisite(s): Graduate standing and 5215; permission of the instructor is required. 5616 and 5316 are recommended. An introduction for biomedical researchers to disease processes, functional changes to cell and tissue responses that manifest as diseases.

BIOM 6523* Cardiovascular Physiology and Pharmacology. Prerequisite(s): 5513, 5523. Physiologic and pharmacologic mechanisms of cardiac and vascular smooth muscle function and control at the molecular, cellular, tissue and organ system levels.

BIOM 6543* Environmental Toxins in the Brain. Introduces the fundamental aspects of neurotoxicology using both cellular and molecular approaches in neurochemistry and toxicology.

BIOM 6583* Neuroinflammation. Prerequisite(s): Graduate standing. Provides an understanding of inflammation in the central nervous system through discussion of current and experimental pharmacologic strategies designed to
BIOM 6613* Environmental Physiology. Prerequisite(s): 5616. Environmental parameters, including barometric pressure, temperature, light, gravity, noise, and crowding, having an impact on homeostatic mechanisms in the normal human with special emphasis on acute and chronic adaptations in response to changes in environmental parameters.

BIOM 6643* Neurophysiology. Prerequisite(s): 5616. Fundamental concepts of the major sensory and motor components of the nervous system with emphasis on integrative mechanisms.

BIOM 6662* Research Ethics and Survival Skills for the Biomedical Sciences. Prerequisite(s): Consent. This course introduces the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will include students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping).

BIOM 6705* Advanced Gross Anatomy. Lab 4. Prerequisite(s): Consent of course coordinator. General and specific concepts of regional human anatomy. The primary focus is the range of normal for all organ systems and interrelationships. Provides an advanced descriptive basis for understanding human structure and function encountered in succeeding courses and in the practice of teaching gross anatomy to graduate and medical students.

BIOM 6713* Applications of GIS in Evolutionary Biology. This course introduces students to the applications of Geographic Information Systems (GIS) in Evolutionary Biology. The course will emphasize applications of GIS in teaching paleoecology and vertebrate paleontology (e.g., tooth morphology and mapping). The lecture portion will introduce students to the appropriate literature and provide discussions on evolutionary theories and uses of GIS to test such theories, while the laboratory portion will provide hands-on exercises with GIS software.

BIOM 6723* Field Techniques in Vertebrate Paleontology. This course introduces students to techniques and tools necessary to conduct field work in vertebrate paleontology. The primary techniques will include mapping, prospecting and collecting both micro- and macrofossil vertebrate remains. Processing of rock matrix with microvertebrates will be emphasized, but preparation of macrofossil remains for transportation to the research lab will be taught.

BIOM 6733* Microbial Pathogenesis. Prerequisite(s): BIOM 6791/PCME 8791, consent of instructor. An in-depth introduction to the fundamental principles and molecular mechanisms by which microbes cause disease in humans. Focuses on current research and provides a comprehensive overview of the molecular basis of pathogenesis with a focus on prokaryotic and eukaryotic model microbial systems to illustrate mechanisms of disease pathogenesis. Discusses the role of the microbiome in health and disease.

BIOM 6743* Foundations in Medical Genetics, Molecular Biology and Development. Human genetics and development, including structure and function of nucleic acids, gene regulation, basis of inheritance, and development of the human embryo.

BIOM 6752* Foundations in Medical Cell and Tissue Biology. Structure and function of cells within tissues as it relates to human health and disease, including cell transport, cell-to-cell communication and organ system control.

BIOM 6762* Foundations in Medical Biochemistry. Biochemistry in human health and disease, including protein structure and function, bioenergetics, metabolism, nutrition, and membrane structure and function.

BIOM 6771* Foundations in Medical Pharmacology. General principles of pharmacokinetics and pharmacodynamics of drugs used to treat human disease.

BIOM 6781* Foundations in Medical Immunology. Immune system in human health and disease, including antibody and cell-mediated immune responses, inflammation, immune responses to infectious agents and allergens, immunodeficiencies and malignancies of the immune system.

BIOM 6791* Foundations in Medical Microbiology. Infectious agents, including viruses, fungi, and parasites, their structure, genetics and mechanisms of pathogenesis in human disease.

BIOM 6800* Critical Readings in Biomedical Sciences. Offered for variable credit, 1-3 credit hours, maximum of 3 credit hours. Provides experience with the primary literature in biomedical sciences, with training in evaluation methodologies, experimental design, data presentation, and statistical designs. Previously offered as BIOM 6802.

BIOM 6810* Structure and Function of the Human Cardiovascular System. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the human cardiovascular system.

BIOM 6820* Structure and Function of the Human Gastrointestinal/ Hepatic System. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the human gastrointestinal and hepatic systems.

BIOM 6830* Biomedical Perspectives on Human Hematology. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the human blood and lymphatics, and associated disorders.

BIOM 6840* Structure and Function of the Human Musculoskeletal System. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the human musculoskeletal system and associated disorders.

BIOM 6850* Structure and Function of the Human Renal System. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the human renal system.

BIOM 6860* Structure and Function of the Human Reproductive Systems and Reproductive Biology. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the male and female human reproductive systems and reproductive biology.

BIOM 6870* Structure and Function of the Human Respiratory System. Prerequisite(s): Permission of Instructor. Provides integrated biomedical study of the human respiratory system.

BIOM 6880* Biomedical Perspectives on Psychiatry. Prerequisite(s): Permission of Instructor. Provides clinical presentation, differential diagnosis, etiology (including pathophysiological etiologies), basic pharmacology of medications used to treat the disorder, clinical pharmacology, and psychosocial treatments.

BIOM 6893* Fundamentals of Medical Smart Garment Engineering. Prerequisite(s): Graduate standing or 90+ credit hours. Students will gain elementary knowledge in focus areas of health science, biomedical sensing and analysis, and apparel design necessary to understand the development of wearable electronic sensing systems. Lecture and laboratory systems. May not be used for degree credit for IEM 4893*, 5893* or DHM 4893*.

BIOM 6910* Structure and Function of the Human Nervous System. Provides integrated biomedical study of the human nervous system.

BIOM 6900* Structure and Function of the Human Endocrine System. Provides integrated biomedical study of the human endocrine system, and associated disorders.

BIOM 6922* Scientific Communication in Biomedical Sciences. Provides experience in scientific writing and oral presentations.

BIOM 6933* Cornerstones of Graduate Biomedical Sciences. Discussion topics in the foundational courses of biomedical sciences, emphasizing critical thinking skills and diverse methodological approaches in understanding interdisciplinary research questions and in evaluations of the primary literature. Intended to be taken concurrently with foundation courses.

BIOM 6943* Advanced Vertebrate Paleontology. Prerequisite(s): Comparative anatomy or human anatomy, and assumes an undergraduate level understanding of vertebrate anatomy, biology, and evolution. Explores vertebrate evolution in a phylogenetic, ontogenetic, and stratigraphic framework using selected peer reviewed articles. Students will lead discussions and practice critical thinking skills to address topics presented. Students will apply what they have learned to lead dissections of specimens belonging to a specific extant phylogenetic bracket.

BIOM 6952* Paleohistology Techniques. Prerequisite(s): Undergraduate level understanding of biology, evolution, and histology. Recognize and interpret modern and fossil bone tissue microstructures. The contributions of paleohistology to understanding extinct vertebrate physiology will be explored through discussions of peer reviewed articles. Students will receive hands-on training in paleohistology techniques.

BIOM 6962* Evolutionary Biomechanics. Prerequisite(s): BIOM 5116* or HHP 2654 or ZOOL 3114*. Evaluation of topics covering the application of engineering principles to biological systems in an evolutionary framework. Topics will examine the material properties of anatomical tissues, how forces act internally and externally on organisms and their structures, kinematics, and biomechanical model systems. Primary literature and experimental designs will also be explored.

Biosystems and Agricultural Engineering (BAE)

BAE 1012 Introduction to Biosystems Engineering. Lab 2. Prerequisite(s): Engineering major. Introduction to the Biosystems Engineering discipline; use of computers in solving engineering problems; and the application of software in engineering analysis and reporting.

BAE 1022 Experimental Methods in Biosystems Engineering. Lab 2. Prerequisite(s): 1012 or consent of instructor. An introduction to the basics of instrumentation, measurement techniques, and data analysis, with an emphasis on written communication skills. Lecture and laboratory exercises that address measurement principles, including accuracy, precision and error analysis.

BAE 2013 Modeling in Biosystems Engineering. Prerequisite(s): BIOL 1114 and MATH 2144. Introduction and modeling of various applications in biosystems and agricultural engineering. Case studies that emphasize the
interface between engineering and biology in areas such as plant systems, industrial biological processes, sensor and control systems development, intelligent machine design, environmental remediation, water treatment systems and food processing. Use of a fourth generation programming language for solving engineering problems.

**BAE 2032 Physical Properties of Biological Materials.** Lab 2. Prerequisite(s): 1022, BIOL 1114, PHYS 2014. Basic engineering fundamentals applied to characterization and determination of physical properties of biological materials, including water relations, rheological, thermal, and electromagnetic properties materials, focusing concepts, fans, psychrometrics and refrigeration.

**BAE 3043 Heat and Mass Transfer in Biotechnological Systems.** Prerequisite(s): ENSC 3233, MATH 2233. Mechanisms of heat and mass transfer, with specific applications in transport processes of biological systems. Introduction to steady state and transient heat conduction and convection, radiation, diffusion, simultaneous heat and mass transfer.

**BAE 3023 Instruments and Controls.** Lab 2. Prerequisite(s): ENSC 2613, MATH 2233. Design of control and instrumentation systems, including sensor and actuator principles, interface electronics, system identification, modeling, and performance specification. Applications in biological and agricultural systems. Design project required.

**BAE 3113 Biological Applications in Engineering.** Prerequisite(s): 2012, BIOL 1114, ENSC 2213, 3233, MATH 2233 or equivalent. Introduction to engineering applications of biological processes. Technologies covered include fermentation systems, enzyme kinetics, wastewater treatment and bioremediation.

**BAE 3213 Energy and Power in Biosystems Engineering.** Lab 2. Prerequisite(s): 1022, ENSC 2213, 2613, ENSC 2143 or concurrent enrollment. Analysis and design of energy system models, transmission, and utilization in the production and processing of biological materials.

**BAE 3313 Natural Resources Engineering.** Lab 3. Prerequisite(s): 2023 , STAT 2013, and ENSC 3233 or concurrent enrollment. Principles and practices of engineering analysis and design applied to hydrology, water quality, erosion and sedimentation, air quality, water supply and demand, pollution and animal waste management.

**BAE 4001 Professional Practice in Biosystems Engineering.** Prerequisite(s): Concurrent enrollment in 4012. Preparation for professional practice through case studies about ethics, legal liability, safety, and societal issues. Practical professional communications experience.

**BAE 4012 Senior Engineering Design Project I.** Lab 2. Prerequisite(s): EAE 4001, 4011, and concurrent enrollment in BAE 4113, ENSC 3311. Admission to professional school. Team 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.

**BAE 4023 Senior Engineering Design Project II.** Lab 4. Prerequisite(s): BAE 4012; completion or concurrent enrollment in BAE 3013, BAE 3023 and BAE 3213. Second of two-semester sequence of senior design courses.

**BAE 4213* Precision Agriculture.** Lab 2. Prerequisite(s): MATH 1513, senior standing. Introduction to the concepts of precision agriculture including analysis of spatial distributions of fertility and crop response, geographical information systems, variable rate technology, optical sensing, global positioning systems, and yield monitoring. Case studies included for detailed analyses. (Same course as SOIL 4213)

**BAE 4224* Machinery for Production and Processing.** Prerequisite(s): 3213. Analysis and design of machine components and machine systems for production and processing of biological materials. Soil dynamics with emphasis on traction and soil compaction. Interactions of machines with biological systems.

**BAE 4283* Bioprocess Engineering.** Prerequisite(s): 3013, 3113 or consent of instructor, ENSC 3233. Application of fundamental engineering principles to biochemical and biological processes. Introduction to cellular processes, fermentation technology, production and control of microorganisms and fermentation systems, and yield monitoring. Case studies included for detailed analyses. (Same course as CHE 5283)

**BAE 4314* Hydrology.** Prerequisite(s): 3013, 3313, ENSC 3233. Basic principles of surface and groundwater hydrology and their application in engineering problems. The hydrologic cycle, weather and hydrology, precipitation, evaporation, transpiration, subsurface waters, stream flow hydrographs, hydrologic and hydraulic stream routing, probability of hydrologic events and application of hydrologic models. Laboratory component will emphasize the application of hydrologic and hydrogeologic models and the quantification of hydrologic and hydraulic parameters.

**BAE 4400 Special Problems.** 1-4 credits, max 8. Investigations in specialized areas of biosystems engineering.

**BAE 4413* Food Engineering.** Prerequisite(s): 3013 and ENSC 3233, 2213. Analysis and design of various unit operations in food processing including thermal processing, drying, evaporation, freezing, processing non-Newtonian fluids and quality changes during processing.

**BAE 5000* Master’s Research and Thesis.** 1-6 credits, max 6. Prerequisite(s): Consent of major professor. Research and thesis writing.

**BAE 5030* Problems in Biosystems Engineering and Agricultural Technology.** 1-6 credits. Prerequisite(s): Consent of instructor. Problems associated with biosystems engineering and agricultural technology.

**BAE 5213* Renewable Energy Engineering.** Prerequisite(s): ENSC 2213, ENSC 3233 or consent of instructor. Renewable technologies such as solar, wind, geothermal, hydroelectric, and biomass to generate energy for electricity, heating, transportation, and other uses.

**BAE 523* Bioseparations.** Prerequisite(s): 3013 or CHE 3013. Study of separations important in food and biochemical engineering such as leaching, extraction, expression, absorption, ion exchange, filtration, centrifugation, membrane separation, and chromatographic separations. Course available online only through AG*IDEA consortium.

**BAE 5243* Biological Conversion for Advanced Biofuels.** Prerequisite(s): ENSC 2213. Fundamental principles and applications of converting biomass to advanced biofuels. Focus will be on biomass and advanced biofuels, fermentor design and operation, product recovery and emerging fuels.

**BAE 5283* Advanced Bioprocess Engineering.** Prerequisite(s): Consent of instructor. Application of fundamental engineering principles to biochemical and biological processes. Introduction to cellular processes, fermentation technology, biological mass transfer and kinetics, bioreactor design and scale-up and downstream processing. (Same course as CHE 5283)

**BAE 5313* Watershed Modeling and Water Quality.** Lab 6. Prerequisite(s): 4313 or equivalent. A computer modeling course with an emphasis on chemical and physical processes governing nonpoint source pollution (nitrates, phosphorus, sediment) at the watershed scale. The lab will use state-of-the-art models applied to a variety of agricultural systems. "Hands on" use of comprehensive hydrologic water quality models that utilize spatial data in a geographic information system. Models and parameter uncertainty, digital data sources, parameter estimation, model testing, calibration and validation. For students with advanced personal computer skills.

**BAE 5324* Modeling and Design in Storm Water and Sediment Control.** Lab 3. Prerequisite(s): 4313 or equivalent. Analysis and design of storm water and sediment water quality systems with a focus on application to urban areas and small developments in the urban fringe. Advanced concepts in hydrologic modeling with kinematics, diffusion and dynamic modeling of flow; soil erosion, sediment transport and sediment control; storm water quality modeling and the impact of best management practices. In laboratories, use of hydrologic, sediment, and water quality models in analysis and design for real-world problems.

**BAE 5333* Applied Water Resources Statistics.** Lab 3. Prerequisite(s): STAT 5013 or equivalent. Applied statistical methods for hydrologists, engineers, and environmental scientists for analysis of environmental data. Parametric and nonparametric methods and exploratory data analysis applied to observed environmental data sets. Laboratory exercises emphasize hands-on application of statistical problems to reinforce concepts.

**BAE 5343* Environmental Contaminant Transport.** Prerequisite(s): 4313. Conceptual and mathematical models for the transport of contaminants in natural systems with an emphasis on agricultural pollutants. Basic transport processes relevant to the three environmental media - air, water, and soil. Common features underlying pollutant transport.

**BAE 5353* Environmental and Ecological Risk Assessment.** Prerequisite(s): Graduate standing. Process and methodologies associated with human and environmental and ecological risk analysis. Hands-on projects that will improve system design, development and programming skills. Introduction of advanced topics including machine vision, spectroscopy, and data communication networks.

**BAE 5423* Food Rheology.** Lab 2. Prerequisite(s): ENSC 3233. Characterization and analysis of the rheological properties of food products. Focus on measurement techniques and equipment, including tube and rotational type instruments, with specific applications in food processing.

**BAE 543* Biosensors.** Prerequisite(s): PHYS 2114 and CHEM 3051 or equivalent. Principles and applications of biosensors in food analysis, disease diagnostics, and environmental monitoring. Emphasis on conceptual design and characterization of biosensors. Introduction to recent advances in biodetection using nanotechnology.

**BAE 5501* Seminar.** Discussion of current literature with special emphasis on research and experimental techniques.

**BAE 6000* Doctoral Research and Dissertation.** 1-10 credits, max 42. Prerequisite(s): Approval by dissertation advisory committee. Doctoral dissertation preparation.

**BAE 6101* Teaching Practicum in Biosystems Engineering.** Prerequisite(s):
One semester of doctoral study in Biosystems Engineering, or consent of instructor. Philosophies and techniques of resident and non-resident teaching, including experiences in preparation, presentation, and evaluation of lectures, laboratories, extension or continuing education programs.

Bae 6213* Advanced Biomass Thermochemochemical Conversion. Prerequisite(s): ENSC 2213. Advanced study, evaluation, and application of thermochemochemical conversion pathways in biofuels production. Specific topics include biomass gasification, pyrolysis, liquefaction, and heterogeneous catalysis. Course available online only through AG*IDEA consortium.

Bae 6313* Stochastic Methods in Hydrology. Prerequisite(s): CIVE 5843, STAT 4003. Stochastic and statistical hydrologic analyses of surface water and groundwater systems. Analysis of urban and rural drainage and detention systems. (Same course as CIVE 6843)

Bae 6333* Fluvial Hydraulics. Prerequisite(s): 3013 or equivalent. Principles of sediment detachment and transport in fluvial systems. Design of stable channels and flow resistance relationships for sediment-laden flows.

Bae 6343* Ground Water Contaminant Transport. Prerequisite(s): SOIL 5583 or CIVE 5913 or GEOL 5453. Principles of solute and multiphase transport in soils and ground water. Effects of advection, diffusion, dispersion, degradation, volatilization and adsorption. Relationships between laboratory and field scale transport. Contamination by nonaqueous phase liquids.

Bae 6520* Problems in Soil and Water Engineering. 2-6 credits, max 6. Prerequisite(s): Consent of instructor. Problems associated with erosion control, drainage, flood protection and irrigation.

Bae 6540* Problems in Farm Power and Machinery. 2-6 credits, max 6. Prerequisite(s): consent of instructor. Literature review and analytical studies of selected farm power and machinery problems. Written report required.

Bae 6580* Problems in Transport Processes. 2-6 credits, max 6. Prerequisite(s): Consent of instructor. Literature review and analysis of heat and mass transport and interface diffusion in biological materials. Transport phenomena 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.

Bae 6610* Advanced Research and Study. 1-10 credits, max 20. Prerequisite(s): 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)

Bot 1404 (L,N) Plant Biology. Lab 2. Basic concepts in the biology of plants from the perspective of structure and function, ecology, evolution, and diversity.

Bot 3005 Field Botany. Lab 6. Prerequisite(s): BIOL 1114 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 control of ecological populations, economic and wildlife significance of dominant taxa, principles of classification and nomenclature. Four weekend field trips required.

Bot 3013* Biological Microtechnique. Lab 3. Prerequisite(s): BOT 1404 and BIOL 1604. Techniques for preparation of biological materials for microscopic examination.

Bot 3024* Plant Diversity. Lab 4. Prerequisite(s): 1404. 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.


Bot 3233* Plant Anatomy. Lab 3. Prerequisite(s): 1404. Structure of cells, tissues and organs of plants. Consideration of structure as related to ontogeny, phylogeny and function.

Bot 3253 (N) Environment and Society. Prerequisite(s): At least one college level science course strongly recommended. The environmental impacts of human activities and population growth on the natural world, and possible solutions.

Bot 3263 (N) Plants and People. Study of how plant use has changed the course of world history. This includes the uses of plants and plant products for food and beverages, fiber, and medicinal and pharmaceutical purposes.

Bot 3462 Plant Physiology Laboratory. Lab 4. Prerequisite(s): 3463 or concurrent enrollment. Skills in techniques for working with plants, experiments involving nutrition, respiration, photosynthesis, water relations, translocation, hormones, growth and development.

Bot 3463* Plant Physiology. Prerequisite(s): 1404. Plant subcellular structure, water relations, water absorption and ascent of sap, translocation, gaseous exchange, nutrition, enzymes, respiration, photosynthesis, growth, development, reproduction, tropisms, hormones, dormancy and seed germination.

Bot 3553 Fungi: Myths and More. Lab 2. Prerequisite(s): BIOL 1114. Explores the impact of fungi on beliefs, culture and society via the colorful folklore and myths on fungi and their role in the environment and human affairs, including diseases of plants, animals and humans exemplified by the Great Bengal famine of 1943, The Irish potato famine, 1840's and the Salem witch trials 1692. Laboratory instruction on use of microscopes, mushroom identification, mechanisms of dispersal, and genetic recombination. (Same course as PLP 3553)

Bot 4023 Community Ecology. Prerequisite(s): 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. No credit for students with credit in 5023.

Bot 4214 Ecology of Algae and Aquatic Plants. Lab 3. Prerequisite(s): Two of the following (or equivalents) recommended: BOT 3005, 3463, BIOL 3034. Ecological physiology, evolution, and ecology of algal flora, function of algae and aquatic plants; problem algal blooms; ecological principles applied to algal biofuels. Laboratory includes basic identification of algae and aquatic plants. Field trips required, with fee. No credit for students with credit in 5214.

Bot 4400 Undergraduate Research. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Undergraduate research problems in botany.

Bot 4423 Plant Mineral Nutrition. Prerequisite(s): 3463 or equivalent. Uptake, translocation, metabolism, and biochemical function of mineral nutrients in higher plants. No credit for students with credit in 5423.

Bot 4990 Independent Study in Botany. Prerequisite(s): Consent of instructor. Independent study under the supervision of a faculty member. This will include readings and discussion on a selected topic agreed upon between the student and instructor.

Bot 4993 Senior Honors Thesis. Prerequisite(s): 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 the annual departmental seminar. Required for graduation with departmental honors in botany.

Bot 5000 Master's Thesis. 1-6 credits, max 6. Thesis work for the MS degree.

Bot 5023* Community Ecology. Prerequisite(s): 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. No credit for students with credit in 4023.

Bot 5104* Mycology. Lab 2. Prerequisite(s): Graduate standing. A systematic study of the fungi, with emphasis on taxonomy, comparative morphology, and functional biology. Taught in the Department of Entomology and Plant Pathology. (Same course as PLP 5104)

Bot 5110* Special Topics in Botany. 1-5 credits, max 24. Prerequisite(s): Consent of instructor. Special studies in any area of botany.

Bot 5210* Research in Botany. 1-6 credits, max 12. Prerequisite(s): Consent of instructor. Independent research in any area of botany or plant biology.

Bot 5214* Ecology of Algae and Aquatic Plants. Lab 3. Prerequisite(s): Two of the following (or equivalents) recommended: BOT 3005, 3463, BIOL 3034. Ecology, physiology, evolution, and ecological roles of algae and vascular aquatic plants; problem algal blooms; ecological principles applied to algal biofuels. Laboratory includes basic identification of algae and aquatic plants. Field trips required, with fee. No credit for students with credit in 4214.

Bot 5423* Plant Mineral Nutrition. Prerequisite(s): 3463 or equivalent. Uptake, translocation, metabolism, and biochemical function of mineral nutrients in higher plants. No credit for students with credit in 4423.

Bot 5533* Multivariate Methods in Community Ecology. Prerequisite(s): BIOL 5023 or BIOL 3034 or other equivalent course work in ecology recommended. Basic knowledge of statistics desirable. Methods used by ecologists to analyze community data and community patterns, including ordination and modern regression techniques. One weekend field trip required.

Bot 5541* Phylogenomics. Current topics in the theory and application of genome and transcriptome sequencing to phylogenetics, prediction of gene function, and evolution of genes.

Bot 5553* Molecular Phylogenetic Analysis. Prerequisite(s): Undergraduate genetics strongly recommended. Covers the use of molecular sequence data to construct evolutionary trees. It integrates theory and computer applications to answer questions involving species relationships, gene evolution, molecular evolution and morphological change, co-evolution, and biogeographic relationships.

Bot 5563* Plant Ecological Genetics. Prerequisite(s): BIOL 3023 and BIOL 3034 or BIOL 4133. Basic concepts in plant population and quantitative genetics, focusing on techniques that reveal the genetic structure and the adaptive value of ecologically relevant traits.

Bot 5850* Botany Seminar. 1 credit, max 6. Weekly one-hour seminar series on plant and internal systems. Botany MS and PhD Plant Sciences (Botany) students are required to present a minimum of two seminars, including one on an approved research proposal and one on thesis or dissertation results.
BADM 1103 (DS) Social and Behavioral Foundations of Business. Organizational management is about problem solving through modifying human behavior within a social and behavioral context. This course abstracts business concepts to provide a broad social and behavioral theoretical foundation for any specialized field of study. Throughout reading, observation, and decision-making, students enhance critical analysis and problem solving skills. Reflection and writing aid appreciation of business issues as human behavioral reaction and social interactions. May not be used for degree credit with BADM 3101.

BADM 1111 Business Freshman Seminar. Prerequisite(s): Freshman standing only and Spears School of Business or undeclared student. Required of all first semester freshmen in the Spears School of Business. An orientation to the SSB and OSU, survival skills, and a study of the career opportunities and curriculum in the various business departments.

BADM 2010 Special Topics. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Special topics and independent study in business.


BADM 2093 (I) Study Abroad: Contemporary International Culture and Business Impacts. A study of a country and region that will provide an integrated approach to the rich cultural, commercial, historical, technological, political, economic, and religious issues. The country's role as a political and economic power will be examined. Comparisons of technology, policies, and economies will be made, as well as investigating hurdles and synergies to doing business between that country and the U.S.

BADM 3090 (I) Study Abroad. 1-18 credits, max 36. Prerequisite(s): Consent of the Study Abroad office and associate dean of the college. Participation in an OSU reciprocal exchange program.

BADM 3101 (D) Diversity Impacts on Business. Diversity issues within major business theories. Through reading, observation, discussion, and writing, students will have their own perceptions of others challenged to better understand perspectives from different diverse populations. May not be used for degree credit with BADM 1103.

BADM 3201 Career Planning and Job Search Strategies. Develop an understanding of the importance and relevance of the entire career planning process, express career objectives in a concise manner, acquire an understanding of the job market from the perspective of both a job seeker and an employer, prepare professional application materials, and analyze the advantages and disadvantages of various job search strategies.

BADM 4010 Business Projects. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Special advanced topics, projects and independent study in business.

BADM 4050* Business Colloquium. 3-9 credits, max 9. Prerequisite(s): Junior standing and consent of the instructor or the dean. Study of the 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.

BADM 4090 International Proficiency Field Experience for Business. A cohort experience and study of a country and region that will ground the rich cultural, commercial, historical, technological, political, economic, and religious issues which have been explored through directed language and general education study. The country’s role as a political and economic power will be examined. Comparisons of technology, policies, and economies will be made, as well as investigating hurdles and synergies to doing business between that country and the U.S.

BADM 4093 (I) Study Abroad: Business Impacts of Contemporary International Culture. Prerequisite(s): Junior standing. A study of a country and region that will provide an integrated approach to the rich cultural, commercial, historical, technological, political, economic, and religious issues. The country's role as a political and economic power will be examined. Comparisons of technology, policies, and economies will be made, as well as investigating hurdles and synergies to doing business between that country and the U.S.

BADM 5013* Research Methods for Business. Prerequisite(s): STAT 2023, admission to MBA program or approval from MBA director; Role of Bayesian and inferential statistics in business research and management decision-making. Measurement, scaling, survey methods, and forecasting. Applications to marketing, managerial, human resource, financial and production planning; and other related business topics. Use of computers in statistical analysis.

BADM 5093* Study Abroad: Applied Business Studies. A study of a country and region that will provide an integrated approach to the rich cultural, commercial, historical, technological, political, economic, and religious issues. The country’s role as a political and economic power will be examined. Comparisons of technology, policies, and economies will be made, as well as investigating hurdles and synergies to doing business between that country and the U.S.

BADM 5200* Selected Master of Business Administration Topics. 3-6 credits, max 6. Prerequisite(s): Admission to the MBA program. Selected topics dealing with business decision-making and contemporary business issues.

BADM 5513* Fundamentals of Business Analytics. Prerequisite(s): Graduate standing in the SSB or permission from the MBA/MS/MSTM director or assistant director, or instructor. Introduction to a set of analytic tools, including exploratory and graphical techniques, variable associations, simple regression, multiple regression, decision trees, logistic regression, segmentation, RFM, design of experiments, and forecasting techniques, and use of tools for better business decisions.

BADM 5713* Analysis of the Multinational Firm. Prerequisite(s): 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 on understanding of the political, social, and cultural impact of the country and region that will provide an integrated approach to the rich cultural, commercial, historical, technological, political, economic, and religious issues. The country's role as a political and economic power will be examined. Comparisons of technology, policies, and economies will be made, as well as investigating hurdles and synergies to doing business between that country and the U.S.

BADM 6000* Research and Thesis. 1-9 credits, max 30. Prerequisite(s): Approval of advisory committee.

BADM 6100* Seminar in Business Administration. 3-6 credits, max 12. Prerequisite(s): Consent of instructor. Interdisciplinary in nature, focused on research methodology.

BADM 6343* Advanced Methods in MSIS Research. Prerequisite(s): Doctoral standing. Development of advanced methodological skills necessary to carry out research in the chosen area of study. Skills related to any one of the areas within the broad, interdisciplinary field of management science and information systems, such as management information systems, management science, telecommunications, and operations management. (Same course as MSIS 6343)

BADM 6353* Advanced Methods in Management Research. Prerequisite(s): Doctoral student standing and consent of instructor. Course examines issues in theory building and development, strategies for collecting behavioral research data. 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. (Same course as MGM 6353)

BADM 6513* Org Science I: Micro Issues in Business. Prerequisite(s): Permission from the Director of the PhD option in Executive Research. Provides an overview of the topics and research in behavior primarily at the individual and team level from different domains in business such as consumer behavior in marketing, organizational behavior in management, and behavioral research in accounting.

BADM 6532* Org Science II: Macro Issues in Business. Prerequisite(s): Permission from the Director of the PhD option in Executive Research. Examines topics and research in business focusing particularly on the major theories applicable at the SBU, firm level and above. Topics include theories of organizational culture, agency theory, transaction cost theory, pricing theories, corporate governance and control, entry mode choice, and CEO compensation strategies. Each topic is introduced through a review of seminal theories which are then reinforced with current research that applies and/or tests these theories.

BADM 6533* Creativity, Innovation and Leadership. Prerequisite(s): Permission from the Director of the PhD option in Executive Research. Examines the creative process and the role of leadership in driving the creative process within organizations. Covers issues such as works of genius, everyday problem solving, the role of intuition, innovative environments, creative analysis, creative leadership, consumer creativity, and co-creation. The foundation of each topic is theory-driven research with an occasional management practice perspective.

BADM 6713* Theory Building and Scientific Research in Business. Prerequisite(s): Doctoral student status and consent of instructor. Examination of theory building and research methods from a business perspective. Understanding of theory and methods relevant to research in the business disciplines.

BADM 6723* Dissertation Design. Prerequisite(s): Permission from the Director of the PhD option in Executive Research. Introduces doctoral candidates to the dissertation-writing process. Helps students get organized, prepare a dissertation timeline, develop effective writing strategies, choose or refine a dissertation topic, write a dissertation proposal, and successfully defend a completed dissertation.

BADM 6913 Mixed Methods in Management Research. Prerequisite(s): Permission from the Director of the PhD option in Executive Research. Introduces students to both quantitative and qualitative research methodologies, including designs for data collection and analysis. Addresses the integration of qualitative and quantitative design methodologies in studying organizational issues.

Business Analytics (BAN)

BAN 5100* Professional Development in Business Analytics. Prerequisite(s): Admission to the MS in Business Analytics program or consent
of director of MS in Business Analytics. Career and professional development of MS in Business Analytics students. A blend of guest speakers, projects, and exercises used to better prepare students for advanced business analytics careers.

**BAN 5400** Practicum in Business Analytics. Prerequisite(s): Consent of director of MS in Business Analytics and satisfactory completion of nine hours of BAN 5000- or MKTG 5000-level courses. Professional supervised experience in business analytics projects for which the student assumes a degree of professional responsibility. Activities approved in advance by the instructor and must reflect graduate level analysis. May consist of full or part-time business analytics experience, on-campus or in industry, or both, either individually or as a responsible member. Periodic reports, both oral and written, required as specified by the instructor.

**BAN 5511** Web Analytics and Digital Marketing. Prerequisite(s): Admission in MS in Business Analytics or consent of director of MS in Business Analytics or consent by instructor. Learn how to use web analytics tools and techniques to improve digital marketing.

**BAN 5521** GIS Applications in Marketing Analytics. Prerequisite(s): Admission in MS in Business Analytics or consent of director of MS in Business Analytics or consent by instructor. Learn how to use geographical information systems (GIS) as a methodological tool and analyze spatial data to make better marketing decisions.

**BAN 5530** Consulting in Marketing Analytics. Prerequisite(s): Admission in MS in Business Analytics or consent of director of MS in Business Analytics or consent by instructor. Learn how analytics consultants must communicate with clients to establish relationships, build trust, propose solutions, handle objections and otherwise effectively manage the relationship aspect of the engagement.

**BAN 5541** Using R in Marketing Analytics. Prerequisite(s): Admission in MS in Business Analytics or consent of director of MS in Business Analytics or consent by instructor. Learn how to use the R computing environment (and language) for analytics applications. The focus of the course will be on the usage of R and various R packages for analytics applications and not the theory or discussion behind various analytics techniques.

**BAN 5551** Optimization Applications in Marketing Analysis. Prerequisite(s): Admission in MS in Business Analytics or consent by instructor. This course provides an introduction to practical applications of mathematical programming/operations research using SAS/OR.

**BAN 5733** Descriptive Business Analytics. Prerequisite(s): Consent of director of MS in Business Analytics or by instructor. Learn how to describe and analyze business data using visualization and statistical tools. Topic coverage will include different types of graphs and plots, cross-tabs, variable associations, regression, ANOVA and other related models. An overview of basic probability concepts and statistical sampling techniques will also be provided. This course will primarily use SAS® Analytics platform to analyze data. Students may not take both MKTG 5733 or BAN 5983 and BAN 5733 for degree credit.

**BAN 5743** Predictive Business Analytics. Prerequisite(s): BAN 5733 or consent by instructor. Learn how to use predictive analytic tools such as logistic regression, neural networks, decision trees, and other classification and prediction models to generate deeper business insights and to improve business decision making. This course will primarily use SAS® Analytics platform to analyze data. Students may not take both MKTG 5743 or MKTG 5983 and BAN 5743 for degree credit.

**BAN 5753** Advanced Business Analytics. Prerequisite(s): BAN 5743 or consent by instructor. Learn how to use advanced modeling techniques such as Self Organizing Maps (SOM) and Kohonen Networks, two-stage models, survival models, credit scoring models, time series forecasting models, advanced text analytics etc. to improve business decision making. This course will primarily use SAS® Analytics platform to analyze data. Students may not take both MKTG 5883 and BAN 5753 for degree credit.

**BAN 5763** Advanced Marketing Research Analytics. Prerequisite(s): BAN 5753 or consent by instructor. Learn how to properly use various multivariate data analysis techniques including multiple regression, MANOVA, Discriminant analysis, Clustering, MDS and Conjoint Analysis. Students may not take both MKTG 6413 and BAN 5763 for degree credit.

**BAN 5900** Advanced Practicum in Business Analytics. Prerequisite(s): Consent of director of MS in Business Analytics and satisfactory completion of nine hours of BAN 5000- or MKTG 5000-level courses. Professional supervised experience in advanced business analytics projects for which the student assumes a degree of professional responsibility. Activities approved in advance by the instructor and must reflect advanced graduate level analysis. May consist of full or part-time business analytics 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 instructor.

**Business Communications (BCOM)**

**BCOM 3113** Written Communication. Prerequisite(s): 50 credit hours. Analysis of business communication problems in terms of generally accepted communication principles. Practice in neutral and positive, negative and persuasive written messages. Practice writing a short report, as well as preparation of employment documents. (Students may not take both BCOM 3113 and BCOM 3443 for degree credit).

**BCOM 3223** Oral Communication. Prerequisite(s): 50 Credit Hours. Prepares students for oral and written communication in the workplace. Emphasis on planning and presenting of ideas to audiences as an individual and as a member of a team. Grammar skills and principles of effective communication will be explored.

**BCOM 3333** Business Report Writing. Prerequisite(s): BCOM 3113 and 6 hours of English. An advanced written and oral business communication class which focuses on the fundamentals of writing and presenting business reports. The course will include coverage of mechanics, content, structure, and research of business reports as well as Power Point presentation.

**BCOM 3443** Business Communication for International Students. Prerequisite(s): 50 credit hours. Analysis of business communication problems in terms of generally accepted communication principles. Practice in written messages, employment documents and presentations. This course is specifically designed for students who learned English as a second language. (Students may not take both BCOM 3113 and BCOM 3443 for degree credit).

**BCOM 5113** Seminar in Administrative Communication. Understanding and application of valid and relevant communication principles and theories. Designed to develop management-level personnel who can effectively and efficiently use oral and written communications as administrative tools to organizational functioning.

**BCOM 5210** Business Communication Applications. 1-3 credits, max. 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 Honors (BHON)**

**BHON 4053** Critical Issues in Global Business. Prerequisite(s): Junior standing, admission to the Honors Program. Current critical issues facing business in a global environment. Social, political, economic, and technological sectors of the environment. Framework of study on geographical and political regions.

**BHON 4063** Topics in Contemporary Business. Prerequisite(s): 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. competition and business and environmental issues.

**BHON 4073** Literature in Business. Prerequisite(s): Junior standing, admission to the Honors Program. Foundations of American business through selected literary masterpieces.

**BHON 4990** Business Honors Thesis. 1-5 credits, max. 5. Prerequisite(s): Honors Program participation, senior standing, college approval. A guided research 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 college honors in business.

**Career and Technical Education (CTED)**

**CTED 2000** Field Experience. 1-6 credits, max. 6. 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.

**CTED 3000** Occupational Experience. 1-24 credits, max. 24. Credit to be determined by a special skill competency examination.

**CTED 3203** Foundations of Career and Technical Education. Opportunities provided by career and technical education through the programmatic areas of core industrial, business, marketing and information technology, health occupations, and technology education. The relationship of CTED to other elements of the educational system, including legislative aspects, student guidance, and programs for students with special needs.

**CTED 3903** Seminar in Professional Education. Procedures for completing certification and portfolio requirements and gaining admission to Professional Education and student teaching. Documentation of field experiences, professional development opportunities, and observations of at least 45 clock hours of master teachers in various school settings.

**CTED 4010** Career and Technical Education Workshop. 1-6 credits, max. 12. Professional workshops covering various topics and lengths. Focus on a particular topic from such areas as the development, use and evaluation of instructional methods and materials.

**CTED 4103** Instructional Procedures in Career and Technical Education. Methods and techniques for effective teaching and learning in career and technical classroom, laboratories, and technology-based environments.

**CTED 4110** Career and Technical Information. 1-6 credits, max. 12. New developments in scientific and technical information and knowledge that are
CHE 3123 Chemical Reaction Engineering. Prerequisite(s): 3333, 3473, and admission to CHE Professional School. Principles of chemical kinetics rate concepts and data treatment. Elements of reactor design principles for homogeneous systems; introduction to heterogeneous systems.


CHE 3473 Chemical Engineering Thermodynamics. Prerequisite(s): Admission to CHE Professional School. 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.

CHE 3581 Chemical Engineering Seminar 2. Prerequisite(s): Junior standing in the department. Thoroughly illuminated case studies and home assignments in the planning and operation for a CHE career and success in the CHE curriculum. Professional growth topics oriented to students in the junior-level CHE courses.

CHE 4002* Chemical Engineering Laboratory I. Lab 6. Prerequisite(s): 3013, 3333, 3473, admission to CHE Professional School. Application of CHE fundamentals and unit operation principles to the analysis of bench and pilot-scale equipment. Primarily fluid processing and heat exchange. Design of experiments on non-ideal units to generate credible data useful for validation of principles and for engineering decisions. Interpretation of experimental data and presentation of results.

CHE 4112* Chemical Engineering Laboratory II. Lab 6. Prerequisite(s): 3113, 3123, 4002, admission to CHE Professional School. A continuation of 4002. Primary reaction and mass transfer processes.

CHE 4124* Chemical Engineering Design I. Lab 2. Prerequisite(s): 3115, 3123, 4002, and admission to CHE Professional School. Economic analysis of process plants and systems of equipment; methods for estimating plant investment requirements and operating costs; economic evaluation and optimal design of chemical process systems; basic equipment and process design calculations.

CHE 4224* Chemical Engineering Design II. Lab 2. Prerequisite(s): 4214 and admission to CHE Professional School. A continuation of CHE 4124. Economic analysis of process plants and equipment. Design of chemical processing equipment and chemical plants. Application of computer techniques to chemical engineering design.

CHE 4283* Bioprocess Engineering. Prerequisite(s): Admission to CHE Professional School and 3123 (or instructor consent). Application of fundamental engineering principles to biochemical and biological processes. Introduction to cellular processes, fermentation technology, biological mass transfer and kinetics, bioreactor design and scale-up and downstream processing. 

CHE 4293 Biomedical Engineering. Prerequisite(s): ENSC 2213, 3233, MATH 2155. Introduction to engineering principles applied to biomedical applications. Biomaterials, drug delivery, artificial organs, transport in biological systems, tissue engineering and modeling of biological systems.


CHE 4523 Introduction to Colloid Processing. Prerequisite(s): MATH 2513 and CHEM 1515. The physics and chemistry governing the behavior of microscopic particles in dilute and concentrated suspensions. Interparticle interaction influence on viscosity, viscoelasticity, yield stress, and shear thinning. Practical application of colloid principles in industrial practice. No credit for students with credit in 5523.

CHE 4581* Chemical Engineering Seminar 3. Prerequisite(s): Senior standing in the department. Through guest lectures and home assignments, preparation and planning for a CHE 5073 career and success in the CHE curriculum. Professional growth topics oriented to students in the senior-level CHE courses.


CHE 4990 Special Problems. 1-5 credits, max. 5. Lab 3-15. Prerequisite(s): Senior standing. Training in independent work, study of relevant literature, and experimental investigation of an assigned problem.

CHE 5000* Master’s Thesis. 1-6 credits, max 6. Prerequisite(s): Approval of major professor. Methods used in research and thesis writing.

CHE 5030* Professional Practice. 2-6 credits, max 8. Prerequisite(s): 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.

CHE 5073* Tissue Engineering. Prerequisite(s): Graduate standing and permission of instructor. Tissue engineering (TE) and the material strategy for different tissue constructs in bone TE, liver TE, neural TE, intestine TE, etc. will be discussed in this course. Same as MSE 5073.

CHE 5110* Special Topics in Chemical Engineering. 2-3 credits, max 6, Lab 2-6. Prerequisite(s): Consent of instructor. Small group and individual projects in unit operations, unit procedures, 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.

CHE 5123* Advanced Chemical Reaction Engineering. Prerequisite(s): 4473. Advanced principles and applications of chemical kinetics in catalysis, heterogeneous systems, non-ideal reactions, polymerization, and biological reactions.

CHE 5213* Selected Diffusional 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, crystalization, drying, humidification and liquid extraction.

CHE 5233* Bioseparations. Prerequisite(s): BAE 3013 or CHE 3013. Study of separations important in food and biochemical engineering such as leaching, extraction, exchange, ion exchange, filtration, centrifugation, membrane separation, and chromatographic separations. Course available online only through AG*IDEA consortium.

CHE 5263* Advanced Biomaterials Science and Engineering. Prerequisite(s): Graduate standing or consent of instructor. Engineering issue that are implicit in understanding the interactions of living tissue and processed materials will be introduced. Emphasis is on identifying the processes in which cells interact with surfaces and particulate matter and the outcome of these interactions. Highlighted biological responses will include inflammation and coagulation. Also, materials issues related to drug delivery and tissue engineering will be discussed. (Same course as MAE 5003)

CHE 5273* Basic Physiology and Physiological System Analysis for Engineers. Prerequisite(s): Graduate standing or consent of instructor. The goals of this class are: 1) to introduce the basic physiology concepts used widely in biomedical engineering research; 2) to introduce and develop engineering concepts and approaches for quantitative analysis of physiological systems. Engineering principles will be applied to study mechanical properties of various tissue and organ systems under normal and diseased conditions. Knowledge obtained from this class can help engineers to apply engineering principles to the design and development of medical devices for disease treatments. (Same course as MAE 5013)

CHE 5283* Advanced Bioprocess Engineering. Prerequisite(s): Consent of instructor. Application of fundamental engineering principles to biochemical and biopharmaceutical processes. Introduction to cellular processes, fermentation technology, biological mass transfer and kinetics, bioreactor design and scale-up, and downstream processing. (Same course as BAE 5283)

CHE 5293* Advanced Biomedical Engineering. Prerequisite(s): Consent of instructor. Principles and engineering analysis of biomedical processes. Artificial organs, biomaterials, tissue engineering, transport in biological systems, and biomedical imaging and drug delivery systems. (Same course as MAE 5033*)

CHE 5343* Advanced Environmental Engineering. Prerequisite(s): Consent of instructor. Science and engineering principles to minimize the adverse effects of human activities on the environment. National and state regulations. Predictive movement and fate of chemicals in the geospheres. Multi-media pollution assessment, analysis, and control. Consideration of safety, health, and environment issues from a process standpoint. Special project required. Credit not allowed if CHE 4343 was taken.

CHE 5373* Process Simulation. Prerequisite(s): 5843 or concurrent enrollment or with professor’s consent. Computer-aided process synthesis, simulation, analysis and optimization. Systematic tools for developing and screening potential chemical process flow sheets. Use of commercial process simulators to aid in evaluating process designs. Practical problems will be used as examples and case studies.

CHE 5523* Colloid Processing. Prerequisite(s): Graduate standing in engineering, physics, or chemistry or consent of instructor. The physics and chemistry governing the behavior of microscopic particles in dilute and concentrated suspensions. Interparticle interaction influence on viscosity, viscoelasticity, yield stress and shear thinning. Practical application of colloid principles in industrial practice.


CHE 5703* Optimization Applications. Prerequisite(s): Graduate standing. A survey of various methods of unconstrained and constrained linear and non-linear optimization. Applications of these methodologies using hand-worked examples and available software packages. Intended for engineering and science students. (Same course as ECEN 5703, IEM 5023 & MAE 5703)

CHE 5733* Neural Networks. Prerequisite(s): Graduate standing. Introduction to mathematical analysis of networks and learning rules and on the application of neural networks to certain engineering problems, image and signal processing and control systems. (Same course as ECEN 5733 & MAE 5733)


CHE 5853* Advanced Process Control Laboratory. 2-3 credits, max 6, Lab 2-6. Prerequisite(s): Graduate standing and permission of instructor. Instrumentation systems and control strategies on pilot-scale chemical processes. Calibration, filtering, dynamic modeling, tuning, advanced control, and method evaluation. Students will learn industrial practices and cope with many non-idealities.

CHE 5853* Advanced Chemical Process Control. Prerequisite(s): 4843 or equivalent. General concepts and approaches of model-based control. Studies in the application of process-model-based control and model-predictive control on multivariable, nonlinear, nonstationary, noisy processes.

CHE 5873* Air Pollution Control Engineering. Causes, effects and control of air pollutant emission. (Satisfaction of GE requirement).

CHE 5900* Special Problems. 2-4 credits, max 9. Prerequisite(s): Consent of instructor. Individual report topics in chemical engineering involving operations, processes, equipment, experiments, literature search, theory, computer use or combinations of these.

CHE 6000* Doctoral Thesis. 2-15 credits, max 54. Prerequisite(s): Consent of major professor. The doctoral dissertation for the minimum of 2 semester credit hours to a maximum of 15 semester credit hours in each semester during which laboratory work is in process. Methods used in research and thesis writing. An original investigation of a problem in chemical engineering and its report in a dissertation.

CHE 6010* Chemical Engineering Seminar. 1-3 credits, max 3. Advanced research and development topics.

CHE 6223* Advanced Chemical Engineering Thermodynamics. Prerequisite(s): 5843. Phase equilibrium in multicomponent systems. Irreversible processes. Properties of fluids and the prediction of properties by statistical methods. Application of thermodynamics to unit operations.

CHE 6440* Advanced Topics in Chemical Engineering. 3-6 credits, max 9. Topics in chemical engineering unit operations in design. Advanced mathematical techniques in chemical engineering problems. May be repeated for credit if subject matter varies.

CHE 6703* Research Methods in Chemical Engineering. Prerequisite(s): MS or Ph.D. candidacy in chemical engineering or consent of instructor. Methods and skills required to successfully conduct chemical engineering research projects. Maintaining research records, experiment design, data validation, results presentation and research ethics.

Chemistry (CHEM)

CHEM 1014 (L,N) Chemistry in Civilization. Symbols, methods and contributions to society of the chemical sciences. Includes polymers, pollution, energy, consumer chemicals, drugs, nuclear science, and other topics. May not be used for degree credit with 1215 or 1314.

CHEM 1215 (L,N) General Chemistry. Lab 2. Prerequisite(s): MATH 0123 or high school equivalent. The beginning chemistry course recommended for students in the applied biological sciences. May not be used for degree credit with 1014 or 1314.

CHEM 1225 (L,N) General Chemistry. Lab 2. Prerequisite(s): A minimum grade of "C" in CHEM 1215 or CHEM 1314 or CHEM 1414. A continuation of general chemistry (1215), recommended for students in the applied biological sciences. May not be used for degree credit with CHEM 1515.

CHEM 1314 (L,N) General Chemistry. Lab 2. Prerequisite(s): MATH 1513 with grade of "C" or better or concurrent enrollment in a higher level math course, or an acceptable math placement score into Trigonometry (see placement okstate.edu). The beginning chemistry course recommended for students in basic biological sciences (including pre-medical science and pre-veterinary science), philosophy, social sciences and engineering. May not be used for degree credit with CHEM 1014, CHEM 1215 or CHEM 1414.

CHEM 1413 Inquiry-Based Chemistry. Lab 3. Prerequisite(s): PHYS 1313 recommended. Directed inquiry and hands on study of chemical reactions. Recommended for elementary education majors as model course to learn and teach science.

CHEM 1414 (L,N) General Chemistry for Engineers. Lab 2. Prerequisite(s): One year of high school chemistry and a "C" or higher in MATH 1513 or concurrent enrollment in a higher level math course. Survey course for engineers needing only one semester of chemistry. Thermodynamics, atomic structure, solid state, materials, equilibria, acids and bases, and
Lab 2. Prerequisite(s): a grade of “C” or better in CHEM 1314. A continuation of general chemistry. May not be used for degree credit with 1225.

CHEM 2113 Principles of Analytical Chemistry. Prerequisite(s): a grade of “C” or higher in CHEM 1515. Modern theories of solutions, separation techniques and methods of analysis.

CHEM 2122 Quantitative Analysis Laboratory. Lab 6. Prerequisite(s): 2113 or concurrent enrollment. Laboratory work related to material covered in CHEM 2113.

CHEM 2980 Current Topics for Chemical Professionals. 1-6 credits Prerequisite(s): Current enrollment in CHEM 1314 or higher Chemistry course. Current topics for pre-chemical professionals which may include, but are not limited to Chemistry and Energy, Environnment, Materials, Energy, What That Stuff?, and Teaching/Learning. The course is intended to provide interested undergraduates with a broader introduction to topics relevant to future trends in chemistry and chemically-related fields. Discussion will be directed by faculty members with expertise in the identified area.

CHEM 2990 Special Problems in Chemistry. 1-3 credits, max 3. Prerequisite(s): 1515 or concurrent enrollment and consent of instructor. Independent training in chemistry.

CHEM 3013 The Chemistry of Organic Compounds. Prerequisite(s): A minimum grade of “C” in CHEM 1225 or CHEM 1515. Terminal, one-semester non-majors course in organic chemistry and structure, covering the general principles of nomenclature, structures, bonding, methods of preparation, reactions and use of acrylic, cyclic, and aromatic compounds. May not be used for degree credit with 3053 or 3015.

CHEM 3015* The Chemistry of Organic Compounds. Lab 4. Prerequisite(s): A “C” or better in CHEM 1225 or 1414 or 1515. Terminal, one-semester non-majors course in organic chemistry covering the general principles of nomenclature, structures, bonding, methods of preparation, reactions and uses of acrylic, cyclic, and aromatic compounds. May not be used for degree credit with 3053 or 3112.

CHEM 3053 Organic Chemistry. Prerequisite(s): a “C” or higher in CHEM 1515. Hydrocarbons and their derivatives, including specific compounds of theoretical, biological or industrial importance. May not be used for degree credit with 3015.

CHEM 3112 Organic Chemistry Laboratory. Lab 6. Prerequisite(s): 3153 or concurrent enrollment. Laboratory exercises related to theoretical principles covered in CHEM 3053 and 3153. May not be used for degree credit with 3051.

CHEM 3153* Organic Chemistry. Prerequisite(s): A grade of “C” or higher in 3053. A continuation of 3053.

CHEM 3353 Descriptive Inorganic Chemistry. Prerequisite(s): A grade of “C” or higher in CHEM 1515. Structures and properties of the elements and their many compounds in the broadest sense which includes the modern technology of important materials, organometallics, and inorganic substances of biological significance.

CHEM 3413* Physical Chemistry Applications. Prerequisite(s): CHEM 2113 or concurrent enrollment, and MATH 2144 with a grade of “C” or better. A practical and applied approach to key topics in physical chemistry, including thermodynamics, chemical equilibria, and chemical kinetics, and how they relate to general chemical and biological processes on a molecular and macroscopic level.

CHEM 3433* Physical Chemistry I. Prerequisite(s): CHEM 2113 or concurrent enrollment and a “C” or higher in MATH 2163. Introductory theoretical analysis of molecular structure, chemical bonding and macroscopic chemical systems using quantum theory, classical and statistical thermodynamics, and kinetics. Students who are not chemistry majors may receive graduate credit.

CHEM 3532* Physico-Chemical Measurements. Lab 6. Prerequisite(s): a “C” or higher in CHEM 2212 and 3433. Apparatus, experimental methods, and calculations employed in physico-chemical investigations.

CHEM 3553* Physical Chemistry II. Prerequisite(s): a grade of “C” or higher in 3433. A continuation of 3433. Students who are not chemistry majors may receive graduate credit.

CHEM 4020* Modern Methods of Chemical Analysis. 1-5 credits, max 5. Prerequisite(s): a “C” or higher in 2122. Theoretical and laboratory study of modern techniques, reagents and instruments employed in analytical chemistry.

CHEM 4320* Chemical and Spectrometric Identification of Organic Compounds. 1-3 credits, max 3. Lab 1-2. Prerequisite(s): a “C” or higher in CHEM 3112 and 3153. Theory and practice in separating mixtures of organic compounds and some theory and practice in identifying organic compounds by spectrometric methods.

CHEM 4990* Special Problems. 1-5 credits, max 6. Lab 3-15. Prerequisite(s): Junior or senior standing and instructor permission. Training in independent work, study of relevant literature and experimental investigation of an assigned problem culminating in a written and oral report.

CHEM 5000* Thesis. 1-6 credits, max 6. Investigations, chiefly experimental, with necessary conferences. Familiarizes the student with methods used in research in chemistry.

CHEM 5001* Introduction to Chemistry Research. Prerequisite(s): Graduate student standing. Introduction to chemical research topics of interest to the department. Special emphasis placed on ethics, plagiarism, codes of conduct, research notebooks, publishing, and presentations.

CHEM 5011* Graduate Seminar. Preparation and presentation of seminars usually on subjects of current interest taken from the literature. Completion of 1 credit hour required for MS degree.

CHEM 5103* Physical and Chemical Separations. Prerequisite(s): One year of physical chemistry. Principles of bulk and multi-stage separation methods: chromatography, liquid-liquid extraction, and zone melting.

CHEM 5113* Equilibrium and Kinetics in Analytical Chemistry. Prerequisite(s): One year of physical chemistry. Physical and chemical principles of equilibrium and kinetics as applied to analytical problems.

CHEM 5220* Modern Topics for Teachers. 1-9 credits, max 9. Prerequisite(s): 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.

CHEM 5223* Chemistry of High Polymers. Prerequisite(s): 3153 and 3433 or equivalent. Preparation and polymerization of organic monomers; properties and uses of resulting high polymers; theories of polymerization; inorganic and natural organic polymers.

CHEM 5260* Inorganic Chemistry I. 1-3 credits, max 3. Prerequisite(s): 3353 or equivalent and 3 hours of physical chemistry. Bonding theory, molecular and ionic structures, crystal field theory, solution chemistry, and mechanisms of inorganic reactions in solution.

CHEM 5283* Solid-State Chemistry. Prerequisite(s): 5260. Structure, bonding, and properties of crystalline and amorphous inorganic solids. Emphasis on the chemical properties of inorganic solid-state compounds and phase transitions in inorganic solids.


CHEM 5373* Spectrometric Identification of Organic Compounds. Lab 3. Prerequisite(s): 4320. Lectures on ultraviolet, circular dichroism, infrared, nuclear magnetic resonance (NMR) and mass spectrometry (MS). More advanced techniques in NMR and MS stressed. Hands-on training and use of modern spectrometric instrumentation in laboratory.

CHEM 5443* Mechanism and Structure in Organic Chemistry. Prerequisite(s): 3153 and 3533. Relationship of properties of organic compounds to their structure; mechanisms of organic reactions.

CHEM 5563* Chemical Thermodynamics I. Prerequisite(s): 3553. Statistical and classical thermodynamics applied to chemical systems.

CHEM 5623* Quantum Chemistry I. Prerequisite(s): 3553. Fundamentals of quantum mechanics, including classical mechanics, wave representation of matter, the Schroedinger equation, and atomic structure.

CHEM 5960* Inorganic Chemistry II. 1-3 credits, max 3. Prerequisite(s): 5260. Chemistry of main group and transition metal organometallic compounds, metal clusters, and catalysis by organometallic polymers, bioinorganic chemistry, and materials chemistry. (Same course as 6650*).

CHEM 6000* Doctoral Dissertation Research. 1-15 credits, max 60. Prerequisite(s): MS degree in chemistry or consent of instructor. Independent investigation under the direction and supervision of a major professor.

CHEM 6101* Research Seminar. 1 credit, max 5. Prerequisite(s): Consent of instructor. Presentations of current research. One credit hour per academic year required for MS and PhD candidates.

CHEM 6011* Advanced Seminar. Prerequisite(s): 5011 or MS degree. Preparation and oral presentation of critical reviews on chemical subjects. Usually related to the student’s research area. Completion of one credit hour required for the PhD degree.

CHEM 6050* Special Topics in Analytical Chemistry. 1-6 credits, max 6. Supervised study of topics and fields not otherwise covered.

CHEM 6103* Electroanalytical Chemistry. Prerequisite(s): 4024. The theory, practice and instrumentation in various areas of modern electroanalytical chemistry.

CHEM 6113* Analytical Spectroscopy. Prerequisite(s): 4024. Survey of selected topics in analytical applications of spectrophotometric techniques. Fundamental concepts as well as current trends in research, including instrumentation.

CHEM 6223* Physical Polymer Science. Prerequisite(s): 5223 or equivalent. A study of the physical properties of macromolecular systems including polymer solutions, gels, bulk polymers and rubbers. The characterization of polymers based on their thermal, spectroscopic, microstructural and molecular masses is also discussed.

CHEM 6420* Special Topics in Organic Chemistry. 1-9 credits, max 9. Prerequisite(s): 3153. Deals with topics not covered in other courses.

CHEM 6453* Chemical Kinetics. Prerequisite(s): 3553. The kinetics of chemical reactions and their theoretical interpretation.

CHEM 6553* Molecular Spectroscopy. Prerequisite(s): 5623. Spectra and
structure of molecules.

CHEM 6650* Selected Topics in Advanced Physical and Inorganic Chemistry. 1-6 credits, max 12. Prerequisite(s): Consent of instructor. Supervised study of selected topics and fields not otherwise covered. (Same course as 5960*)

CHEM 6803* Photonics I: Advanced Optics. Lab 9. Prerequisite(s): ECEN 3813 or PHYS 3213, or consent of instructor. Advanced optics, including spectral and time characteristics of detectors, characteristics of lasers, time, spectral and spatial parameters of laser emission, interferometric techniques, and nonlinear effects such as two-photon absorption and second and third harmonic generations. Ultra short laser pulses. (Same course as ECEN 6803 & PHYS 6803)

CHEM 6810* Photonics II: THz Photonics and THz-TDS. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. THz photonics and THz time-domain spectroscopy (THz-TDS). Concepts and techniques of driving electronic circuitry with ultra short laser pulses to generate and detect freely propagating pulses of THz electromagnetic radiation using several operational research systems. (Same course as ECEN 6810 & PHYS 6810)

CHEM 6820* Photonics II: Spectroscopy II. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Operating principles and applications of laser spectroscopy of atoms, molecules, solids and complex fluids. Absorption, emission, photon correlation, coherence, time resolved Fourier transform. Raman spectroscopy and non-linear optical. (Same course as ECEN 6820 & PHYS 6820)

CHEM 6830* Photonics II: Spectroscopy III. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Advanced spectroscopic instruments and methods used for investigation of semi-conductors and solid state material. Stimulated emission characteristic both in wavelength and in time. Time-resolved fluorescence measurements. Multiphoton excitations. Fast measuring techniques, including subnanosecond detectors, picosecond streak cameras, and ultra fast four-wave mixing and correlation techniques. Time-dependent photocurrentivity measurements. (Same course as ECEN 6830 & PHYS 6830)

CHEM 6840* Photonics III: Microscopy I. 1 credit, max 4, Lab 1. Prerequisite(s): 3553 or consent of instructor. The structure and imaging of solid surfaces. Basics of scanning probe microscopy (SPM). Contact and noncontact atomic force microscopy (AFM). Scanning tunneling microscopy (STM) in air. (Same course as ECEN 6840 & PHYS 6840)

CHEM 6850* Photonics III: Microscopy II. 1 credit, max 4, Lab 1. Prerequisite(s): 3553 or consent of instructor. Advanced techniques of scanning probe microscopy (SPM). Magnetic force microscopy, Kelvin force microscopy, scanning tunneling microscopy (STM) in vacuum. Characterization of materials with SPM. Nanolithography and SPM. Device manufacturing and analysis. (Same course as ECEN 6850 & PHYS 6850)

CHEM 6860* Photonics III: Microscopy and Image Processing. 1 credit, max 4, Lab 1. Prerequisite(s): ECEN 5793. Digital image processing, including projects. Image acquisition and display, image enhancement, geometric operations, linear and nonlinear filtering, image restoration, edge detection, image analysis, morphology, segmentation, recognition, and coding/ compression. (Same course as ECEN 6860 & PHYS 6860)

CHEM 6870* Photonics IV: Synthesis and Devices I. 1 credit, max 4, Lab 1. Prerequisite(s): 6803 and 6840. Preparation of functional nanostructures and related optical and electronic devices. Physical and chemical methods of thin film deposition. Engineering of prototypes of light emitting diodes, sensors, optical limiting coatings, lithographic patterns. (Same course as ECEN 6870 & PHYS 6870)

CHEM 6880* Photonics IV: Semiconductor Devices, Testing and Characterization. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Test and characterization of semiconductor and optoelectronic devices. Hall Effect, four point probe, CV and IV measurements, optical pump-probe, photoluminescence and electro-optics sampling. (Same course as ECEN 6880 & PHYS 6880)

CHEM 6890* Photonics IV: Semiconductor Synthesis and Devices I. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Processing, fabrication and characterization of semiconductor optoelectronic devices in class 100/1000 clean rooms. Clean room operation, including general procedure for material processing and device fabrication. Device processing using a variety of processing such as mask aligner, vacuum evaporators and rapid thermal annealer. Testing using optical and electrical testing apparatus such as I-V, C-V, Hall and optical spectral measurement systems. (Same course as ECEN 6890 & PHYS 6890)

Chinese (CHIN)


CHIN 1225 Elementary Chinese II. Prerequisite(s): 1115 or equivalent proficiency. Continuation of 1115. Mastery of the basic grammatical patterns and conversational principles, and increasing repertory of Chinese characters. Not for native speakers per University Academic Regulation 4.9.

CHIN 2115 Intermediate Chinese I. Prerequisite(s): 1225 or equivalent proficiency. A continuation of 1225. Emphasis on fluency in spoken Mandarin Chinese, structures of greater complexity, a greater repertory of characters and vocabulary items, and reading ability. Not for native speakers per University Academic Regulation 4.9.

CHIN 2225 Intermediate Chinese II. Prerequisite(s): 2115 or equivalent proficiency. Continuation of 2115. Not for native speakers per University Academic Regulation 4.9.

CHIN 3013 Chinese Conversation. Prerequisite(s): 2225 or equivalent proficiency. Development of general oral and aural proficiency. Emphasis will be placed on understanding the impact of engineering solutions in a global and societal context. The various sub-disciplines within the fields of Civil and Environmental Engineering will also be presented.

CIV 3413 Structural Analysis. Prerequisite(s): Minimum grade of "C" in ECEN 3413. 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.

CIV 3513 Structural Steel Design. Prerequisite(s): Admission to CIVE professional school required and 3413, or department permission required. Introduction to the design of steel structures and connections in accordance with AISC specifications.

CIV 3523 Reinforced Concrete Design. Prerequisite(s): Admission to CIVE professional school required and 3413, or department permission required. Introduction to the design of reinforced concrete elements in accordance with the strength design requirements of the ACI Building Code.

CIV 3614 Engineering Surveying. Prerequisite(s): Minimum grade of "C" required in MATH 1613 or 1615. 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.

CIV 3623 Engineering Materials Laboratory. Prerequisite(s): Admission to CIVE professional school required and 3714 or concurrent enrollment, or department permission required. Basic construction material properties and use of various concrete, asphalt concrete, aggregate, 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.

CIV 3633 Transportation Engineering. Prerequisite(s): Admission to CIVE professional school required and 3614, or department permission required. 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.

CIV 3714 Introduction to Geotechnical Engineering. Prerequisite(s): Minimum grade of "C" in ENSC 2143, or department permission required. Physical and mechanical properties of soils, including grain size analysis, plasticity, permeability, consolidation, and shear strength. Use of physical and mechanical properties to calculate stresses in a soil mass, lateral earth pressures and bearing capacity. Laboratory tests conducted to determine the physical and mechanical soil properties needed for application in geotechnical design.

CIV 3813 Environmental Engineering Science. Prerequisite(s): CHEM 1414 or 1515, MATH 2144. Engineering aspects of the life support system; the carbon-oxygen cycle, cycling of nitrogen, sulfur and phosphorus; and the hydraulic 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.

CIV 3833 Applied Hydraulics. Prerequisite(s): Admission to CIVE professional school required and minimum grade of "C" in CHEM 1414 or 1515 and ENSC 3233 and PHYS 2043, or department permission required. Basic hydraulic principles and their application in civil engineering problems. Analyses of water distribution networks, open channels, storm-water management and...
wastewater collection systems, water pumps, hydraulic models, hydraulic measurements, treatment plant hydraulics and hydraulic structures.

CIVE 3843 Hydrology I. Prerequisite(s): Admission to CIVE professional school required and minimum grade of "C" in CHEN 1414 or 1515 and ENSC 3233 and PHYHS 2014, or department permission required. Basic hydraulic principles and their application in civil engineering problems. Analyses of water distribution networks, open channels, storm-water management and wastewater collection systems, water pumps, hydraulic models, hydraulic measurements, treatment plant hydraulics and hydraulic structures.

CIVE 3853 Environmental Engineering Laboratory. Prerequisite(s): Admission to CIVE professional school required and 3813, or department permission required. Performance of experiments with benchscale environmental engineering unit operations, review of chemical principles and analyses important to the evaluation of these and other environmental engineering applications. Emphasis on the development of experimental results that can be used in the design of full-scale units.

CIVE 4010* Civil Engineering Research. 1-4 credits, max. 12. Prerequisite(s): Senior standing or consent of instructor. Research and investigation of civil engineering problems.

CIVE 4041 Engineering Practice. Prerequisite(s): Admission to professional school required and enrolled in last two semesters of CIVE degree, or department permission required. Topics relevant to the professional practice of civil and environmental engineering will be introduced, to include management principles, project management, and the laws that impact the practice of engineering, such as OSHA and ADA. Emphasis will be placed on written communication skills to include resumes, letters of introduction, and job interviews. The advantages of professional registration and practical professional society membership will be presented as well as discussions of professional ethics, income taxes, and investments.

CIVE 4043 Senior Design. Prerequisite(s): Admission to CIVE professional school required and enrolled in last two semesters of CIVE degree and 3813, 3853, or department permission required. 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 decisions made. Economic, environmental, social, and regulatory aspects of environmental engineering design.

CIVE 4273 Construction Engineering and Project Management. Prerequisite(s): Admission to CIVE professional school required and graduate standing. Principles and practice of construction engineering and project management. Project planning, development of cost estimates and project schedules, construction methods and fundamental terminology used in the engineering and construction industry.

CIVE 4711 Basic Soils Testing Laboratory. Prerequisite(s): Non CIVE majors only, ARCH 4143 for ARCH students. Laboratory measurements of the physical and mechanical properties of soils; grain size distribution, plasticity, permeability, compaction, compressibility, and shear strength.

CIVE 4823* Human Impact on the Environment. The activities of humans and how they affect the aqueous, terrestrial, and atmospheric environment.

CIVE 4833 Unit Operations in Environmental Engineering. Prerequisite(s): Admission to CIVE professional school required and 3813 and ENSC 3233 or department permission required. Fundamental principles of water and wastewater treatment, including basic theory and development of design parameters. Application of these to the design of unit operations and processes in various treatment plants.

CIVE 5000* Master's Thesis or Report. 1-6 credits, max. 6. Prerequisite(s): 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.

CIVE 5010* Civil Engineering Seminar. 1-3 credits, max. 15. Prerequisite(s): Graduate standing and approval of major professor, or undergrad in professional school. Review of literature of major fields of civil engineering.

CIVE 5013* Aquatic Chemistry. Prerequisite(s): Graduate standing or admission to CIVE professional school required and CIVE 5813 or concurrent enrollment in CIVE 5110 or equivalent, or department permission required. Application of chemical principles to environmental problems. Chemical kinetics, chemical equilibrium, acid-base chemistry, development of pc-pH diagrams, and coordination chemistry. Precipitation and dissolution reactions and oxidation-reduction reactions.

CIVE 5020* Civil Engineering Research. 1-6 credits, max. 6. Prerequisite(s): Graduate standing and approval of major professor. Research and investigations other than thesis studies.

CIVE 5023* Public Health Engineering. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Protection of public health through improved environmental in urban, suburban, and rural communities. Practical examples, simple formulas, general rules and guidelines for application of public health principles. Intended for students in engineering, physical sciences and other technical disciplines.

CIVE 5030* Engineering Practice. 1-6 credits, max. 9. Prerequisite(s): Approval of adviser. Professional supervised civil engineering practice involving authentic projects for which the student assumes a degree of professional responsibility. Activities must be approved in advance by the student's adviser and may consist of engineering experience on-campus or off-campus, or both. Periodic reports, both oral and written, are required as specified by the adviser.

CIVE 5033* GIS Applications for Water Resources. Prerequisite(s): Graduate standing. Application of theoretical and practical components of geographic information system for engineers. Digital mapping of water resources information, spatial coordinate systems and digital terrain analysis using digital elevation models. Analysis of a variety of spatial data in efficient and effective manner. Introduction of geospatial analytical algorithms to solve civil and environmental problems.

CIVE 5043* Risk and Failure Analysis of Dams. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Course introduces students to effective ways of modeling construction processes and technologies. It provides an investigation of quantitative methods used for the design and analysis of construction projects to maximize productivity and minimize resource idleness. It includes discussions on queueing theory, line-of-balance techniques, linear programming and simulation. Comprehensive group projects that involve modeling and analyzing actual construction operations will be integral parts of this course.

CIVE 5113* Construction Business Management. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Fundamental theories and applied methods of financial management of construction companies. The spectrum of the present and future practice of business management at the construction company level. Basic construction business operations in the context of construction accounting, financial management, cash flow analysis, financial planning, and risk analysis.

CIVE 5123* The Legal and Regulatory Environment of Engineering. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Legal and regulatory environment of civil and environmental engineering. Analysis of laws and regulations in the field of civil engineering. Topics include tort law, labor law and labor having an impact on engineering and construction. Union organization and activities. Government contracting and the laws governing it. Discussions of the Occupational Safety and Health Act and Americans with Disabilities Act. In-Depth discussions on environmental and safety issues. Legal and regulatory environment of civil and environmental engineering, including NEPA, CWA, SDWA, RCRA, CERCLA and CAA Water law.


CIVE 5143* Project Engineering and Management. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Management of the design and construction of civil engineering projects. Topics include owner's study, formation of project teams, design coordination, construction, and project closeout.

CIVE 5153* Contract Administration. Prerequisite(s): Graduate standing or consent of instructor. Methods and techniques of tracking and control of construction projects. Evaluation of current research findings to contract instrumentation.

CIVE 5163* Construction Equipment Management. Prerequisite(s): Graduate standing or admission to CIVE professional school required. 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.

CIVE 5173* Concrete Formwork Design. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Design of formwork for concrete structures. Analysis of loads, deflections, and stresses of forming systems. Evaluation of economics of formwork designs.

CIVE 5183* Construction Estimating. Prerequisite(s): Graduate standing or admission to CIVE professional school required. The construction industry, its makeup, operation, estimating, and bidding procedures. Theory and practice of estimating materials, labor, equipment, and overhead costs for various types of construction. Emphasis on preliminary cost estimates during the conceptual design phase of a construction project.

226  Civil Engineering (CIVE)
CIVE 5203* Pavement Rehabilitation, Management and Safety. Prerequisite(s): Graduate standing or senior standing with instructor approval. Understand and perform pavement evaluations of function, structure, surface condition, and safety and learn various types of equipment for evaluation and design. Identify functional and structural condition and analyze. Describe techniques for rehabilitation of flexible and rigid pavements, and overall objectives and major components of a pavement management system. Understand and explain the basic techniques of safety analysis based on pavement surface data.

CIVE 5243* Use and Design of Geosynthetics. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3714. 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.

CIVE 5253* Sensors and their Applications for Pavement. Prerequisite(s): Graduate standing or senior standing with instructor approval. Sensor Principles of Falling Weight Deflectometer (FWD), Rolling Weight Deflectometer (RWD) and Trucker Speed Deflectometer (TSD); 2D and 3D laser imaging as used in pavement surface condition survey; Laser scanners and accelerometers for pavement longitudinal profile; Friction and texture measurement of pavement surface; New software and mobile tools for presenting sensor data with HTML5; 3D visualization and database management with pavement sensor data; Inertial navigation system and high-precision gyro for pavement data positioning; LIDAR and its usage for infrastructure management.

CIVE 5273* Concrete Durability. Prerequisite(s): CIVE 5673 Concrete Mixture Design and graduate standing or permission of instructor. This course investigates methods, test methods, and evaluation procedures, and the primary mechanisms for durability issues in concrete. Emphasis is placed on providing a practical and theoretical overview of the topics. Special topics may be covered with the interest of the students.

CIVE 5283* Numerical Methods in Geotechnical Engineering. Prerequisite(s): Graduate standing, or professional school and CIVE 3714 for undergraduate students. This course covers some fundamental principles of finite element method and its application to problems in geotechnical engineering. Students will use computer programs to perform analysis of geotechnical earth structures including flow through porous media, unsaturated and saturated soils.

CIVE 5303* Systems Analysis for Civil Engineers. Prerequisite(s): Graduate standing or admission to CIVE professional school required. Synthesis of systems modeling and simulation techniques, mathematical optimization procedures, and evaluation tools of multi-attributed systems including utility theory and risk analysis. Emphasis is placed on review of some fundamental principles of finite element method and its application to problems in geotechnical engineering. Students will use computer programs to perform analysis of geotechnical earth structures including flow through porous media, unsaturated and saturated soils.

CIVE 5313* Highway Traffic Operations. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3633. Level of service, capacity and service volume concepts. Operational characteristics of uninterrupted-flow and interrupted-flow traffic facilities. The 1985 HCM procedures for analyzing the capacity of freeways, multilane and two-lane rural highways, urban arteries, signalized and unsignalized intersection 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.

CIVE 5343* Urban Transportation Planning. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3633. Determinants of demand for transportation and models for demand forecasting. Performance characteristics of transportation systems and models for performance. Quantitative analysis of multimodal transportation networks including prediction of flow patterns and service quality. Evaluation of social, environmental, and political impacts of transportation decisions. Application of systems analysis techniques to the generation, evaluation, and selection of alternative transportation systems.

CIVE 5363* Design and Planning of Airports. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3633. Nature of civil aviation. Aircraft characteristics and performance related to airport planning and design. Air traffic control and navigation systems. Basic principles of airport planning and airport demand forecasting. Analysis of airport capacity and delays. Runway length requirements. Configuration and geometric design of runways, taxiways, holding aprons, and landing areas. Airport lighting, marking, and signing. Drainage and noise control.

CIVE 5373* Design of Traffic Control Systems. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3633. Traffic control devices and available technology, traffic control diagrams, and logical system needs. Design of vehicle detectors, controllers, communications links, signal display hardware, and wiring. Development of timing plans using computer simulation models. Freeway surveillance and control: ramp metering, incident detection, and management information systems. Preparation of contractual documents and construction supervision.

CIVE 5383* Geometric Design of Highways. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3633. Geometric, functional, and aesthetic aspects of roadway design. Alignment, sight distance, at-grade intersections, interchanges, and freeway systems. Design tools and techniques.

CIVE 5403* Advanced Strength of Materials. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3413. 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.

CIVE 5413* Classical and Matrix Methods of Structural Analysis. Prerequisite(s): Graduate standing or admission to CIVE professional school, and 3413. Advanced analysis of determinate frames, trusses and arches by classical, numerical, energy, and stiffness methods. Emphasis on methods for hand computations and development of matrix analysis.


CIVE 5433* Energy Methods in Applied Mechanics. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3413 and MATH 2233 or MAE 3323. Advanced structural mechanics from the standpoint of virtual work; energy principles and variational calculus applied to the analysis of structures, mechanisms, dynamics, and vibrations.

CIVE 5473* Steel Plastic Design. Prerequisite(s): Graduate standing or CIVE 3413 Structural Analysis and instructor approval. This course is for incoming graduate students that are not familiar with LRFD AISC based steel design. Topics typically covered in the undergraduate course are covered with additional topics.

CIVE 5503* Computer-Aided Structural Analysis and Design. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3413, 3513, 3523 (or concurrent enrollment) or permission of instructor. Major comprehensive design experience. Promotion of a design office atmosphere in using a team approach. Industry practitioners provide design projects and critique results. Analysis and design of complex structures and preparation of contract documents and drawings. Emphasis on modern computer-based computation and presentation tools.

CIVE 5513* Advanced Reinforced Concrete Design. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3523. Advanced topics in reinforced concrete design with emphasis on frames, slabs, and earthquake-resistant structures.

CIVE 5523* Advanced Steel Structure Design. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3523. Design of simple and complex prestressed concrete beams. Behavior under overload. Calculation of prestress losses and deflections.

CIVE 5533* Prestressed Concrete. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3523. Design of simple and composite prestressed concrete beams. Behavior under overload. Calculation of prestress losses and deflections.

CIVE 5563* Structural Dynamics. Prerequisite(s): Graduate standing or admission to CIVE professional school required and ENSC 2123 and CIVE 3413. Analysis of linear, elastic damped and undamped systems with single and multiple degrees of freedom using free and forced vibration. Lumped and distributed mass systems. Computational techniques to numerically integrate the equations of motion.

CIVE 5573* Timber Design. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3523 or 3531. Design of structural timber members, assemblies, and connections in accordance with ANSI/A&PA, NDS specifications. Design, build, and test timber structure.

CIVE 5653* Asphalt Materials and Mix Design. Prerequisite(s): 3623 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.

CIVE 5673* Concrete Materials and Mix Design. Prerequisite(s): 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.

CIVE 5693* Pavement Design and Analysis. Prerequisite(s): 3633 or consent of instructor. Principles of pavement design, including stress analyses, load and environmental effects, and material characteristics. AASHTO, PCA and RA methods of pavement design. Computer methods. Practical aspects of life cycle cost analyses and construction methods.

CIVE 5713* Soil Mechanics. Prerequisite(s): 3713 and 4711. Application of soil mechanics principles and concepts in geotechnical areas of permeability and fluid flow, subsidence, settlement analysis, bearing capacity, lateral earth pressures and retaining walls, slope stability, and metastable soils.

CIVE 5723* Foundation Engineering. Prerequisite(s): 3713 and 4711. Types of Oklahoma State University

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structural foundations including footings, mats, rafts, piles and drilled shafts. Site characteristics, 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.

CIVE 5733 * Rock Mechanics in Engineering Design and Construction. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 4833 or permission of instructor. Theory, design, and operation of water treatment plants. Sizing of various unit processes and presentation of CIVE professional school requirements.

CIVE 5953 * Biological Waste Treatment. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 4833 or permission of instructor. Fundamentals of microbial systems applied to waste treatment processes. Standard suspended-growth and fixed biofilm wastewater and sludge suspensions and treatment system design calculations.

CIVE 5963 * Open Channel Flow. Prerequisite(s): Graduate standing or admission to CIVE professional school required and 3833 or permission of instructor. Open channel hydraulics, energy and momentum concepts, resistance, channel controls and transitions, flow routing, and sediment transport.

CIVE 5983 * Groundwater Pollution Control. Prerequisite(s): Graduate standing or admission to CIVE professional school required or permission of instructor. Theory, design and operation of groundwater pollution control systems. Includes examples from site specific applications as well as regional or national focus.

CIVE 5993 * Environmental Data Analysis and Modeling. Prerequisite(s): Graduate standing or admission to CIVE professional school required or permission of instructor. Theory, design and operation of groundwater pollution control systems. Includes examples from site specific applications as well as regional or national focus.

ECON 2243 Business Economics. Prerequisite(s): 228. An introductory survey of microeconomics and macroeconomics, their interrelationships, and the business cycle. The resource allocation processes, the price system, and the goals of economic development in our economy. The analysis of economic growth and change. The theory and practice of economic development. Theories of economic growth, the business cycle, and international trade. Includes examples from site specific applications as well as regional or national focus.
CDIS 2033 Sign Languages. Introduction to methods of sign language currently used among the U.S. deaf society, socially and educationally, including traditional American Sign Language (ASL), Manually Coded English (MCE, SEE), and fingerspelling. Linguistic components of sign and various sociological, psychological and adaptive communication issues having an impact on the deaf community. Two hours per week devoted to lecture and theory; one hour involved in a variety of interactive sign language skill work in smaller groups.

CDIS 3123 Audiology and Audiology. Prerequisite(s): A grade of "C" or higher in 4213. Anatomy and physiology of the hearing mechanism and related physics of sound. Common etiologies of hearing disorders. Establishing hearing screening programs. Practical experience in pure tone audiometry and impedance screening.

CDIS 3213 Introduction to Communication Disorders. The normal development of speech, language and hearing. The characteristics, diagnosis and treatment of speech, language and hearing disorders among all age groups. Suggestions for related professions involved with people with communication disorders.


CDIS 3313 Phonetics. The analysis and description of speech at the segmental and suprasegmental levels. Development of students’ perceptual and analytical skills in speech sound production. Practice using the International Phonetic Alphabet for broad and narrow transcription. Overview of the speech production mechanism and process.

CDIS 4313 Introduction to Research. Prerequisite(s): A grade of "C" or higher in CDIS 3213, 3223, 3313, and 4213 and STAT 2013 or 2053. Introduction to research process and evidence based practice in communication disorders, including how to locate and evaluate research articles, how to find possible research topics, issues related to conduction of experiment, and how to determine treatment effectiveness.

CDIS 4101 Clinic Practicum. 1-3 credits, max 3. Lab 2-6. Prerequisite(s): 4022, 4031, 4323 or 4413, senior standing, 3.25 GPA in the major and consent of adviser. Supervised clinical practicum in speech-language pathology and audiology.

CDIS 4013 Diagnostics. Prerequisite(s): A grade of "C" or higher in CDIS 3213 and 3223. This course addresses principles and methods of assessment and diagnostics for people with communication disorders. The course includes test construction and design, reliability, validity, and other issues related to criterion and norm-referenced testing. Issues regarding diagnostic criteria and classification systems of communication disorders are also addressed.

CDIS 4023 Clinical Methods and Issues. Lab 2. Prerequisite(s): A grade of "C" or higher in CDIS 3213, 3223, and 3313. Acceptance into pre-professional program via Declaration of Intent in CDIS. Fundamental process and procedures of clinical practicum, report writing, goal selection; production, assessment and recording of speech and language behavior; development of interpersonal skills with clients, families, and other professionals; problem solving skills; professional organization and credentialing requirements and includes two hours per week of supervised clinical practicum.

CDIS 4113 Communication Disorders in Children. Prerequisite(s): A grade of "C" or higher in 3213 and 3223. This course will address a broad range of communication disorders in children. In compliance with the standards put forth by the American Speech-Language-Hearing Association, this course will cover the nature of speech, language, and communication disorders and differences in children, including the etiologies, characteristics, psychological, developmental, linguistic, and cultural correlates.

CDIS 4133 Aural Rehabilitation. Prerequisite(s): A grade of "C" or higher in 3123 and 4213. Clinical aspects of habilitation and rehabilitation programs for the deaf and the hard-of-hearing, including speech reading, auditory training, speech conservation, speech and language therapy, hearing aid orientation, and counseling. Study of amplification units including assistive listening devices.

CDIS 4213 Anatomy and Physiology of the Speech Mechanism. Prerequisite(s): A grade of "C" or higher in BIOL 1114. Structure and function of the respiratory, phonatory, articularatory, and neural systems involved in the oral communication processes.

CDIS 4253 Diagnostic Procedures in Communication Disorders. Prerequisite(s): 3224. Speech and language diagnostic testing and procedures, interpreting diagnostic information and deriving appropriate treatment goals.

CDIS 4313* Speech Science. Prerequisite(s): Acceptance into CDIS program and a grade of "C" or better in 3313, 4213 and PHYH 1014. Scientific bases of the acoustic parameters, the perceptual and productive processes of speech, and the interrelationships of those factors during speech communication.

CDIS 4423 Neural Bases of Speech and Language. Prerequisite(s): A grade of "C" or higher in 4213. Neuroanatomy and neuro-physiological processes related to speech and language. Including basic anatomy of the central and peripheral nervous systems and the physiological processes involved in neuromotor control and neuronal function related specifically to speech and language.

CDIS 4433 Communication Disorders in Adults. Prerequisite(s): A grade of "C" or higher in 4213 and 4423. A review of language disorders and changes occurring with both normal aging and common neurological diseases and traumas, with focus on cerebral vascular accidents. Neurophysiological bases and etiology are presented as well as evaluation and treatment of aphasia and right hemisphere disorders, dementia and traumatic brain injury.

CDIS 4900 Undergraduate Research. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Research in speech, language, and hearing sciences and disorders.

CDIS 4980 Independent Study in CDIS. 1-3 credits, max 9. Prerequisite(s): Junior standing and consent of instructor. Directed readings or research in communication sciences and disorders.

CDIS 4993 Senior Honors Thesis. Prerequisite(s): Departmental invitation, senior standing, Honors Program participation. A guided reading and research program ending with an honors thesis under the direction of a faculty member. Required for graduation with departmental honors in communication sciences and disorders.

CDIS 5000 Master's Research and Thesis. 1-3 credits, max 6. Prerequisite(s): Consent of graduate faculty. Research in speech, language and hearing sciences and disorders.

CDIS 5013 Research Methods in Communication Disorders. Prerequisite(s): A grade of "C" or higher in STAT 2013 or 2053. Disorders. Research methods with emphasis on methods used most frequently in communication sciences and disorders; experience devising, evaluating, and implementing research.


CDIS 5143* Phonological Disorders. Prerequisite(s): A grade of "C" or higher in 3313. Current issues in linguistic theories related to the assessment and treatment of phonological disorders in children. Critical analysis of current research.

CDIS 5153* Neurological Communication Disorders. Prerequisite(s): A grade of "B" or higher in 4213 and 4423 or consent of instructor. Communication disorders occurring with aging and common neurological diseases and trauma. Neurophysiological bases and etiology. Evaluation and treatment of aphasia and right hemisphere disorders.

CDIS 5163* Dysphagia. Prerequisite(s): A grade of "B" or higher in 4213 and 4423 or consent of instructor. Anatomy and neurophysiology of the swallowing mechanism in relation to pediatric and adult dysphagia. Evaluation, diagnosis and treatment of swallowing problems in children and adults including videofluoroscopic training with case studies. The first two-thirds of the course focus on adult dysphagia and the latter one third on pediatric dysphagia.


CDIS 5193* Motor Speech Disorders. Prerequisite(s): A grade of "B" or higher in 4213 and 4423 or consent of instructor. Nature, evaluation and treatment of neuromotionally-based motor speech disorders such as dysarthria and apraxia.

CDIS 5210* Advanced Practicum. 1-6 credits, max 15. Prerequisite(s): Graduate standing in the Department of Communication Sciences and Disorders, and consent of instructor. Practical experience for the advanced student on or off campus.

CDIS 5243* Language Disorders in School-Age and Adolescence. Prerequisite(s): A grade of "C" or higher in 4023 and 5113. Nature of spoken and written language disorders in school-age children and adolescents. Impact of language disorders on academic achievement. Assessment and intervention strategies.

CDIS 5333* Voice Disorders. Prerequisite(s): A grade of "B" or higher in 4313, 4213 and 4423 or consent of instructor. 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.

CDIS 5423* Augmentative/Alternative Communication. Prerequisite(s): Major in CDIS or consent of instructor. Evaluation and management of communication disorders in individuals requiring specially adapted educational interventions and communication technology programs. Adaptation of communication technologies.

CDIS 5433* Cleft Palate. Prerequisite(s): A grade of "B" or higher in 4213 and 4313 or consent of instructor. Recent research in the etiology, assessment and management of communicative disorders in individuals with cleft palate.

CDIS 5710* Special Topics in Communication Disorders. 1-4 credits, max 9. Prerequisite(s): Consent of instructor. Individual and group investigations of problems in communication sciences and disorders.

CDIS 5713* Fluency Disorders. Prerequisite(s): Graduate admission or
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CS 1003 Computer Proficiency. For students with minimal personal computer skills. Use of Internet and productivity software such as word processing, spreadsheets, databases, and presentation software. The ability to log on to a personal computer, access the OSU network, and access OSU websites is assumed.

CS 1013 Computer Science Principles. Computing as a creative human activity, abstraction to reduce detail and focus on concepts relevant to understanding and solving problems, describing data and information to facilitate the creation of knowledge. Discuss algorithms as tools for developing and expressing solutions to computational problems, use programming is a creative process that produces computational artifacts; and discuss digital devices, systems, and the networks that interconnect them.


CS 1113 (A) Computer Science I. Lab 2. Prerequisite(s): MATH 1513 or higher, with a grade of "C" or better. Introduction to computer science using a block-structured high-level computer language, including subprograms, arrays, recursion, records, and abstract data types. Principles of problem solving, debugging, documentation, and good programming practice. Elementary methods of sorting and searching. Use of operating system commands and utilities.

CS 2133 Computer Science II. Prerequisite(s): CS 1113 with a grade of "C" or better. Recursive algorithms. Intermediate methods of searching and sorting. Mathematical analysis of space and time complexity, worst case, and average case performance.

CS 2351 UNIX Programming. Lab 2. Prerequisite(s): CS 1113 or EEE 2303 with a grade of "C" or better. The UNIX programming system. The programming environment. The UNIX file system and the shell. Use of pipes and filters.

CS 2433 C/C++ Programming. Prerequisite(s): CS 1113 with a grade of "C" or better. C/C++ programming language types, operators, expressions, control flow, functions, structures, pointers, and the UNIX interface. An object oriented programming using C++ and the related language syntax and functionality.

CS 2570 Special Problems in Computer Science. 1-3 credits, max 6. Prerequisite(s): Consent of instructor and freshman or sophomore standing. Current topics and applications of computer science. Existing and new topics to computer science. Allows lower-division students to study topics not provided in existing classes. Can be individual study or a class with a new subject.

CS 3030 Industrial Practice in Computer Science. 1-6 credits, max 9. CS 3443 and MATH 2144, each with a grade of "C" or better, junior standing, consent of departmental adviser. Applied computing in industry. Topics vary with cooperating employers. Written reports will be specified by adviser. Basic object oriented programming using C++ and the related language syntax and functionality.

CS 3363 Organization of Programming Languages. Prerequisite(s): CS 2133 and MATH 3443 with a grade of "C" or better. Programming language constructs. Run time behavior of programs. Language definition structure. Control structures and data flow programming paradigms.

CS 3443 Computer Systems. Prerequisite(s): CS 2133 with a grade of "C" or better. 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.

CS 3513 Numerical Methods for Digital Computers. Prerequisite(s): MATH 2153 with a grade of "C" or better; MATH 3013 with a grade of "C" or better, or consent enrollment; or MATH 3263 with a grade of "C" or better and knowledge of programming. Errors, floating point numbers and operations, interpolation and approximation, solution of nonlinear equations and linear systems, condition and stability, acceleration methods, numerical differentiation and integration.

CS 3570 Special Problems in Computer Science. 1-6 credits, max 6. Prerequisite(s): Junior standing and consent of instructor. Current topics and applications of computer science. Existing and new topics to computer science. Allows lower-division students to study topics not provided in existing classes. Can be individual study or a class with a new subject.


CS 3653 Discrete Mathematics for Computer Science. Prerequisite(s): MATH 2144 with a grade of "C" or better. Theory and applications of discrete mathematical models fundamental to analysis of problems in computer science. Set theory, formal logic and proof techniques, relations and functions, combinatorics and probability, undirected and directed graphs, Boolean algebra, switching logic.

CS 4143 Computer Graphics. Prerequisite(s): MATH 2163 with a grade of "C" or better and prior programming experience. Interactive graphics programming; graphics hardware; geometrical transformation; data structures for graphic representations; viewing in three dimensions; representation of 3D shapes; hidden surface removal; ray tracing; shading models.

CS 4153 Mobile Applications Development. Prerequisite(s): CS 2133 or 2433, each with a grade of "C" or better. The history of mobile apps and their implication on computing in general. Survey of the various platforms and approaches used for mobile apps. Examine the differences between "consumer" programs and mobile apps. Learn tools and techniques to develop mobile apps, and demonstrate proficiency through development assignments.

CS 4173 Video Game Development. Prerequisite(s): CS 2133, and CS 2433 and MATH 2144, all with a grade of "C" or better. History of video games. A broad view of various game platforms: Computer graphics, audio tools and techniques, and artificial intelligence for game development. Game engines. Game development tools and techniques. An overview of the video game industry from a development perspective.

CS 4183 Video Game Design. Prerequisite(s): CS 2133 and 3653, each with a grade of "C" or better. Theory and pragmatics of game design including game mechanics, storytelling, and types of game play. The relationship between human/computer interaction and the user experience. A survey of game genres. An overview of the video game industry from a design perspective.

CS 4243 Algorithms and Processes in Computer Security. Prerequisite(s): CS 3443 with a grade of "C" or better. Overview of the components of computer and network security. Discussion of external processes required in secure systems, information assurance, backup, business resumption. Detailed analysis of security encryption, protocols, hashing, certification, and authentication. No credit for students with credit in CS 3243.

CS 4273 Software Engineering. Prerequisite(s): CS 2133, CS 3653, and (CS 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 environmental design. (Same course as ECEN 4273).

CS 4283 Computer Networks. Prerequisite(s): CS 2133 with a grade of "C" or better; and CS 3443 or ECEN 3213 with a grade of "C" or better; UNIX knowledge. Computer networks, distributed systems and their systematic design. Introduction to the use, structure, and architecture of computer networks. Networking experiments to describe network topology. ISO reference model. (Same course as ECEN 4283).

CS 4323 Design and Implementation of Operating Systems I. Prerequisite(s): CS 2133, CS 3443 or ECEN 3213; and CS 3653 and CS 4343 all with the grade of "C" or better. Process activation and process context block. Batch, multi-programmed, and timeshared operating system. Process management, memory management, and synchronization primitives. Deadlock prevention, avoidance, and detection.

CS 4343 Data Structures and Algorithm Analysis I. Prerequisite(s): CS 2133 and CS 3653, each with a grade of "C" or better. Storage, structures, data and information structures, list processing, trees and tree processing, graphs and graph processing, searching, and sorting.

CS 4433 Introduction to Database Systems. Prerequisite(s): CS 2133 with a grade of "C" or better. An overview of database management systems, entity-relationship model, relational model, structural query language, relational algebra, and procedural database operations with normalization theory and SQL, basic file organization and storage management; elementary e-commerce web application development; database systems and the Internet.

CS 4513 Numerical Mathematics: Analysis. Prerequisite(s): MATH 2233 and MATH 3013, each with a grade of "C" or better, knowledge of programming or equivalent instructor. Machine computing, algorithms, and analysis of errors applied to interpolation and approximation of functions solving equations and systems of equations; discrete variable methods for integrals and differential equations. (Same course as MATH 4513).

CS 4570 Special Topics in Computing. 1-3 credits, max 5. Prerequisite(s): Senior standing and consent of instructor. Advanced topics and applications.
of computer science. Typical topics include operating systems, multiprocessor systems, programming systems or various mathematical and statistical packages. Designed to allow students to study topics not provided in existing courses.

**CS 4793** Artificial Intelligence I. Prerequisite(s): CS 2133 and CS 3653, each with a grade of "C" or better. Breadth coverage of artificial intelligence (AI) topics, including search-oriented problem solving, knowledge representation, logical inference, AI languages, history and philosophy of AI.

**CS 4883** Social Issues in Computing. Prerequisite(s): Senior standing and ENGL 3323 or BCM 3113 or BCM 3223 with a grade of "C" or better. The history and evolution of computing systems, providing the background for the analysis of the social impact of computers. The social implications of computer use and or misuse with emphasis on the effects on the individual, society, and other human institutions. Social responsibilities of people involved in using or applying computers.

**CS 4993** Senior Honors Project. Prerequisite(s): Departmental invitation, senior standing, Honors Program participation. A guided reading and research program ending with an honors project under the direction of a faculty member, with a second faculty reader and an oral examination. Required for graduation with departmental honors in computing and information science.

**CS 5000** Master's Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of major professor, for a master's degree who elects to write a thesis or a report must enroll in this course.

**CS 5030** Professional Practice. 1-9 credits, max 9. Prerequisite(s): Graduate standing in computer science, consent of the department head. Experience in the application of computer science principles to problems encountered in industry or government; participation in projects. 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.*

**CS 5033** Parallel Algorithms and Programming. Prerequisite(s): CS 4343 with a grade of "C" or better, or consent of instructor. Models of parallel computer hardware; design and analysis of parallel algorithms; fundamental parallel algorithms for selected sorting, arithmetic, and matrix, and graph problems, and applications in science and engineering, message-passing programming, and shared-memory programming.

**CS 5070** Seminar and Special Problems. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Designed to allow students to study advanced topics not provided in existing courses.

**CS 5113** Computer Organization and Architecture. Prerequisite(s): CS 3443 and 4343, each with a grade of "C" or better. Computer architecture, computer control, microprogrammed control, addressing structures, memory hierarchies, hardware description languages, specific architectures, hardware simulation, and emulation.

**CS 5123** Distributed Systems. Prerequisite(s): CS 4473 and 4433. Distributed system architectures, models, design principles, and performance evaluation metrics. Distributed programming paradigms and service-oriented architectures. Design and analysis of distributed algorithms, Grid computing, cloud computing, peer-to-peer computing, and data-intensive computing paradigms. Programming multicores and manycore systems.

**CS 5173** Video Game Production. Prerequisite(s): CS 4173 and 4183, each with a grade of "C" or better. The various aspects of video game production and the video game industry will be covered, including technical production and testing, roles and responsibilities of team members, project management, and legal concerns related to video game production. Professionals from the video game industry will be invited to make presentations.

**CS 5243** Algorithms and Processes in Computer Security. Prerequisite(s): CS 3443 with a grade of "C" or better. Overview of the components of computer and network security. Discussion of external processes required in secure systems, information assurance, backup, business resumption. Detailed analysis of security encryption, protocols, hashing, certification, and authentication. No credit for students who have taken CS 4243.

**CS 5253** Digital Computer Design. Prerequisite(s): ECEN 3223 with a grade of "C" or better. 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 and management; input/output interfaces. (Same course as ECEN 5253)

**CS 5263** Quantum Computing. Prerequisite(s): Graduate standing. The main theory of quantum information science and its applications to communications, computing and cryptography. Topics include introduction to quantum mechanics, quantum gates, circuits, entropy, cryptographic schemes, and implementations. Current research trends in quantum computing. Model checking and model-based software reuse. Component-based software engineering and software repositories. (Same course as ECEN 5273)

**CS 5283** Computer Network Programming. Prerequisite(s): CS 4283 with a grade of "C" or better. Detailed technical concepts related to Internet and multimedia, high speed LANs, high speed transport protocols, MPLS, multicasting, Int. serv/Diff serv, Router Buffer management, self-similar traffic, and socket programming.

**CS 5313** Formal Language Theory. Prerequisite(s): CS 3613 with a grade of "C" or better. Formal language theory applied to procedure oriented languages. Application of finite state algorithms to lexical analysis. Chomsky hierarchy of languages. Generation, recognition, and closure properties of languages.

**CS 5323** Design and Implementation of Operating Systems II. Prerequisite(s): CS 4323 with a grade of "C" or better. Task systems and concurrent programming, synchronization, and inter process communication. Theoretical investigation of resource sharing and deadlock, memory management, strategies, and scheduling algorithms, queuing theory, distributed operating systems. Synthesis of operating systems. System management, strategies, and scheduling algorithms, queuing theory, distributed operating systems. Synthesis of operating systems.

**CS 5363** Advanced Organizations of Programming Languages. Prerequisite(s): CS 3363 with a grade of "C" or better. Continuation of 3363, mathematical theory of computer language organization functional programming. Parallelism in languages. Mathematics of control structures and data structures. Applications in programming languages. Syntax and semantics of languages. Design of interpreters, compilers, and run-time systems. Effective use of Graphical User Interfaces (GUIs), the Internet, data interchanging principles and related topics. *No credit for students with credit in 3373.* (Same course as 3373)

**CS 5413** Data Structures and Algorithm Analysis II. Prerequisite(s): CS 3443 with a grade of "C" or better. Data structures and their application in recursive and iterative algorithms. Static and dynamic data structure representations and processing algorithms. Dynamic and virtual storage management.

**CS 5423** Principles of Database Systems. Prerequisite(s): CS 4433 and 4434, each with a grade of "C" or better. Task: An overview of database management systems, entity-relationship model, relational model, structural query language, relational algebra, relational database design with normalization theorems, database integrity constraints, and principles of database systems with the Internet.

**CS 5433** Distributed Database Systems. Prerequisite(s): CS 5423 or CS 5283, with a grade of "C" or better. Distributed DBMS design and architecture, distributed query processing, transaction management, distributed concurrency control, data storage and processing for big data, Map-Reduce model for big data processing within the Hadoop software framework, big data warehouse for summarization, query and analysis using Hive, NoSQL databases, NoSQL database querying.

**CS 5513** Numerical Computation. Prerequisite(s): MATH 2233 with a grade of "C" or better; MATH 3013 or MATH 3263 or equivalent courses with a grade of "C" or better; CS 3513 or MATH 4513 or equivalent course with a grade of "C" or better; a knowledge of computer programming. Errors in machine computation; condition of problems and stability of algorithms; interpolation and approximation; non-linear equations; linear and nonlinear systems; differentiation and integration; applications to modeling, simulation, and/or optimization.

**CS 5653** Automata and Finite State Machines. Prerequisite(s): CS 5313 with a grade of "C" or better. Sequential machines and automata. Hierarchy of recognizers. Decision problems and closure properties. Finite and infinite state machines. Cellular and stochastic automata. Coverings of automata.

**CS 5663** Computability and Decidability. Prerequisite(s): CS 5313 with a grade of "C" or better. Primitive recursive functions. Equivalence of models of computation. The Halting problem and undecidability. Reducing one problem to another or representation change. Tractability and the P-NP problem. Complexity hierarchies.

**CS 5793** Artificial Intelligence II. Prerequisite(s): CS 4793 with a grade of "C" or better. Advanced topics in artificial intelligence; grid computing, cloud computing, peer-to-peer computing, and data-intensive computing paradigms. Programming multicores and manycore systems.

**CS 5813** Principles of Wireless Networks. Prerequisite(s): CS 4283 or ECEN 4283, with a grade of "C" or better. Wireless network operation, planning, mobility management, cellular and mobile data networks based on CDMA, TDMA, GSM, IEEE 802-11 WLANS, Adhoc networks, Bluetooth, power management, wireless geolocation and indoor positioning techniques. (Same course as ECEN 5563)

**CS 5823** Network Algorithmics. Prerequisite(s): CS 4283 and 4233, each with a grade of "C" or better. Discusses principles and methodologies in network implementation-router architecture, end node architecture, data copying, timer maintenance, demultiplexing, forwarding table, lookups, switching, scheduling, IP traceback.

**CS 6000** Doctoral Dissertation. 2-15 credits, max 40. Prerequisite(s): Graduate standing and approval of advisory committee. Independent research under the direction of a member of the graduate faculty. For students working toward a PhD degree.

**CS 6210** Advanced Topics in Parallel and Distributed Systems. 2-6 credits, max 12. Prerequisite(s): CS 5113 with a grade of "C" or better. The
state-of-the-art of parallel and distributed systems. Design, implementation, and analysis of parallel and distributed system architectures, protocols, and algorithms. Resource management, scheduling, and coordination. Internet-scale systems, middleware and services, virtualization, and distributed operating systems. Parallel and distributed programming paradigms: message-passing, shared memory, data-intensive, high performance, high throughput.

**CS 6240** Advanced Topics in Computer Organization. 2-6 credits, max 12. Prerequisite(s): CS 5113 and CS 5253, each with a grade of “C” or better. The state-of-the-art of parallel and distributed systems. Design, implementation, and analysis of parallel and distributed system architectures, protocols, and algorithms. Resource management, scheduling, and coordination. Internet-scale systems, middleware and services, virtualization, and distributed operating systems. Parallel and distributed programming paradigms: message-passing, shared memory, data-intensive, high performance, high throughput.

**CS 6253** Advanced Topics in Computer Architecture. Prerequisite(s): CS 5253 or ECEN 5253, with a grade of “C” or better. Innovations in the architecture and organization of computers, with an emphasis on parallelism. Topics may include pipelining, multithreading, computer systems, and machine systems. (Same course as ECEN 6253)

**CS 6300** Advanced Topics in Programming Languages. 2-6 credits, max 12. Prerequisite(s): CS 5133 with a grade of “C” or better. 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.

**CS 6350** Advanced Topics in Operating Systems. 2-6 credits, max 12. Prerequisite(s): CS 5133 and CS 5423, each with a grade of “C” or better. Design and analysis of operating systems. Concurrent processes, server scheduling, models of auxiliary storage, memory management, virtual systems, and performance algorithms. May be repeated with a change in topics.

**CS 6400** Advanced Topics in Information Systems. 2-6 credits, max 12. Prerequisite(s): CS 5413 and CS 5423, each with a grade of “C” or better in each. Principles of distributed database systems. Overview of relational database management systems (DBMS) and computer networks, distributed DBMS architecture, distributed database design, distributed concurrency control, query processing and distributed DBMS reliability.

**CS 6500** Advanced Topics in Numerical Analysis. 2-6 credits, max 12. Prerequisite(s): MATH 5513 or CS 4513 with a grade of “C” or better, or MATH 4513 with a grade of “C” or better and consent of instructor. Systems of nonlinear equations, nonlinear least squares problems, iterative methods for large systems of linear equations, finite difference methods, solution of partial differential equations. May be repeated with change of topics.

**CS 6600** Advanced Topics in Analysis of Algorithms. 2-6 credits, max 12. Prerequisite(s): CS 5413 with a grade of “C” or better. Analysis of various algorithms. Sorting, searching, computational complexity, lower bounds for algorithms; NP-hard and NP-complete problems; parallel algorithms; proof of correctness of algorithms. May be repeated with change of topics.

**CS 6620** Advanced Topics in Applied Algorithms. 3 credits, max 12. Prerequisite(s): CS 4433 with a grade of “C” or better, or consent of instructor. Recent advances in the design and analysis of data structures and algorithms for real-world applications in a diverse problem domain. Applications of algorithms designated for the course will differ in each offering and with instructor's interests. Core topics include mathematical modeling of complex applied problems, and studies of relevant fundamental algorithmic techniques and their experimental analysis on real datasets.

**CS 6623** Algebraic Structures of Formal Grammars. Prerequisite(s): CS 5313 and CS 5663; all with a grade of “C” or better. Context-free languages, Kleene languages, Dyck languages, context-sensitive languages; use of algebraic systems to define languages; linear bounded automata.

**CS 6700** Advanced Topics in Artificial Intelligence. 2-6 credits, max 12. Prerequisite(s): CS 5793 with a grade of “C” or better, or consent of instructor. Machine learning; computer perception and robotics; logic programming; natural language understanding; intelligent agents; medical informatics. May be repeated with change of topics.

**CS 6800** Advanced Topics in Computing Networks. 2-12 credits, max 12. Prerequisite(s): CS 5803 with a grade of “C” or better. Graduate study in Computer Science; consent of instructor. Large scale embedded networks, deep-space networking, ubiquitous computing, optical networking, Next Generation Internet. May be repeated with change of topics.

**Construction Management Technology (CMT)**

**CMT 1214 Introduction to Construction.** Lab 2. Overview of the construction industry with emphasis on construction materials, methods, and systems.

**CMT 2203 Construction Drawings (for non-majors).** (Online course for non-CMT majors) Principles of graphic communication are applied to reading and drawing construction plans, with emphasis to fire protection systems. Does not meet CMT degree requirements.

**CMT 2253 Construction Drawings.** Prerequisite(s): Grade of C or better in MATH 1513 or ALEKS score of >60 or permission of department. Principles of graphic communication are applied to reading and drawing construction plans. Techniques for measuring items of construction work from plans and specifications are also covered.

**CMT 2263 Estimating I.** Prerequisite(s): Grade of C or better in CMT 1214 and CMT 2253 and (MATH 1613 or MATH 1715 or ALEKS score of >60) or permission of department. Quantity take-off with emphasis on excavation, formwork and concrete, masonry, rough carpentry and miscellaneous specialty items.

**CMT 2343 Concrete Technology.** Lab 2. Prerequisite(s): Grade of C or better in 1214 and 2253 or permission of instructor. Fundamentals of concrete and concrete manufacturing including admixtures. Proportioning concrete mixtures; batching, mixing, conveying, placing, finishing, and curing concrete. Hot and cold weather concrete, jointing, volume change and crack control.

**CMT 3273 Scheduling Construction Projects.** Prerequisite(s): Acceptance to the CMT upper-division or permission of department; grade of C or better in 2263. Scheduling basics, including bar charts and critical-path methods; manual and computer techniques using current software; emphasis on using schedules for construction project management.

**CMT 3331 Construction Practicum I.** Prerequisite(s): Grade of C or better in 1214 or 2253. Supervised field experience in construction; 400 hours minimum documented time required.

**CMT 3332 Strength of Materials for Construction Managers.** Prerequisite(s): Acceptance to the CMT upper-division or permission of department; grade of C or better in 2123 and grade of C or higher in GENT 2323. Stress and strain and their relationship to loads in buildings. Axial and bending loads on beams and columns. Applications in building and construction emphasized.

**CMT 3332 Construction Practicum II.** Prerequisite(s): Grade of C or better in 2343 and CMT 3323 and acceptance to the CMT Upper Division. Methods of structural analysis applicable to construction; design of timber structures and forms for concrete structures.

**CMT 3433 Principles of Site Development.** Lab 2. Prerequisite(s): Grade of C or better in PHYS 1214 and acceptance to the CMT Upper Division. Plumbing, heating, air-conditioning, electrical and lighting systems as applied to residences and commercial buildings.

**CMT 3554 Structures II.** Lab 2. Prerequisite(s): Grade of C or better in 3364 and acceptance to the CMT Upper Division. Analysis and design of elements in steel and reinforced concrete structures; review of shop drawings for both types of construction.

**CMT 3633 CAD and BIM for Construction Managers.** Prerequisite(s): Grade of C or better in 2263 or permission of instructor. Interpretation and production of construction drawings using computer aided drafting. Theory and use of Building Information Modeling software builds upon computer aided drafting skills.

**CMT 4050 Advanced Construction Management Problems.** 1-6 credits, max 6. Prerequisite(s): Junior standing and consent of instructor. Special problems in construction management.

**CMT 4263 Estimating II.** Prerequisite(s): Acceptance to the CMT upper division or permission of department; grade of C or better in 2263. Extensive use of actual contract documents for quantity take-off, pricing and assembling the bid for several projects. Use of computers in estimating.

**CMT 4273 Computer Estimating.** Lab 6. Prerequisite(s): Grade of C or better in 4263 and acceptance to the CMT Upper Division. Various software programs applied to estimating for building construction. Automated take off (Digitizer) systems.

**CMT 4283 Business Practices for Construction.** Prerequisite(s): Acceptance to the CMT Upper Division; grade of C or better in ACCT 2103, CMT 3273 and 4663; or permission of department. Principles of management applied to construction contracting; organizing office and field staff; bonding, liens; financial management practices; introduction to the construction management concept; schedule of values; construction bidding.

**CMT 4293 Construction Manager Concepts.** Prerequisite(s): Grade of C or better in CIV 3614, CMT 3323 and 4663; or permission of department. Principles of management applied to construction contracting; organizing office and field staff; bonding, liens; financial management practices; introduction to the construction manager concept; schedule of values; construction bidding.

**CMT 4333 Equipment Management for Constructors.** Prerequisite(s): Grade of C or higher in 2263 and ACCT 2103 and acceptance to the CMT Upper Division or permission of department. Selection and use of equipment, estimating equipment costs, estimating equipment production rates for all types of equipment used in building construction and heavy/highway construction.
CMT 4443 Construction Safety and Loss Control. Prerequisite(s): Must be accepted to the CMT Upper Division or obtain department permission. A detailed study of OSHA Part 1926 - Construction Safety and Health Compliance and related safety topics; all elements of the OSHA 30-hour training course; students completing the course are OSHA Certified Competent Persons; concepts and methods of loss control.

CMT 4533 Heavy and Highway Estimating. Prerequisite(s): Grade of "C" or better in 4263 and 4333 and acceptance to the CMT Upper Division or permission of department. CMT 4333 may be taken concurrently. Theory and application of contract estimating and bidding procedures used in heavy and highway construction projects.

CMT 4563 Construction Law and Insurance. Prerequisite(s): Acceptance to the CMT Upper Division or permission of department. Legal and insurance problems as they pertain to the construction industry.

Counseling Psychology (CPSY)

CPSY 1113 Career: Journey of a Lifetime. 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.

CPSY 3003 Introduction to Counseling and Related Professions. Professions related to counseling such as career counseling, community mental health counseling, school counseling, and substance abuse counseling are examined. Students will also learn about diversity and legal and ethical issues within counseling professions.

CPSY 3013 Introduction to Helping Skills. Prerequisite(s): Upper division standing and successful completion of CPSY 3003. This course serves as a general overview of applied helping skills for those who are considering the counseling profession or related professions as a career. Students will learn major counseling theories and will practice basic helping skills. Instructional methods will include lecture, small-group interaction, discussion, and role plays.

CPSY 3023 Mental Health in Schools and the Community. An introduction to mental health issues in school and community settings for education or other helping profession majors. Students will learn about topics such as signs of depression; substance abuse; anxiety, including test anxiety; crisis prevention and resolution; suicidality and violence in schools; bullying; domestic violence; and cyber-citizenship.

CPSY 4013 Field Experience in Counseling. Prerequisite(s): CPSY 3003 and CPSY 3013. A senior capstone/field experience for students considering graduate work in counseling psychology, school counseling, community counseling, or a counseling-related profession. The field experience provides students with the opportunity to apply the skills, knowledge, and techniques in an applied setting. Students can expect to gain an understanding of the philosophy, organization, and tasks of their field site to assist in guiding their decision for a future career path.

CPSY 4443 (D) Cultural Diversity in Professional Life. Knowledge, awareness and skills regarding cultural diversity in one's professional life.

CPSY 5000* Master's Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of advisory committee chairperson. Report of research conducted by a student in the master's program in counseling. Credit given and grade assigned upon completion and approval of the thesis.

CPSY 5173* Gerontological Counseling. An examination of mental health treatment modalities and approaches to counseling with older adults. An experiential component is included.

CPSY 5320 Seminar in Counseling Psychology. 3-9 credits, max 9. Prerequisite(s): Graduate standing. In-depth exploration of contemporary topics in counseling psychology.

CPSY 5323* Relational Cultural Theory. The goal of this course is to gain an understanding of the theoretical foundation of the Relational Cultural Model of psychotherapy.

CPSY 5413* Critical Issues in School Counseling. Counseling and guidance activities to enhance school climate and promote development of student academic, career, and personal/social competencies. Knowledge of the school counselor’s role in advocating for students with special needs.

CPSY 5453* Vocational and Career Information. Local, state and national sources of occupational information about jobs and sociological factors related to career planning and worker effectiveness.

CPSY 5473* Basic Counseling Skills. Basic attending and relationship building skills to develop an effective therapeutic relationship, establish counseling goals, and evaluate client outcomes.

CPSY 5483* Mental Health Counseling. This course provides a base of knowledge about the counseling profession, its history, philosophy, and identity. Also covered are the roles and responsibilities of the professional counselor in working competently with diverse populations through personal challenges and crises and toward wellness and prevention.

CPSY 5493* Professional and Ethical Issues in Counseling. Prerequisite(s): Admission to community counseling, elementary or secondary school counseling graduate program or consent of instructor. Principles and issues of professionalism and ethics. Seminar format with special emphasis on student’s thorough preparation for, and active participation in, class discussions.

CPSY 5503* Multicultural Counseling. Emphasis on effective communication skills in cross-cultural counseling or helping relationships and the integration of theoretical knowledge with experimental learning. Psycho-social factors, life styles, etc. of various cultural and ethnic groups and their influence on the helping relationship.

CPSY 5513* Comprehensive School Counseling Programs. Foundations of school counseling focusing on the knowledge and skills required to develop, implement, coordinate, and manage a comprehensive, developmental school counseling program.

CPSY 5523* Individual Appraisal. 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.

CPSY 5533* Developmental Interventions. Prerequisite(s): CPSY 5473. Counseling theories and techniques for working with children, adolescents, and their parents in individual and group counseling and consulting.

CPSY 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.

CPSY 5553* Theories of Counseling. Exploration of the foundations of major individual counseling theoretical approaches with opportunities for personal reflection and application.

CPSY 5563* Conceptualization and Diagnosis. Conceptualization and diagnosis through a study of principles of understanding dysfunction in human behavior or social disorganization and provides an in-depth knowledge of use of the DSM classification system.

CPSY 5583* Group Process. 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.

CPSY 5593* Counseling Practicum. Prerequisite(s): Grade of “B” or better in 5473 and 5553; admission to program or instructor consent. 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.

CPSY 5663* Counseling and Sexuality. Prerequisite(s): Permission of instructor. Current trends in counseling clients with sexual problems, as well as clients with varying sexual orientations and identities.

CPSY 5673* Substance Abuse Counseling. Prerequisite(s): Permission of instructor. Current therapeutic trends, strategies, and modalities used in the treatment of addictions, as well as relapse prevention strategies and treatment of special populations.

CPSY 5683* Internship in Counseling I. Prerequisite(s): Grade of “B” or better in 5593 and admission to counseling program. Supervised experience working and studying in a counseling agency or setting.

CPSY 5693* Internship in Counseling II. Prerequisite(s): Grade of “B” or better in 5683 and admission to counseling program. Supervised experience working and studying in a counseling agency or setting.

CPSY 5720* Workshop. 1-9 credits, max 9. Professional workshops on various topics. Designed to meet unique or special needs of professionals in various mental health fields.

CPSY 6000* Doctoral Dissertation. 1-25 credits, max 25. Prerequisite(s): Consent of advisory committee chairperson. Report of research conducted by a student in the doctoral program in counseling psychology. Credit given and grade assigned upon completion and acceptance of the doctoral dissertation.

CPSY 6053* Ethical and Legal Issues in Professional Psychology. Prerequisite(s): Consent of instructor. Ethical and legal standards applied to the professional practice of psychology.

CPSY 6083* Principles of Counseling Psychology. Prerequisite(s): Admission to the doctoral program in counseling psychology. Development, theoretical foundations and applications of therapeutic models of counseling and psychology.

CPSY 6123* Adult Personality Assessment. Prerequisite(s): Admission to the counseling, school, or clinical psychology program. Administration and interpretation of adult personality assessment instruments such as Rorschach, TAT and DAP.

CPSY 6153* Personality Theories. Prerequisite(s): Graduate standing. An in-depth analysis of personality theories and personality disorders.

CPSY 6223* Beck’s Cognitive Therapy. Prerequisite(s): Graduate standing in counseling psychology, school psychology, clinical psychology, or consent of instructor. The theory and practice of Aaron T. Beck’s cognitive therapy approach. Cognitive restructuring, problem-solving, imagery work, and cognitive case conceptualization skills to help clients with a variety of presenting problems.

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CPSY 6310* Advanced Practicum and Supervision. 3-12 credits, max 12. Prerequisite(s): Admission to counseling psychology program. For prospective counseling psychologists, counselor educators and supervisors, and practicing counselors. Supervised assistance in development of counseling, consulting, and supervising competencies.

CPSY 6313* Teaching School Interventions. Lab 1. Prerequisite(s): Admission to counseling psychology program or consent of instructor. Discussion and exploration of various aspects of group development and treatment. Theory and application of theory. Various factors associated with group psychology and counseling, group dynamics and group screening. Students can receive credit in only one of the courses. (Same course as EPSY 6323*)

CPSY 6413* Counseling Psychology Practicum I. Prerequisite(s): Admission to the doctoral program in counseling psychology. For prospective counseling psychologists. Individual and group supervision and didactic experiences to facilitate the development of counseling psychology competencies with clients at practicum sites. Establishing therapeutic conditions conducive to growth and change.

CPSY 6423* Counseling Psychology Practicum II. Prerequisite(s): Grade of “B” or better in 6413. For prospective counseling psychologists. Individual and group supervision and didactic experiences to facilitate the development of counseling psychology competencies with clients at practicum sites. Integrating theory and research into the practice of counseling psychology.

CPSY 6433* Counseling Psychology Practicum III. Prerequisite(s): Grade of “B” or better in 6423. For prospective counseling psychologists. Individual and group supervision and didactic experiences to facilitate the development of counseling psychology competencies with clients at practicum sites. Building integrating consultation skills into the practice of counseling psychology.

CPSY 6443* Counseling Psychology Practicum IV. Prerequisite(s): Grade of “B” or better in 6433. For prospective counseling psychologists. Individual and group supervision and didactic experiences to facilitate the development of counseling psychology competencies with clients at practicum sites. Building integrating consultation skills into the practice of counseling psychology.

CPSY 6543* Clinical Supervision. Prerequisite(s): Admission to clinical, counseling or school psychology doctoral program, or consent of instructor. Building the doctoral psychology student’s knowledge base in theory and research of clinical supervision in psychology, and development and refinement of the student’s supervision skills. Current theory and research in supervision, including a practical orientation.

CPSY 6553* Advanced Practice in Marital and Family Treatment. Prerequisite(s): Admission to counseling, school or clinical psychology program. 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.

CPSY 6560* Advanced Internship in Counseling. 1-3 credits, max 6. Prerequisite(s): Admission to the doctoral program in psychology. Designed to facilitate counseling effectiveness and to set the stage for a productive life of professional practice.

CPSY 6850* Directed Reading. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Directed reading for students with advanced graduate standing.

Curriculum and Instruction Education (CIED)

CIED 1230 Reading and Study Skills for College Students. 1-4 credits, max 4. Lab 1-4. Instruction and laboratory experience for the improvement of reading rate, vocabulary, comprehension, and study skills. Graded on pass-fail basis.

CIED 2450 Early Lab and Clinical Experience in Elementary Education I. 1-2 credits, max 2. Lab 3-6. Prerequisite(s): Declaration of intention to pursue a program in Professional Education. The initial pre-professional clinical experience in schools, kindergarten through grade eight. Required for full admission to Professional Education. Graded on a pass-fail basis.

CIED 3005 Foundations of Literacy. Lab 0-2. Prerequisite(s): ENGL 1113, 1213, 2413. Survey of evaluation, selection and utilization of literature of childhood; introduces cognitive and linguistic foundations of literacy; language conventions needed to compose and comprehend written and oral texts. Work in school setting.

CIED 3133 Children’s Literature Across the Curriculum. Critical, analytical and instructional skills for teaching with culturally diverse literature for elementary and middle school learners. Integration of literature across the curriculum to develop critical thinking, social literacy, and inquiry skills.

CIED 3253 Teaching Language Arts in the Elementary and Middle School. Prerequisite(s): ENGL 1113 and 1213 and 2413. Learning theory, content, and methods related to teaching spoken, written, and visual forms of communication. Focus is on listening, speaking, writing and on teaching knowledge, skills and strategies inherent in those processes. Stresses integration of central literacy components (reading, writing, speaking, listening to, and viewing a wide range of texts in a variety of forms) and across the curriculum, teaching diverse learners and perspectives, inquiry, and critical literacy.

CIED 3293 Teaching Elementary and Middle School. Prerequisite(s): ENGL 1113 and 2123 and 2413. Learning theory, content and methods specifically related to teaching children to read a wide range of texts for a wide range of purposes. Understandings of central reading components such as phonological awareness, alphabetic and phonological awareness, phonics, fluency, vocabulary, comprehension, and critical literacy. Best practices for teaching reading effectively for diverse learners with varied needs and interests. Includes program phonics exam.

CIED 3313 Field Experience in the Secondary Schools. Lab 2. Prerequisite(s): Consent of instructor, 2.50 GPA, and passing scores on the Oklahoma General Education Test. Seminars, directed observation and participation in a particular subject area of the secondary/K-12 school. Experience in meeting the mental, social, physical, and cultural needs among children.

CIED 3430 Early Lab and Clinical Experience in Elementary Education II. 1-2 credits, max 3. Lab 3-6. Prerequisite(s): Full admission to Professional Education. Directed observation and participation in classrooms, kindergarten through grade eight. Concurrent seminar exploring multicultural education and integrated programs. Graded on a pass-fail basis.

CIED 3622 Middle Level Education. Lab 0-2. Prerequisite(s): CIED 2450. Orientation to the grades 6-8 classroom as well as an examination of the curriculum, instruction, and organization of middle grade schools. Also includes a field-based experience in a middle school.

CIED 4000 Field Studies in Education. 1-4 credits, max 4. Independent study and/or field experiences, such as spending a semester in an experimental program working with the handicapped children in schools, in-depth studies in research projects, internships with school personnel. Graded on a pass-fail basis.

CIED 4005 Literacy Assessment and Instruction. Lab 0-2. Prerequisite(s): 3005 or HDFS 3213. Provides a comprehensive survey of teaching strategies, formal and informal assessment, curriculum materials, theory, and research pertaining to reading, writing, spelling and oral language development at the primary and elementary school levels. Practical experiences required.

CIED 4012 Integration of Literacy Across the Curriculum. Prerequisite(s): 4005; full admission to Professional Education. Integration of reading, writing, and oral language; integrating literacy into the content areas in elementary school curriculum.

CIED 4041 Interdisciplinary Curriculum Design and Development. Lab 2. Prerequisite(s): Full admission to Professional Education and concurrent enrollment in 3430, 4012, 4153, 4323,4353, and 4362. Planning and development of interdisciplinary teaching units for the elementary school classroom. Pedagogical approaches and materials for teaching integrated themes, as well as research on effective integrated teaching practices.

CIED 4073* Elementary School Curriculum Design and Development. Prerequisite(s): Full admission to Professional Education. Students will understand and learn to apply the foundations of elementary curriculum, the processes of designing curriculum for elementary classrooms, the analysis of instructional practices, and the data driven decision making to improve student learning.

CIED 4093 Teaching Grammar in the Secondary Schools. Prerequisite(s): ENGL 4013 (or concurrent enrollment) or instructor permission is required. Inductive teaching of grammar and usage for writing and oral communication. Lessons include learning to teach literary devices, poetic nomenclature, etymology of idiomatic expressions, and such linguistic elements as homonyms, synonyms, and antonyms.

CIED 4193 Teaching Writing in the Secondary Schools. Prerequisite(s): ENGL 1113, 1213, 3203 with “B” or better or instructor permission is required. Teaching writing inductively in order to build their future students’ reasoning skills ultimately leading to cogent, cohesive, audience appropriate writing.

CIED 4213* Introduction to Visual Arts in the Curriculum. Provides an understanding of the theoretical basis for the use of art activities in developing sensory perception and aesthetic sensitivity as an integral part of the curriculum. Includes a wide range of opportunities for student involvement in experimentation and exploration with a variety of two- and three-dimensional art techniques. 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.

CIED 4233 Literacy Assessment and Instruction. Prerequisite(s): 3253. Selection, administration, and interpretation of a variety of formal and informal literacy assessments. Use of assessment results to plan, evaluate, and revise effective instruction for diverse learners within an assessment/evaluation/instruction cycle. Tutoring practicum required.

CIED 4263* Teaching and Learning Foreign Languages in the Elementary Schools (Grades 1-8). Purpose, selection and organization of foreign language curriculum content, teaching and learning theories, and procedure and
evaluation of outcome for diverse students. Teaching techniques and materials for grades 1-8.

CIED 4313* Young Adult Literature. Prerequisite(s): Senior or Graduate level standing. 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.

CIED 4323* Social Studies in the Elementary School Curriculum. Prerequisite(s): Full admission to Professional Education. Purposes, selection and organization of content, teaching and learning procedures, and evaluation of outcomes in elementary social studies.

CIED 4362* Design and Management of the Elementary School Classroom. Prerequisite(s): Full admission to Professional Education. Introduction to the design and management of the physical, social, intellectual aspects of the elementary classroom. Overview of the purposes, selection and organization of classroom management systems and teaching approaches.

CIED 4450 Internship in Elementary Education. 1-12 credits, max 12. Prerequisite(s): Social studies enrollment in CIED 4453 or CIED 4720 and CIED 4730, successfully pass the subject area test, and full admission to Professional Education. Advanced clinical experience as associate (student) teacher in schools, pre-kindergarten through grade eight. Graded on a pass-fail basis.

CIED 4453 Senior Seminar in Elementary Education. Prerequisite(s): Concurrent enrollment in CIED 4720 and full admission to Professional Education. Legal and ethical issues, forms of assessment, including standardized testing, working with colleagues and other professionals, integration of performing arts including music and drama, and completion of a professional portfolio. Taken concurrently with student teaching in the final semester of the elementary education program.

CIED 4463 Senior Seminar: Learning and Teaching in Diverse School Cultures. Prerequisite(s): Senior classification; full admission to Professional Education and concurrent enrollment in 4450. Designing elementary classroom environments and curricula that meet the needs of diverse populations.

CIED 4473 Reading for the Secondary Teacher. Prerequisite(s): Full admission to Professional Education and consent of instructor. Materials and procedures in the teaching of reading in secondary schools for content area teachers.

CIED 4713* Teaching and Learning in the Secondary School. Prerequisite(s): Full admission to Professional Education and consent of instructor. Purposes, selection and organization of curriculum content, teaching and learning theories and procedures, and evaluation of outcomes for diverse students. Teaching techniques and materials for art, English, foreign languages, science, and social studies. This course MUST be taken the semester prior to student teaching/internship.

CIED 4720 Internship in the Secondary Classroom. 1-12 credits, max 12. Prerequisite(s): CIED 4713, CIED 4724 or CIED 4734 or CIED 4744, full admission to Professional Education and successfully passing the subject area test in the certification area of Internship. Supervised observation. Successful 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.

CIED 4724* Classroom Management in the Multicultural PK-12/Secondary School Classroom. Prerequisite(s): Full admission to Professional Education; successfully completed or concurrently enrolled in CIED 4713. Based on curriculum, teaching and theory in 4713, planning and organizing for the secondary/ PK-12 classroom in a diverse society. Classroom management and discipline approaches, teacher research, parental involvement, school climate, and community relations. Available in discipline specialized sections: art, English, foreign language, mathematics, science, and social studies.

CIED 4734 Planning and Management in the Multicultural Foreign Language K-12 Classroom. Prerequisite(s): Full admission to Professional Education. An overview of classroom management and discipline approaches, parental involvement, school climate, and community relations. Includes field experiences in a diverse secondary classroom.

CIED 4744 Planning and Management in the Multicultural Art K-12 Classroom. Prerequisite(s): Full admission to Professional Education. An overview of classroom management and discipline approaches, parental involvement, school climate, and community relations. Includes field experiences in a diverse secondary classroom.

CIED 4813* Introduction to First and Second Language Acquisition for Teachers. The overall focus of this course is on introduction to theory, research, and practices in the fields of first and second language acquisition. Understanding of language acquisition at various developmental levels, both within and outside of the classroom; and application of language acquisition theories to instructional practice.

CIED 4823* Foreign Language Instruction, Curriculum, and Assessment: Grades PK-12. Prerequisite(s): CIED 4813. History of foreign language education and teaching; understanding the role of foreign language in PK-12 programs; application of national and state foreign language learning standards in instructional planning; application of approaches, methods, strategies, and techniques of foreign language teaching; utilization of assessment tools to obtain information about foreign language learners' learning; and selection, evaluation, development, and modification of foreign language curriculum.

CIED 5000* Master's Report or Thesis. 1-6 credits, max 6. Prerequisite(s): 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.

CIED 5033* Teaching Foreign Languages in the Schools K-12. Curriculum, materials, methods and procedures related to foreign languages (grades K-12).


CIED 5053* Curriculum Issues. A study of curriculum that includes philosophy, history, decision-making, major concepts and terms.

CIED 5073* Pedagogical Research. Theory and application of pedagogical inquiry with emphasis on teacher as researcher, pedagogical question posing, and techniques of pedagogical inquiry, including narrative, autobiography, case writing, action research, and artifactual documentation of teacher performance.

CIED 5093* Curriculum Design. The theorizing and practical development of course and curriculum design. Focus on learning sciences, social implications, and interpreting student goals through state and national standards.


CIED 5143* Language Arts in the Curriculum. Content and current issues in the teaching of language arts. Materials and methods for teaching the communication skills.

CIED 5153* Advanced Studies in Children's Literature. Study of children's literature within the 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.

CIED 5173* Kindergarten-Primary Curriculum. Study of kindergarten- primary education program, including philosophy, history, current practice, and issues for administrators, teachers and students in curriculum and early childhood education.

CIED 5183* Media Literacy Across the Curriculum. Examination of the history of media literacy. Major topics and issues in the field of media literacy and curriculum in media literacy across subject areas.

CIED 5193* Inquiry and Problem-Based Learning in Science Education. Prerequisite(s): Completion of Bachelor's degree. Different aspects of teaching science through inquiry methods. Using current research as a guide, students will define scientific inquiry teaching and learning, explore assessing inquiry, and evaluate the roles of students, teachers, and discourse in the science classroom.

CIED 5203* Foundations of Literacy Education 1-8. Major literacy theories, content, and pedagogy with a required 45 hour field experience. For graduate students seeking initial certification in elementary education.

CIED 5213* Introduction to Teaching and Learning. Prerequisite(s): Admission to the MAT program. Overview of teaching and learning in the 21st Century. Requires field experience in PK-12 Classrooms.

CIED 5310* Field Experience in the Elementary School. Co-requisite(s): CIED 4362; full admission to Professional Education. Directed observation and participation in classrooms, First through grade eight. Concurrent seminar exploring multicultural education and integrated programs.

CIED 5313* Curriculum of the Elementary School. Contemporary trends, philosophies and points of view in elementary school education.

CIED 5323* Teaching Social Studies in the Schools. Curriculum, materials, methods, and procedures related to social studies.

CIED 5343* Teaching Linguistically and Culturally Diverse Learners. Pedagogical strategies and instructional theories related to English Language Learners and culturally diverse students.

CIED 5350* The Visual Arts in the Curriculum. 1-3 credits, max 6. Lab 2. 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.

CIED 5353* Literature for Children, Adolescents and Adults. Exploration of the elements and characteristics of quality literature for readers of all ages, acquisition and valuation, reception, and utilization. Research component requiring learners to design and conduct relevant research into literature learning and engagement with selected populations.

CIED 5423* Literacy Instruction in Primary Grades. Analysis of growth in literacy from the preschool level through early elementary years. Examination of instructional approaches, learning processes and language development.

CIED 5433* Reading and Writing in the Content Areas. Study of the development and use of reading and writing across the content areas.

CIED 5450* Internship in Elementary Education. Prerequisite(s): Full admission to professional education; successfully pass the subject area area OSAT; successful completion of all other course work. Clinical internship for teacher candidates in schools. Concurrent seminar on educational policy, legal, and curriculum development issues.

CIED 5463* Reading Assessment and Instruction. Lab 0-2. Prerequisite(s):
5423 or 5433 or consent of instructor. Development of knowledge of reading assessment and instruction for children and adults who find reading difficult. Laboratory experience for authentic assessment and tutoring in reading.

CIED 5473∗ Reading and Writing Difficulties. Study of research and formal assessment tools related to reading and writing difficulties in children and adults.

CIED 5483∗ Literacy and Technology Across the Curriculum. The characteristics of computer-facilitated learning relating to broad definitions of literacy. Use of a variety of computer and literacy tools across the curriculum.

CIED 5523∗ Practicum in Reading Instruction. Lab 0-2. Evaluation and instruction in reading and writing for children who experience difficulty learning to read. Collaboration among teachers, learners, and resource personnel.

CIED 5553∗ Literacy Leadership and Coaching. Prerequisite(s): 5463. Develops skills and knowledge for school literacy program design and leadership, and for coaching other teaching professionals in literacy teaching.

CIED 5623∗ Multicultural and Diversity Issues in Curriculum. Understanding of the historical and contemporary perspectives toward cultural diversity. Development of an awareness of diverse culture and language communities; understanding of critical issues of race, class, gender, and ethnicity in education; perennial issues of multiculturalism in public education and in global society; a comprehensive overview of principles and current research on bilingual and multicultural education.

CIED 5640∗ Special Topics in Literacy Education. 1-6 credits, max 6. Topics vary to address special topics in literacy education.

CIED 5643∗ Integrating Teaching at the Elementary Level. Study and analysis of theories related to children's learning and implications for integrating teaching at the elementary level. Examination of teachers' own practices, through reflection and research, study diverse populations, share teaching approaches and materials across the curriculum, and explore outreach to school, family and community.

CIED 5653∗ Integrating Teaching in the Secondary School. In-service for middle to secondary teachers especially with professional development in their own school settings and in further graduate work. Examination of own practices through reflection and research, study of diverse adolescents, sharing of teaching approaches and materials across the curriculum, and exploration of outreach to school, family and community. Teacher leadership.

CIED 5710∗ Internship in Secondary School. Prerequisite(s): full admission to professional education; successfully pass the subject area OSAT; successful completion of all other course work. Advanced clinical experience for teacher candidates (student teacher) in secondary schools.

CIED 5720∗ Education Workshop. 1-8 credits, max 8. For teachers, principals, superintendents and supervisors who need advanced curriculum and instruction course work related to K-12 subject areas and pedagogy, in the areas of instruction and administration. Students must register for the full number of credit hours for which the workshop is scheduled for a particular term.


CIED 5730∗ Seminar in Education. 1-6 credits, max 6. Seminar topics may differ depending upon the nature of current interests and topics in American education. (Same course as 4560†)

CIED 5733∗ History of Reading. Prerequisite(s): Graduate standing with the Graduate College. This course provides an examination of the historical landscape of reading education paradigms, research, theory development, instruction, and policy in the U.S. Key research pioneers in reading/literacy education and their work, from a variety of “camps” (e.g. psychological or information processing, phonics, behaviorist, constructivist, reading and writing process, sociocultural, etc.), will also be examined.

CIED 5810∗ Internship Art and Foreign Language in PK-12 School. Prerequisite(s): full admission to professional education; successfully pass the subject area OSAT; successful completion of all other course work. Advanced clinical experience for art or foreign language teacher candidates (student teacher) in PK-12 schools.

CIED 5813∗ Educational Advocacy and Leadership. Preparation of teachers as advocates and leaders in educational policy and practice at various levels. Skills in action research, policy analysis, and coalition building leading to advocacy.

CIED 5850∗ Directed Study. 1-6 credits, max 6. Lab 1-6. Prerequisite(s): Consent of instructor. Directed study for master’s level students.

CIED 5853∗ Teaching Writing GR 1-8. Prerequisite(s): Admission into MAT program. Learning theory, content, and methods related to teaching spoken, written, and visual forms of communication. Focus on listening, speaking, writing and on teaching knowledge, skills and strategies inherent in these processes. Stresses integration of central literacy components and across the curriculum, teaching diverse learners and perspectives, inquiry, and critical literacy. Meets with CIED 3525. No degree credit for those with credit in CIED 3253.

CIED 5893∗ Reading Processes and Practices GR 1-8. Prerequisite(s): Graduate Standing and consent of Instructor. Learning theory, content, and methods specifically related to teaching children to read a wide range of texts. Understandings of central reading components such as print awareness, phonological/phonemic awareness, phonics, fluency, vocabulary, comprehension, and critical literacy. Best practices for teaching reading effectively for diverse learners with varied needs and interests. Includes professional/phonics exam. Meets with CIED 3293. No degree credit for those with credit in CIED 3293.

CIED 5963∗ Teaching Grammar in the Secondary Schools. Prerequisite(s): Graduate status or instructor permission. Students learn to teach language inductively to build thinking, language and writing skills. Meets with CIED 4093. No degree credit for those with credit in CIED 4093.

CIED 5973∗ Formative Literacy Assessment GR 1-8. Prerequisite(s): CIED 5893 and CIED 5853; or consent of instructor. Selection, administration, and interpretation of a variety of formal and informal literacy assessments. Use of assessment results to plan, evaluate, and revise effective instruction for diverse learners within an assessment/evaluation/instruction cycle. Tutoring practicum required. Meets with CIED 4233. No degree credit for those with credit in CIED 4233.

CIED 5993∗ Teaching Writing in the Secondary Schools. Prerequisite(s): Graduate status or instructor permission. Students learn to teach writing inductively by building the reasoning skills that lead to cogent, cohesive, audience-appropriate writing. Focus is on increasing the underlying skills necessary for writing description through argumentation. Meets with CIED 4193. No degree credit for those with credit in CIED 4193.

CIED 6000∗ Doctoral Dissertation. 1-25 credits, max 25. Required of all candidates for the Doctor of Philosophy degree. Credit is given upon completion of the dissertation.

CIED 6013∗ Assessment in Science Education. Prerequisite(s): Completion of a bachelor’s degree. Guided readings, discussions, and group activities focus on strengthening students' understanding of state and national assessments in science education.

CIED 6030∗ Contempoary Issues in Curriculum Studies. 1-6 credits, max 6. Examination of selected contemporary topics in curriculum studies.

CIED 6033∗ Analysis of Teaching. Advanced study of multiple forms of analysis of teaching such as behavioral, phenomenological, and constructivist with emphasis on major research on teacher reflection and teacher narrative.

CIED 6043∗ Curriculum Leadership. A study of curriculum leadership and implications for schooling; focus on what it means to be a curriculum leader in times of major societal change and educational reform.


CIED 6060∗ Advanced Special Topics in Literacy Education. 1-6 credits, max 6. Topics vary to address special topics in literacy education at the doctoral level.

CIED 6063∗ Curriculum History. Examines in-depth the history of various movements in U.S. curriculum thinking and the individuals who promoted them, with attention to the cultural and institutional contexts within which they worked. Emphasis is given to primary sources and the position of curriculum thinking within developing educational thought.

CIED 6070∗ Seminar in Arts and Humanities Education. Prerequisite(s): graduate standing or instructor permission is required. Topics, research trends, theories, themes, and/or problems of interest and use in research, theorizing, publishing, and teaching. Particular focus on the skill of writing a theoretical lens and analyzing texts through that lens.

CIED 6073∗ Advanced Pedagogical Research. Advanced theory and application of pedagogical research with emphasis on teacher as researcher, teacher research as professional development and education reform, techniques of pedagogical research and pedagogical question posing.

CIED 6083∗ Seminar in Writing Pedagogy. Prerequisite(s): Graduate standing with Graduate College. Seminar works in theory and research related to the teaching of writing in K-16 settings are examined. Students will examine the scholarship on genre theories, writing process theory, and writing pedagogy, considering the practical classroom implications and applications for this work. The course relies on reading, discussion, synthesis of key concepts, and individual inquiry as central learning processes.

CIED 6090∗ Readings in Arts and Humanities Education. Prerequisite(s): graduate standing or instructor permission is required. In-depth readings specific to research and theorizing in arts and humanities education. Focusing on analysis, students examine primary texts and related secondary texts.

CIED 6133∗ Theory to Practice in Education. A culminating seminar demonstrating the application of theory inherent in the practical problems of education: curriculum development, organization, teaching strategies and evaluations.

CIED 6143∗ School Reform. Current issues in school reform with an emphasis on U.S. education; focus on what it means to engage in reform from dual points of view: curriculum leader and recipient of reform mandate.

DANC 3603 Choreography. Prerequisite(s): DANC 2602 or permission of instructor. An introduction to dance composition and the choreographic process. Students will learn and execute the fundamentals of dance choreography.

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DHM 1003 Design Theory and Processes for Design and Merchandising. Lab 4. Prerequisite(s): DHM majors only. Design elements, principles and processes applied to design and merchandising.

DHM 1101 Wicked Problems of Industrial Practice. An overview of the complex and seemingly insolvable and every-evolving environmental and social issues (wicked problems) of today’s industrial practice. A brief introduction to sustainable design theory is also provided.

DHM 1103 Basic Apparel Assembly. Lab 4. Basic apparel assembly techniques. Basic fit, spreading and cutting methods and equipment, and use and application of sewing equipment, including lock, chain, and overedge.

DHM 1123 Graphics for Interior Design I. Lab 4. Prerequisite(s): DHM majors only. Drafting and visual communication techniques related to interiors.

DHM 1433 Introduction to Apparel Merchandising. An overview of variables affecting production and distribution of consumer goods; development of present structure in consumer products industries.

DHM 1993 Communications and Presentation Techniques for Apparel Design. Lab 6. Prerequisite(s): 1003. Creative communication methods and techniques, including a variety of media for two- and three-dimensional presentations in apparel design.


DHM 2073 Computer-Aided Design for Interior Design. Lab 4. Prerequisite(s): 1103 and pass proficiency review. Computer-aided design and drafting for two-dimensional and three-dimensional interior systems.

DHM 2103 Interior Design Studio I: Residential. Lab 4. Prerequisite(s): Pass proficiency review. Studio course utilizing the design process in the analysis and planning of residential environments using computer-aided and hand drafting techniques.


DHM 2212 Heritage of Dress I. Prerequisite(s): 3 credit hours of history. Survey of ancient to Baroque European modes of dress, as that clothing reflects the environment and cultural life of a people.

DHM 2233 Graphics for Interior Design II. Lab 4. Prerequisite(s): DHM 1123. Applied creative solutions to visual communication formats and media; free-hand sketching, informational graphics, rendering techniques for product and material illustrations, floor plans, elevations and 3-D room interiors/architectural detailing.

DHM 2253 Interior Design Studio II: Small Scale Contract. Lab 4. Prerequisite(s): 2073 and 2103. Analysis and planning of small office, hospitality and retail environments with emphasis on materials, lighting, codes and accessibility using computer-aided 2D drafting and 3D modeling techniques.

DHM 2301 Supervised Field Experience. Prerequisite(s): 2263 or consent of instructor. Field experience in specialized residential, commercial and institutional design with both historic and contemporary elements.

DHM 2403 Research Methods. Prerequisite(s): MATH 1483 or MATH 1513. Qualitative and quantitative data collection methodologies for the fields of Apparel, Interior Design and Merchandising. Basic understanding of data analysis and use of data to guide managerial decision making.

DHM 2423 Technology and Visual Communication for Merchandisers. Lab 4. Prerequisite(s): 1003 or 1433. The development of communication skills for marketing, promotional, and merchandising applications as well as personal branding utilizing industry-relevant technological practice.

DHM 2444 Draping. Lab 6. Prerequisite(s): DHM 2203 with “C” or higher and pass proficiency review. Interpretation of garment design developed through the
medium of draping on dress forms.

DHM 2573 (L.N) Textiles. Lab 2. Science principles as the basis for understanding fibers, the basic structure of yarns and fabrics. Relationships between the chemical composition of fibers and properties such as tensile strength, flammability, elasticity, moisture absorption, and dye affinity. Understanding science principles in relation to textile properties for evaluation of textile products. Recommended for education majors seeking knowledge to be used for innovative teaching of science principles in grades K-12. Required for all DHM majors.

DHM 2913 Sewn Product Quality Analysis. Prerequisite(s): 1433, 2573. Sewn product manufacturing process with emphasis on evaluating product quality and its relationship to performance. Examined from the retailers' manufacturers', and consumers' perspectives.

DHM 3013 Flat Pattern Design. Lab 6. Prerequisite(s): 2444 and pass proficiency review and MATH 1483 or 1513. Interpretation of dress design developed through the medium of flat pattern; introduction to pattern drafting.

DHM 3023 Computer-Aided Flat Pattern Design. Lab 6. Prerequisite(s): 3013 and pass proficiency review. Advanced apparel design problems using flat pattern and computer-aided design (CAD) techniques.

DHM 3033 Material Culture. Prerequisite(s): DHM majors only and completion of 30 credit hours. An exploration of a variety of theoretical approaches toward understanding what objects mean. Psychological, sociological, economic, and other approaches are examined using culture theory models.

DHM 3053 Quality Analysis for Apparel Design. Prerequisite(s): DHM majors only and 1433, 2203, 2573 or consent of instructor. Evaluation of product quality relating to target market, materials, and construction.

DHM 3103 Anthropometry and Ergonomics in Design. Prerequisite(s): DHM 2403. Methods and principles for representing body size, fit, accommodation, proportion, and postural function using techniques that ensure that product designs are practiced in a portfolio of individual projects. Exercises in color theory and manipulation, and a discussion of color theory models.

DHM 3173 Digital Design Communication. Prerequisite(s): DHM 2073. Introduction of digital media tools for 2D and 3D design visualization and presentation. Understanding concepts and techniques of computer applications for design communication.

DHM 3203 Functional Clothing Design. Prerequisite(s): DHM majors only and 1993 and 3023. Building on CAD skills using software as applied to apparel design and production. Development of technical packages and specification materials.

DHM 3213 (H) Heritage of Dress II. Prerequisite(s): ENGL 1213 and 3 credit hours of history. Survey of historic modes of dress as they reflect the social, economic, and cultural life of a people. Application of design principles to modern dress.

DHM 3233 (H) Heritage of Interior Design I. Prerequisite(s): DHM 2103, DHM 2233 and ENGL 1213. 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.

DHM 3303 Materials and Finishes for Interior Design. Prerequisite(s): 2263 (Interior Design students) or 1123 and 2573 (Merchandising students). An overview and examination of interior materials and finishes.

DHM 3343 Interior Design Studio III: Interior Components and Construction Documents. Lab 4. Prerequisite(s): 2263. Studio course exploring the design, materials, construction and production of interior design projects. Small scale commercial projects are computer-aided and hand drafted documents and renderings for visualization of design solutions.

DHM 3422 Styling for Merchandisers. Prerequisite(s): DHM 2423. A review of the elements of style and adjustability, including photography and model fundamentals. An emphasis in styling techniques for digital and print merchandising applications.

DHM 3433 Merchandising Strategies in the Retail Sector. Prerequisite(s): DHM majors or minors only, or by permission of instructor, and DHM 1433 and ACCT 2103 with minimum grade of "C". The use of financial and management strategies for successful retail merchandising.

DHM 3453 Interior Design Studio IV: Environmental Design. Lab 4. Prerequisite(s): 3343. Exploration of the design factors and human performance criteria for lighting, acoustics, and thermalpsychological comfort and their applications in studio projects using computer-aided and hand drafted techniques.

DHM 3533 Textile Surface Design. Prerequisite(s): DHM 1003 and DHM 2573 and DHM 1993 or DHM 2423 or equivalent. Traditional and contemporary dyeing, printing, stitching, and other textile surface manipulation techniques are practiced in a portfolio of projects. Exercises in color theory and production inform textile design work. Aesthetic, methodological, and environmental tradeoffs are considered in relation to designing textile surfaces.

DHM 3553 Profitable Merchandising Analysis. Prerequisite(s): DHM 3433, ACCT 2103, MATH 1483 or MATH 2103. Relationship analysis of profit and loss statement. Retail mathematical calculations necessary to plan and control merchandising results culminating with initial development of a six-month buying plan.

DHM 3563 Merchandise Acquisition and Allocation. Prerequisite(s): 3433, 3553. In-depth study of buying and distributing merchandise.

DHM 3643 Apparel and Accessories for Special Markets. Prerequisite(s): DHM 2263. Specific terminology, procedures, relationships and ethics pertaining to the organization and conduct of interior design practice globally.

DHM 3823 Professional Practices for Interior Design. Prerequisite(s): DHM 2263. Specific terminology, procedures, relationships and ethics pertaining to the organization and conduct of interior design practice globally.

DHM 3853 Visual Merchandising. Lab 2. Prerequisite(s): 1003, 1433, 2423 and completion of 60 credit hours. Study and application of principles and practices in merchandise presentation for commercial purposes.

DHM 3881 Interior Design Pre-Internship Seminar. Prerequisite(s): DHM majors only, 2073, 3343, 3823, SPCH 2713, and HS 1112 or 3112 (or concurrent). Preparation for obtaining and completing a directed practical experience in a work situation in the interior design field.

DHM 3991 Pre-Internship Seminar. Prerequisite(s): DHM majors only and concurrent. Preparation for obtaining and completing a directed practical experience in an approved work situation related to the fashion industry.

DHM 3994 Professional Internship in Merchandising or Apparel Design and Production. Prerequisite(s): DHM majors only and (merchandising students) 3553 and 3853 or (apparel design and production students) 3023 and 3123; and HS 1112 or 3112. Directed practical experience in an approved work situation related to the fashion industry.


DHM 4011 Post-Internship Seminar. Prerequisite(s): DHM majors only. 3994. Study and comparison of student work experiences. Individual student conferences, review of merchant supervisor reactions.

DHM 4031* Emphatic Design. Exploration of a socially-oriented approach to design as a step into the lives of people. Emphasis on the role of design in solving social problems and improving the quality of life. An examination of social problems and improving the quality of life. An overview of current design approaches in relation to the social, economic, and environmental topics. DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4041* Tripe Bottom Line Analysis. Quantitative analysis and evaluation of economic, social and environmental costs associated with industry practice. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4051* Biomimetic Industrial Practices. Exploration of sustainable solutions to challenges imposed by human beings through emulation of principles inherent in nature. Emphasis on applications in design. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4061* Active Design. Principles of design of products and human-built environments that encourage physical activity, improving the health of individuals, communities, and the planet. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4071* Communicating Sustainable Practices. Exploration of the variety of ways in which designers and merchandisers communicate sustainability product and service features, including an examination of regulatory oversight and other mechanisms that support transparency such as certification, labeling, and reporting. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4081* Design Activism. Exploration of theories for social and environmental justice addressing designers’ and merchandisers’ roles as positive change agents. Focus on theories and applied methods demonstrating design activism as a catalyst to reinvigorate the social practice of design and merchandising. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4091* Sustainable Material Flows. Introduction to the design philosophy that biological and technical waste can be recycled indefinitely to feed the manufacturing industry. Case studies of practical applications. Challenges and reporting. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4101* Local Motive and the Supply Chain. Principles and concepts of local commerce and sustainability in the supply chain from an interdisciplinary perspective. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

DHM 4111* Ethics for a Sustainable World. Exploration of ethical dilemmas
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An examination of textile production and use practices that are detrimental to the global environment: completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

**DHM 4211* Sustainable Textile Innovation.** An examination of textile production and use practices that are detrimental to the global environment: completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

**DHM 4241* Life Cycle Analysis in Design and Merchandising.** Principles and application of Life Cycle Assessment (LCA) technique for products, processes, and activities. Analyses of energy and material inputs and outputs and their impact on the environment and human health; implications for decision-making. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

**DHM 4141* 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 project.

**DHM 4151* Sustainable Consumption.** An exploration of principles and concepts of sustainable consumption and analysis of the application of sustainability in consumers' daily lives. Completion of DHM 1101, Wicked Problems of Industrial Practice, is recommended prior to enrolling in this course.

**DHM 4153* Mass Production of Apparel and Related Products.** Prerequisite(s): DHM majors and DHM 3053 and DHM 3123. Understanding and applying mass production strategies for apparel related products. Includes design for production, production operations including CAD marker making and material utilization, production simulation, modeling and costing.

**DHM 4163* Housing in Other Cultures.** Housing and interior design and expressions of cultural beliefs, attitudes, family patterns and environmental influences.

**DHM 4264* Interior Design Studio V: Large Scale Commercial.** Lab 6. Prerequisite(s): 3453, 4373, and 4824. Analysis of large scale office planning and institution design including systems and specifications and emphasizing computer-aided design techniques for construction documents and presentations.

**DHM 4294* Interior Design Studio VI - Capstone.** Lab 6. Prerequisite(s): 4294. Studio course focusing on the design process and the analysis and planning of hospitality design and/or institutional design such as health care and education. Approaches includes the consideration of the impact on facility management.

**DHM 4323 (I) Heritage of Interior Design II.** 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.

**DHM 4373* Advanced Computer-Aided Design for Interior Design.** Lab 4. Prerequisite(s): 2073 and 3453. Advanced computer-aided design and visualization for three-dimensional interior systems.

**DHM 4403* Advanced Apparel Design.** Lab 6. Prerequisite(s): 2444 and 3023. Application of design and pattern-making principles and apparel assembly processes in the development of original designs.

**DHM 4423* Heritage III: Designing for Progress.** A thematic survey of movements affecting the design of the built environment after 1900. Social and political developments as generators of new building types, construction techniques and materials, and architectural styles and stylistic directions.

**DHM 4433* Facility Management and Design.** Survey of nine competency areas of facility management and design, ensuring functionality of the built environment by integrating people, places, processes and technology.

**DHM 4453* Product Development Processes.** Prerequisite(s): ECON 1113 or ECON 2103 and completion of 90 credit hours. The processes for new product development targeted to a specific market of consumers for start-up and established companies.

**DHM 4503* Couture Techniques.** Lab 4. Prerequisite(s): 2443. Advanced clothing construction techniques using couture methods.

**DHM 4523* Critical Issues in Design and Merchandising.** Prerequisite(s): Senior standing in major. Capstone course examining professional issues in design and merchandising in the context of central themes from general education.

**DHM 4533 (D) Diversity Issues in Facility Management and Design.** In-depth study of facility management and design issues focused on diversity in a variety of workplace types including: office, retail stores, hotels, restaurants, government, educational and cultural institutions.

**DHM 4573* Sustainable Design for Apparel and Interiors.** Prerequisite(s): CHEM 1014 or equivalent, and DHM 2673, 3033 and completed 90 hours. New DHM majors: no prerequisite. A brief review of contemporary environmental, social and economic issues associated with industry practice; a broad exploration of sustainable design theories which may be applied in the apparel and interiors fields, from eco-efficiency to socially-driven changes.

**DHM 4810* Problems in Design, Housing and Merchandising.** 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Selected areas of study in design, housing and merchandising.

**DHM 4824 Professional Internship in Interior Design.** Prerequisite(s): DHM majors only, 3453, 3881, 4373. A supervised internship experience that simulates the responsibilities and duties of a practicing professional in interior design.

**DHM 4850* Special Unit Course in Design, Housing and Merchandising.** 1-6 credits, max 6. In-depth study of specific areas of design, housing and merchandising.

**DHM 4893* Fundamentals of Medical Smart Garment.** Prerequisite(s): completion of 90 credit hours or Graduate standing. Students will gain elementary knowledge in focus areas of health science, biomedical sensing and analytics, and apparel design necessary to undertake the development of wearable electronic sensing systems. Lecture and laboratory systems. May not be used for degree credit with BIOM 6933, IEM 4893 or IEM 5893.

**DHM 4900 Honors Creative Component.** 1-3 credits, max 3. Prerequisite(s): College of Human Sciences Honors Program participation, senior standing. Guided creative component for students completing requirements for College Honors in the College of Human Sciences. Thesis, creative project or report under the direction of a faculty member in the major area, with second faculty reader and oral exam.

**DHM 4993 Global Sourcing Strategies.** Prerequisite(s): 3 credit hours of ECON and 90 credit hours. Broad multi-disciplinary study of the soft goods industries in the global economy.

**DHM 5000* Master's Thesis.** 1-6 credits, max 6. Prerequisite(s): Graduate standing and consent of major professor. Research related directly to design, housing and merchandising for the master's thesis.

**DHM 5001* Orientation to Graduate Studies in Design, Housing and Merchandising.** Process of developing a graduate plan of study in the Department of Design, Housing and Merchandising. Fundamental skills needed for successful completion of a DHM graduate degree.

**DHM 5003* 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.

**DHM 5010* Thesis Equivalency for Doctoral Students.** 1-6 credits, max 6. Prerequisite(s): Doctoral student standing and consent of supervising instructor and DHM 5013 and STAT 5013, or equivalent courses. Research related directly to design, housing or merchandising, conducted for the purpose of removing a master’s degree research thesis deficiency.

**DHM 5013* Research Developments in Design, Housing and Merchandising.** Prerequisite(s): DHM 5003. Current methods and needs in research for design, housing and merchandising including the application and integration of research into design, housing and merchandising practice.

**DHM 5112* Research Planning and Proposal Writing.** Prerequisite(s): 5001, 5013. Fundamentals of planning and completing qualitative and quantitative research projects, including writing the proposal.

**DHM 5113* 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.

**DHM 5153* Housing in Different Cultures.** Prerequisite(s): Graduate student status, Housing and life style as an expression of cultural aesthetics, beliefs, attitudes and environmental influences.

**DHM 5213* Product Design, Production and Promotional Strategies for Apparel and Interior Design Industries.** Lab 2. Prerequisite(s): 5113. An overview of product design and production techniques for apparel and interior design markets using an industry approach. Promotional strategies needed for successful advertising campaigns.

**DHM 5233* Design Evaluation.** Prerequisite(s): Consent of instructor. Theoretical perspectives on evaluation of applied design; examination and evaluation of historic and contemporary designers, their philosophies and their work.

**DHM 5240* Master’s Creative Component.** 1-6 credits, max 6. Prerequisite(s): Consent of major professor and department head. An in-depth design application of theoretical design models and philosophies. A maximum of six hours to be used by graduate students following Plan III for the master’s degree.

**DHM 5273* 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.

**DHM 5303* Sociological, Psychological and Economic Aspects of Consumer Behavior.** 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.

**DHM 5343* Constructed Environment and Human Behavior.** Prerequisite(s): 5013, 5273, PSYC 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.

DHM 5633* Graduate Interior Design Studio. Prerequisite(s): Consent of instructor. Studio exploring alternative, research-based design solutions for selected interior environments.

DHM 5636* Advanced Studies in Design, Housing and Merchandising. 1-6 credits, max 6. Investigation into special areas in the fields of design, housing and merchandising.

DHM 5633* Color Theories and Applications for Apparel and Interiors. Prerequisite(s): Nine hours in DHM graduate courses or consent of instructor. Survey of color theories as they apply to the physical, psychological, and aesthetic aspects of apparel and interiors.

DHM 5440* Career Internship. 1-6 credits, max 6. Prerequisite(s): Consent of instructor and department head. An individualized career-oriented internship. Selected learning experiences in approved work situations in industry, government, education or research institutions related to design, housing or merchandising.

DHM 5503* Housing and Real Estate for Family Financial Planning. Overview of the role of housing and real estate in financial planning process from a theoretical perspective. Taxation, legal aspects, mortgages, and financial calculations related to home ownership and real estate investments. New and emerging issues in the context of housing and real estate. Role of ethics in financial planning including housing and real estate.

DHM 5533* Theory and Design of Functional Apparel. Lab 2. Prerequisite(s): 2573, 3013, 5013, or consent of instructor. 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.

DHM 5543* Textile Arts and Design. Lab 6. Prerequisite(s): Permission of instructor. Advanced application of design concepts developed through experimental studies in textile surface design and manipulation resulting in portfolio/competition quality designs/artwork and written documentation for submissions to a "juror selection" format exhibition.

DHM 5603* Historical and Contemporary Issues in Trade. The examination of fiber, textile, and apparel industries in a global context. The historical development of the global and U.S. textile and apparel industries and how the global environment (economic, political, and social systems) affects the textile and apparel production and trade.

DHM 5613* Merchandising Research Methods. Prerequisite(s): 5303, 5623, 5633, 5643, 5653 and graduate course in Statistics. An overview of the research process used in social science, including a survey and analysis of research methodologies. A review of current merchandising literature with implications for future research.

DHM 5623* Professional Advancement in Merchandising. Analysis of leadership and how it affects organizational culture and change through a prism of past and current experiences. Various leadership styles examined and a personal leadership philosophy developed for professional advancement in merchandising.

DHM 5633* Product Design, Development and Evaluation. Advanced study of issues and management strategies necessary to design and produce a competitively priced product. Examination of the role of globalization and rapidly changing technology on the development of a successful product.

DHM 5643* Promotional Strategies in Merchandising. Examination of integrated marketing communications (i.e., promotional strategies and techniques) while fostering cultural and global awareness, social responsibility and ethical decision-making in the market of promotion.

DHM 5653* Merchandising Trends, Practices and Theories in Apparel and Interior Industries. Prerequisite(s): Nine credit hours in marketing, merchandising or management. Current trends in merchandising; theories, concepts and processes related to management level problems.

DHM 5663* International Merchandising Management. Prerequisite(s): Merchandising or business courses or consent of the instructor. Comprehensive understanding of theory, practices, and trends in international merchandising management. An analysis of global retail systems and the way goods are distributed to consumers in various countries.

DHM 5673* Financial Merchandising Implications. Advanced study of financial trends in the merchandising industries; implications related to sole proprietors, partnerships, franchises, S corporations, and C corporations. Foci will be on the financial implications of recent advances in the field that assist graduate students as they embark on careers in academic and/or the merchandising industries.

DHM 5683* Strategic Planning for the Merchandising Executive. Examination of the merchandising executive planning process utilized to develop successful corporate strategies. Emphasis on the importance of a market orientation for building customer value and sustaining a competitive advantage.

DHM 5810* Problems in Design, Housing and Merchandising. 1-3 credits, max 6. Prerequisite(s): Consent of instructor and department head. Individual and group investigations and discussions of special problems in the various phases of design, housing and merchandising.

DHM 5963* Case Studies in Medical Smart Garment. 1-3 credits. Prerequisite(s): 4893 or consent of instructor. Advanced training course designed to activate critical thinking skills needed for problem solving in wearable sensing system development. (Same course as BIOM 5963).

DHM 5984* Capstone in Medical Smart Garment Engineering. 1-3 credits. Prerequisite(s): 4893 or 5683 and DHM 5963 or consent of instructor. Project-based course where interdisciplinary teams identify a wearable sensing application and collaborate to engineer a prototype that addresses a defined need. Industry collaboration encouraged. (Same course as BIOM 5984).

DHM 6000* Doctoral Dissertation. 1-12 credits, max 30. Prerequisite(s): Completion of a master’s research thesis or thesis equivalency and consent of major instructor. Research in design, housing and merchandising for the PhD degree.

DHM 6133* Research Methods in Design, Housing and Merchandising. Prerequisite(s): 5112 and 5013 or equivalent and six credit hours of graduate level statistics. Survey and discussion of research methods, experiences in research design and analysis of data.

DHM 6363* Anthropometrics in Product Design. Prerequisite(s): Graduate standing and 6133 or equivalent. Variability of human body measurements and their relationships (body shape) as determinants for product design. Theory and practice of anthropometry and ergonomics (human factors) as applied to apparel and/or interior design. Comfort, performance, health, and safety issues in product design for men, women, children, and special populations.

DHM 6383* Design, Housing and Merchandising in Higher Education. Prerequisite(s): Nine credit hours in design, housing and merchandising. Development and organization of curricula and teaching methods for design, housing and merchandising.

DHM 6403* Merchandising Theory Application and Strategy Implementation. Prerequisite(s): 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.

DHM 6410* Independent Study in Design, Housing and Merchandising. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Selected areas of design, housing and merchandising for advanced graduate students working toward the doctoral degree.

DHM 6413* International Consumer Behavior. Prerequisite(s): 5303. A critical understanding of theoretical and methodological issues with an emphasis on consumer behavior from a cross-cultural perspective and applications of this knowledge to international consumer research and strategy development in international markets.

DHM 6463* Project Management. Analysis of project management strategies and techniques used by architecture, interior design, and construction management firms relating to budget, schedule and personnel, with emphasis on leadership, quality assurance, and risk management issues.

DHM 6810* Advanced Problems in Design, Housing and Merchandising, 1-6 credits, max 6. Prerequisite(s): 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.

DHM 6830* Design, Housing and Merchandising Seminar. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Problems and recent developments in design, housing and merchandising.

Diversity (DIVR)

DIVR 2003 (D,S) Inclusion Leadership. Focus on developing and refining leadership skills in order to prepare for success in personal and professional lives. Develop inclusive leadership skills; increase knowledge regarding global leadership and successful living within a global society.

DIVR 2213 (D,S) Minorities in Science and Technology: Contributions Past, Present and Future. Women, racial and ethnic minorities are underrepresented in science and technology in America. STEM (science, technology, engineering, and mathematics) fields are traditionally perceived as unwelcoming for these groups. This course examines this idea by focusing on the notion of a “Chilly Climate” for minorities in technical fields. The contributions of prominent women and minority scientists and engineers in America will be explored, as well as the struggles they overcame to achieve. This course also explores current issues and why inclusiveness matters today and in the future.

DIVR 2233 (D,S) Diversity and Inclusion in 21st Century America. This course is designed to increase awareness and understanding of diversity and inclusion in the United States. It focuses on the complex and often controversial issues of race, sex, gender, sexual orientation, social class, and disability by assessing the effects these categories have on society. This course will examine the historical context and how the United States has reached current categories of difference.
ECON 4913* Urban and Regional Economics. Prerequisite(s): Three credit hours in economics. Areas related to the world economy; obstacles to economic growth and policies for promoting growth.

ECON 4723* Economics Analysis of Law. Prerequisite(s): Three 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 effectiveness. Emphasis on the economics of the common law property, contracts, and torts. Also, products liability, crime and punishment, distributive justice, and discrimination.

ECON 4580* Applied Studies in Economics. Prerequisite(s): 12 credit hours in economics and consent of instructor. Structured internship or field project with supervised independent study. Arrangement or supervised independent studies.

ECON 4993 Economics Honors Thesis. Prerequisite(s): 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.

ECON 5000* Research and Thesis. 1-6 credits, max 6. Workshop for the exploration and development of research topics. Research leading to the master's thesis.

ECON 5003* Research Report. Prerequisite(s): Consent of committee chairperson. Supervised research for MS report.

ECON 5010* Research and Independent Studies. 1-3 credits, max 10. Prerequisite(s): Consent of departmental committee under a workshop arrangement or supervised independent studies.

ECON 5013* Contemporary Environmental Policy. Economic, social and political factors that influence the formation and implementation of environmental policy. Environmental policy instruments such as 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.

ECON 5033* Macroeconomic Analysis. Prerequisite(s): Three hours of related economics or consent of instructor. Study of the determinants of aggregate output, employment, price level, and interest rates, including international aspects. Monetary, fiscal, and exchange rate policies and impact on the macroeconomy and business environment. No credit for PhD students in economics.
ECON 5043* Microeconomic Analysis. Prerequisite(s): 3113 and MATH 2144 or consent of instructor. A calculus-based microeconomics course developing basic consumer, producer, and equilibrium models.

ECON 5053* Impact Evaluation of Public Policies. Prerequisite(s): Introductory econometrics or instructor consent. The primary goal of this course is to familiarize students with evaluation methodology and tools commonly used to assess policy and related policies. Students will become familiar with the concepts, methods and applications of impact evaluation; learn how to read evaluation research critically; understand how to use evaluation results to anticipate or improve public policies; and be able to propose an appropriate evaluation plan to assess the implementation and effectiveness of a public policy.

ECON 5113* Managerial Economics. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Economic theory applied to business decision-making. Concepts of microeconomics and macroeconomics related to understanding the economic system, analysis of policy, forecasting, and international economics. No credit for PhD students in economics.

ECON 5173* Energy Economics. Prerequisite(s): ECON 5113 or 2103 or equivalent. Develop tools necessary to examine energy markets from an economics perspective and discuss aspects of local, national and global financial issues such as global current account imbalances, the role of organizational architecture (the assignment of decision-making rights, performance evaluation, and reward systems within an organization). An appropriate architecture to give an organization a competitive advantage and performance evaluation and reward systems within an organization.

ECON 5213* Introduction to Econometrics. Prerequisite(s): STAT 3013 or equivalent; consent of instructor. Introductory course in econometric regression analysis for first year graduate students in economics, business and agricultural economics. A review of basic probability and statistics, linear regression with one or more explanatory variables, binary dependent variables regression, instrumental variables regression, the use of panel data, and program evaluation. Assessment of the internal validity of estimated models.

ECON 5223* Mathematical Economics I. Prerequisite(s): 3113 and MATH 2163 or equivalent. Mathematical concepts of single variable and multivariate calculus, topological properties of Euclidean space, convergence, linear algebra, optimization theory and the Kuhn-Tucker Theorem with applications from economic theory.

ECON 5263* Introduction to Econometrics II. Prerequisite(s): 5213 or equivalent; consent of instructor. This is a continuation of 5213. Introductory course in econometric regression analysis for first year graduate students in economics, business and agricultural economics. Topics include microeconomic applications using panel data, qualitative choice and limited dependent variable models. Also, includes applications in macroeconomics and financial economics using regression analysis.

ECON 5413* Economics of the Public Sector I. Allocation and distribution effects as well as incidence of governmental budget policies.

ECON 5433* Economics of the Public Sector II. Fiscal policy as a means of promoting economic stabilization and growth.

ECON 5543* Labor and Personnel Economics. An economic examination of labor markets and the relationship between the firm and the worker. Topics include screening, hiring, and sorting workers, worker signaling and job search, employee motivation and compensation schemes and shared investment in worker training. The course also considers issues related to labor supply and demand, discrimination, job search and unemployment.

ECON 5603* Global Economics. This course presents an introduction to economic issues from a global perspective for the non-specialist. It emphasizes the problems and challenges the process of globalization poses to national economies. The first part of the course presents the major theories of international trade and their relevance to explaining current global trade patterns. The second part of the course examines the foreign exchange market and the process of exchange rate determination. It covers various international financial issues such as current account imbalances, the role of the dollar in international financial markets and international currency crises.

ECON 5703* The Economics of Organization and Competitive Advantage. Prerequisite(s): 3113 or 5113 or consent of instructor. An analysis of organizational architecture (the assignment of decision-making rights, performance evaluation, and reward systems within an organization). An appropriate architecture to give an organization a competitive advantage and to help an organization develop prowess in innovation and reputation, providing other sources of competitive advantage.

ECON 5713* Industrial Organization I. Organization and operation of the enterprise sector of a free enterprise economy; interrelations of market structure, conduct and performance; public policies affecting these elements.

ECON 5723* Industrial Organization II. Alternative market structures and their relationships to market performance; the empirical evidence concerning these. Public policies toward business, including emphasis on U.S. antitrust laws and economic analysis of their enforcement; theories of public utility regulation.

ECON 5733* Energy Economics: Traditional and Renewable Energy. Prerequisite(s): ECON 2103 and either MATH 2103 or MATH 2144. This course examines theory, empirical perspectives, and the political economy of energy supply and demand. It discusses aspects of local, national, and global markets for oil, natural gas, coal, electricity, nuclear power, and renewable energy. In the course, we will examine public policies affecting energy markets including taxes, price regulation, energy efficiency, and control of emissions. Same course as ECON 4113.

ECON 6000* Research and Thesis. 1-12 credits, max 30. Prerequisite(s): Approval of advisory committee. Workshop for the exploration and development of research topics. Research leading to the PhD dissertation.

ECON 6113* Seminar in Economic Policy. 1-3 credits, max 6. Intensive analysis of selected problems in economic policy. Individual research, seminar reports and group discussion of reports.

ECON 6013* Microeconomic Theory I. Prerequisite(s): ECON 5223* or consent of instructor. Contemporary price and allocation theory with emphasis on comparative statics.

ECON 6033* Macroeconomic Theory I. Prerequisite(s): ECON 5033* or consent of instructor. National income, employment and the price level from the point of view of comparative statics.

ECON 6023* Microeconomic Theory II. Prerequisite(s): ECON 6013. Contemporary price and allocation theory with emphasis on general equilibrium analysis. Welfare economics.

ECON 6043* Macroeconomic Theory II. Prerequisite(s): ECON 6033. National income, employment and the price level from the point of view of dynamics. Growth models.

ECON 6113* Seminar in Economic Theory. Microeconomics.


ECON 6213* Econometrics I. Prerequisite(s): ECON 5213* or consent of instructor. Theory and application of econometric theory to regression analysis. Topics include OLS, GLS, nonlinear least squares, and maximum likelihood estimation.

ECON 6233* Time Series Econometrics. Prerequisite(s): 5243 or equivalent. Advanced topics and fundamental elements in economics as well as financial time series models. Recently developed techniques with stationary and nonstationary time series, including Box-Jenkins and forecast methods, unit root, cointegration, error correction model, and VAR.

ECON 6243* Econometrics II. Prerequisite(s): ECON 6213*. Advanced econometric theory and microeconometric applications. Topics include instrumental variables estimation, generalized method-of-moments estimation, limited dependent variable models, regression analysis using cross-section and panel data, and program evaluation.

ECON 6613* International Finance. Prerequisite(s): Permission of instructor. Open macro-economics and the role of devaluation, fiscal and monetary policy in the open economy, monetary approach to the balance of payments, portfolio balance and asset market approaches to the determination of exchange rates.

ECON 6623* Economic Development I. Prerequisite(s): Permission of instructor. Characteristics and problems of less-developed countries. Criteria of growth and development with emphasis on strategies for development. The role of capital, labor, technological progress and entrepreneurship. Growth models.

ECON 6633* International Trade. Prerequisite(s): Permission of instructor. International trade and commercial policy. Comparative advantage, general equilibrium and modern trade theories; welfare implications of international resource allocation models; the theory of protection and international interdependence.

ECON 6643* Economic Development II. Prerequisite(s): Permission of instructor. Major problems of development policy. Inflation and mobilization of capital, investment criteria, agriculture, foreign trade, population and manpower, planning and programming methods.

ECON 6903* Regional Economic Analysis and Policy. Prerequisite(s): Permission of instructor. Selected topics in location theory, regional economic growth and policies toward regional development in the U.S.

ECON 6913* Urban Economics. Prerequisite(s): Permission of instructor. The urban area as an economic system. Problems of economic policy in urban environment.

Education (EDUC)

EDUC 1111 First Year Seminar. Lab 1. Study of the profession of education with emphasis on the skills, qualities and student support services available throughout the campus.

EDUC 2000 Special Topics in Education. 1-3 credits, max 3. Specialized readings in education.

EDUC 2510 Innovative Education Studies. 1-3 credits, max 6. Designed to meet unique or special needs of individuals involved in education. Topics include contemporary approaches to meeting educational challenges on the professional as well as the personal classroom experience. Graded on a pass-fail basis.

EDUC 3680 International Experience. 1-18 credits, max 36. Prerequisite(s): Consent of the associate dean of the college. Participation in a formal or informal educational experience outside of the USA.
EDUC 3090 (I) Study Abroad. 1-18 credits, max 18. Prerequisite(s): Participation in an OSU reciprocal exchange program, consent of the Study Abroad office, and associate dean of the college. Participation in a formal study abroad program in which a semester or year is spent in full-enrollment at a university outside the U.S. 1-3 credits, max 3. Prerequisite(s): Admission to the College of Education’s Honor Program. Individualized directed study approved by a sponsoring professor or Honors coordinator.

EDUC 4050 Honors Colloquium. 1-9 credits, max 9. Prerequisite(s): Consent of instructor or honors coordinator. Study of an interdepartmental and interdisciplinary nature of various important issues and aspects related to the field of education. Provides an intellectual challenge for the able student with a strong dedication to scholarship.

EDUC 4110 Professional Education Seminar. 1-6 credits, max 6. Problems, trends, and pertinent education issues. May include simulation, small-group instruction and field-based experiences. For the pre-service or in-service level.

EDUC 5110 Contemporary Educational Issues. 1-6 credits, max 6. Contemporary and current issues in the broad field of education. May include television interaction, small group discussion and outreach and field experiences. Written reports required. Graded on a pass-fail basis.

EDUC 5910* Educational Field Experiences. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Guided field experience appropriate to a specific program in study. Field experience preceded and followed by appropriate on-campus seminars, readings and reports.

EDUC 5993* Instructional Effectiveness in Higher Education. Prerequisite(s): Graduate standing or consent of instructor. For teaching assistants in all areas. The many aspects of teaching in higher education. Both theory, e.g., traditional instructional design and practical applications, e.g., how to create a lecture. Issues related to instructional development, design and community climate, understanding and assessment of students, classroom practices, materials creation for teaching and development of support systems.

Educational Leadership (EDLE)

EDLE 5000* Thesis or Report. 1-10 credits, max 10. Prerequisite(s): Consent of instructor. Master’s students may earn up to two hours of credit for a report or six hours of credit for a thesis. Students working on a specialist’s report may earn a maximum of 10 hours of credit.

EDLE 5203* Foundations of Adult and Continuing Education. Societal trends, issues and institutions which have influenced the development and current status of adult and continuing education. Analyses and critiques of contemporary adult and continuing education activities, materials, and clientele groups served, and their implications for new and existing programs in the field.

EDLE 5253* The Principalship. Prerequisite(s): 5000-level course in school administration or equivalent. Strategies, techniques and solutions used by the principal in the administration and leadership of a public school.

EDLE 5313* Characteristics of Adult Learners. Learning patterns, interests and motivations among adults in a variety of educational settings. Theories of learning and behavior modification for adults, with implications for adult and continuing education programs. Particular attention given to learners in occupational, adult basic, community junior college, extension and proprietary program settings.

EDLE 5323* School Finance. Development of conceptual bases in economics of education, taxation, distribution systems, policy analysis; application to Oklahoma school finance; and introduction to budget development.

EDLE 5353* Instructional Strategies for Adults. An analysis and application of the various techniques and materials available to facilitate the learning process for adults. Concentration on the process of designing effective learning experiences for adults and developing competencies of the facilitators of group and self-directed learning.

EDLE 5473* Supervision of Instruction. Application of modern approaches to instructional supervision through practice in recording and analyzing teacher behavior in actual classroom settings. Clinical and group methods for improving instruction.

EDLE 5720* Education Workshop. 1-4 credits, max 8. Analysis of organizational, administrative, and instructional problems by common schools and higher education personnel.

EDLE 5723* Education Law. Study of the legal framework of education (constitutional law, case law, and Oklahoma law) with emphases on church-state issues, tort liability, teachers’ rights, and student rights.

EDLE 5813* Leadership Theory and Ethical Decision-Making. Developing understanding of leadership theory and issues related to decision-making in educational settings. Exploring leadership and decision-making within an ethical context.

EDLE 5853* Field Studies Internship I. Lab 3. Prerequisite(s): Consent of instructor. Directed internship experiences designed to relate ideas and concepts to problems encountered in education by faculty and administrators.

EDLE 5893* Field Studies Internship II. Lab 3. Prerequisite(s): Consent of instructor. Directed advance internship experiences designed to relate ideas and concepts to problems encountered in educational organizations by faculty and administrators.

EDLE 5953* Developing Educational Organizations. Prerequisite(s): 5813. Understanding and critically analyzing conventional and novel approaches to the climate and governance of schools and higher education.


EDLE 6003* Educational Ideas. Decision-making processes used in educational systems and use of modern technologies for curricular enhancement and professional development.

EDLE 6143* Resources for the Study of Educational Leadership. Introduction to research traditions, tools and processes that are integral to the study of educational leadership.

EDLE 6243* Connecting Theory and Practice in Administering Schools. Application of research findings and theoretical concepts to best practice in administering educational organizations.

EDLE 6343* Problem Solving in School Administration. Identifying and analyzing administrative problems, individually and collectively, in school settings.

EDLE 6353* The Superintendent. 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.

EDLE 6363* Special Topics in School Finance Policy. Prerequisite(s): Admission to the Graduate College and EDLE 5323 or equivalent. Investigation of problems in education finance policy within the interconnected concepts of liberty, equity, adequacy and efficiency.

EDLE 6393* The Human Factor in Administering Schools. Analysis and critique of current issues in school personnel administration such as recruitment, selection, promotion, morale, interpersonal relations and teacher assessment.

EDLE 6423* The Politics of Education. Activities of schools as they relate to the political environment, e.g., voter behavior, change strategies and community power structures.

EDLE 6453* Special Topics in Education Law. Analysis and critique of selected topics in school law relating to public school administration.

EDLE 6483* School Leadership, Culture and Ethics. Prerequisite(s): Admission to the School Administration doctoral program. Ethical dilemmas and leadership are explored. Personal ethics are studied in terms of integrity in leadership roles.

EDLE 6493* School Improvement/Reform. Prerequisite(s): Admission to the School Administration doctoral program. Focus on the theory and practice of school improvement/reform, especially addressing conditions of underachievement and performance gaps among diverse populations. Knowledge and skill related to understanding evaluating, and implementing school improvement/reform practices. Addresses Oklahoma licensure standards related to the provision of effective instructional practices.

EDLE 6603* Organizational Theory in Education. Selected organizational structures and conceptualizations and theoretical frameworks as they relate to organizational behavior and behavior of personnel in organizations.

EDLE 6633* School Leadership and Community Collaboration. Promoting student success, school mission and goals through collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources.

EDLE 6650* Problems in Educational Administration. 1-4 credits, max 8. Special administrative problem in common schools or higher education, e.g., school plant, school/community relations, administration and the instructional programs, attrition and finance.

EDLE 6710* Special Problems. 1-4 credits, max 8. Assists administrators with current recurring or unique problems arising in common schools or in higher education. Emphasizes evaluation and planning related especially to staff, programs and faculty needs.

EDLE 6713* Effective Teaching in College and Universities. Current research and practice about effective college teaching, role of faculty in higher education settings, and development of teaching strategies and lessons for application in college classrooms.

EDLE 6850* Directed Reading. 1-4 credits, max 6. Directed reading for students with graduate standing.

EDLE 6870* Seminar. 1-3 credits, max 9. Topical issues related to administration and/or higher education, including research techniques available to analyze such topics.

EDLE 6883* Internship in Education I. Lab 3. Prerequisite(s): Consent of instructor. Directed internship experiences designed to relate ideas and concepts to problems encountered in education by faculty and administrators.

EDLE 6893* Internship in Education II. Lab 3. Prerequisite(s): Consent of instructor. Field experiences in a variety of educational work settings.

EDLE 6910* Practicum. 1-5 credits, max 9. Prerequisite(s): Consent of
instructor. Required of all candidates for the Specialist in Education degree. Designed to help the student carry out an acceptable field study or research problem. Credit given upon completion of the written report.

Educational Psychology (EPSY)

EPSY 1003 Learning to Learn. Learning effective strategies to succeed through online individualized assessment, positive attitude development, habit change, development and self-efficacy and self-regulation. Learning tools include: critical thinking, information skills, questioning, transformational learning, presentation and information use skills. Analyzing class materials, problem solving, creativity, teacher analysis, reflection, developing classroom motivation and appropriate classroom behavior to lead to classroom success.

EPSY 1013 Emotional Skills in Learning Success. Striving for academic excellence through self awareness and growth in areas of social and emotional development. Interpersonal and intrapersonal skills, leadership skills, and self-management skills in the context of emotional intelligence theories.

EPSY 2513 Foundations of Ethical Leadership. Prerequisite(s): 24 hours in good standing; admission into the UGCL or consent of instructor. Introduces students to a variety of theoretical views of ethics and leadership studies through the identification of contemporary ethical challenges and the development of foundational leadership skills to meet those challenges. (Same course as HESA 2513)

EPSY 3063 Creative Processes and Problem Solving. Interrelationships of multiple creative processes to find, probe, and solve problems in learning, teaching, and advancing a diverse society.

EPSY 3110 Educational Psychology Seminar. 1-3 credits, max 3. Problems, trends, contemporary topics, and pertinent issues in educational psychology. Concentrated study of selected areas not usually addressed in the undergraduate curriculum.

EPSY 3113 Psychological Foundations of Childhood. The child from conception to puberty with focus on educational implications of development in cognitive, affective and psychomotor domains.

EPSY 3213 Psychology of Adolescence. The adolescent from pubescence to adulthood with focus on educational implications of development in cognitive, affective and psychomotor domain.

EPSY 3413 Child and Adolescent Development. The person from conception through adolescence with focus on education implications of development in cognitive, affective, social, and physical domains.

EPSY 3513 Behavior Management for Teachers of Diverse Learners. Comprehensive and practical introduction to classroom management for diverse learners. Avoidance of behavioral problems through planning, organization and class management; group management procedures to promote positive learning environments, individualized management for specific behavior problems are addressed.

EPSY 3523 Response to Intervention (RtI): Responding to At-Risk Learners. Focus on innovative practices, assessments, treatments, and prevention of academic and behavioral problems. Students will develop skills in the areas of academic assessment, differentiated instructional techniques, intervention/treatment of learning problems, and the use of data to drive instructional decisions for enhancing student outcomes.

EPSY 3533 Motivating Learners. Current practices in learner motivation, school age through developing positive attitudes and building community in class rooms to stimulate motivation of all learners.

EPSY 4063* Exploration of the Creative Experience. The creative experience in art (visual to performing), articulation (oratory to literature), thought (philosophy to psychology), business (practices to products), leisure (procreation to recreation), Western and Eastern viewpoints. Personal creative development fostered by modeling and by investigation of proven techniques. A wide range of creative endeavor with an experiential approach. Future-oriented applications.

EPSY 4223 Human Learning in Educational Psychology. Instructional psychology focusing on the study of teaching and learning theory as part of an instructional processes, and deal with individual, cultural, and environmental differences. Case studies and group discussion emphasizing motivation, planning, evaluation, classroom problems and management.

EPSY 4503 Ethical Leadership for the Common Good. Prerequisite(s): EPSY 2513 or HESA 2513. Builds on foundational model of ethical theory and leadership studies through application of ethical theory and leadership skills to specific contexts and evaluation of their results. (Same course as HESA 4513)


EPSY 4533 Competency Motivation. Development of competence through the application of research strategies in achievement motivation. Examines intellectual ability, motives, goals, attributes, competence perceptions and values as they relate to developmental issues, demographics, contextual influences, culture, and self-regulation.

EPSY 5000* Master's Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of advisory committee chairperson. Report of research conducted by a student in the master's program in school and educational psychology. Credit given and grade assigned upon completion and acceptance of the thesis.

EPSY 5001* Colloquium: Educational Psychology. Prerequisite(s): Admission to graduate program in educational psychology or consent of instructor. Discussion of issues related to graduate study in educational psychology and related fields. Meets once each month (fall 5 times, spring 6 times) for approximately 3 hours. Required for students admitted to the PhD. program in educational psychology during their first year of enrollment. Master’s students strongly encouraged to enroll on a Pass/Fail basis only.

EPSY 5023* Introduction to School Psychological Service. Prerequisite(s): Admission to school psychology or school psychology program or consent of instructor. History, role and function, and issues and problems of the school psychological service worker.

EPSY 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.

EPSY 5103* Human Development in Psychology. Introduction to basic research and theories of cognitive, emotional and social development. Applications to educational and family settings.

EPSY 5113* Child Psychopathology. Prerequisite(s): 5103 or equivalent; enrolled in school psychology, counseling psychology or clinical psychology program or consent of instructor. Survey of theoretical and conceptual issues related to etiology, assessment and treatment of childhood psychopathology. Educates on empirical and clinical taxonomic systems compared and contrasted.

EPSY 5163* Counseling Techniques for Teachers of Gifted and Talented Students. 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-concepts, social and emotional concerns, problem solving and decision-making, referral procedures and self analysis for teachers related to teaching and learning philosophy and style.

EPSY 5183* Theories of Social Psychology. Prerequisite(s): Permission of instructor. History, theories, and empirical findings regarding the interactions between individual and group functioning.

EPSY 5210* Introductory Practicum in School Psychometry. 2-6 credits, max 6. Prerequisite(s): Admission to school psychology program and consent of instructor. Various roles and functions of school psychologists; supervised experience with and shadowing of psychological service delivery activities, introduction to science-based child learner success orientation and professional identity as school psychologists.

EPSY 5310* Practicum in Child and Adolescent Therapy. 1-6 credits, max 12. Prerequisite(s): 6033 and/or permission of instructor. Practicum offers supervised therapy experience with children, adolescents, and their parents for students in School Psychology.

EPSY 5320* Seminar in Educational and School Psychology. 3-9 credits, max 9. In-depth exploration of contemporary topics in educational and school psychology.

EPSY 5363* Differentiated Curriculum Techniques and Materials for Gifted and Talented. 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.

EPSY 5403* Issues in Adolescent Development. Current issues in adolescent development in an educational context and culture, including self, family, peers, school and work relationships. Gender differences within culture, race and class examined. Current dilemmas explored using critical theory and action research.

EPSY 5463* Psychology of Learning. Application to education of the principles and theories of the psychology of learning.

EPSY 5473* Psychology of Adult Learning. Analysis of the psychological foundation of adult learning both in and out of learning programs across the lifespan. Differentiates among adults of all ages in terms of practice and performance in a variety of settings, including classroom, community, and work environments. Examines the intellectual, social, cultural, emotional, motivational, and performance components of the psychology of adult learning.


EPSY 5510* Practicum in School Psychology. 2-6 credits, max 6. Prerequisite(s): Admission to school psychology program and consent of instructor. Supervised experience in the schools of psychological service delivery. Assessment, consultation, direct interventions and development of

**EPSY 5603** Developmental Issues in Instruction. Prerequisite(s): Three hours in developmental psychology, educational psychology or consent of instructor. Developmental issues in instruction at all levels from early childhood through adulthood. Specific impacts of developmental stages on the acquisition and retention of cognitive, affective and psychomotor development at various levels and contexts will be examined and applications to instruction will be provided.

**EPSY 5620** Practicum with Exceptional Learners. 1-8 credits, max 8, Lab 1-8. Prerequisite(s): 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.

**EPSY 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.

**EPSY 5713** Transpersonal Human Development. Human development in terms of individual consciousness, focusing on the implications of such extraordinary states of consciousness as those associated with hallucinogenic drugs and mystical religious experience. Integration of psychological and religious interpretations of development. Applications to practical problems in education and psychology.

**EPSY 5720** Educational and School Psychology Workshop. 1-9 credits, max 9. Workshop on various topics related to educational and school psychology.

**EPSY 5753** Psychosocial Assessment of Pre-Schoolers. Relevant issues and challenges associated with the artificial, social and behavioral assessment of preschool children, from the vantage point of recent research, discourse and policy initiatives. The link between assessment and intervention.

**EPSY 5763** Teaching Methods and Techniques for the Gifted and Talented. 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, including independent study, tutoring, correspondence, clustering, mentors, learning centers, resource centers.

**EPSY 5783** Psycho-Educational Testing of Exceptional Individuals. Intensive practice in the selection, administration and interpretation of individual tests, appropriate for exceptional individuals.

**EPSY 5793** Individual Intellectual Assessment of Children and Youth. Prerequisite(s): 5783 or consent of instructor. Intensive study of the Wechsler Scales, the Stanford-Binet, and other selected tests of mental ability. Emphasis and practice in administration, scoring, interpretation. Issues related to report writing and non-discriminatory assessment.

**EPSY 5803** Advanced Intellectual Assessment. Contemporary Theories and Assessment. Intelligence and Cognitive Abilities. Prerequisites: 5763 or equivalent; good standing in school, counseling, or clinical psychology program, or consent of instructor. Examination of contemporary theories of intelligence and cognitive abilities and intelligence to new assessment technology. Appropriate for school, counseling, or clinical psychology students who are already familiar with tests such as the Wechsler Series and the Stanford Binet IV.

**EPSY 5813** Parent and Family Interventions in School Psychology. Prerequisite(s): By consent of instructor only. Empirically-supported, parent-implemented interventions for children and adolescents addressing a variety of home and school problems within the discipline of school psychology.

**EPSY 5853** Applied Behavior Analysis. Intensive study of behavior and analytical principles as they relate to the functional assessment and intervention development with an emphasis on developmental issues. Fundamental theoretical and practical issues, procedures, and findings applied behavior analysis in educational and related psychology specialties.

**EPSY 5863** Developing Programs for the Gifted and Talented. 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.

**EPSY 5873** Applied Behavior Analysis II. Prerequisite(s): EPSY 5853. A continuation of EPSY 5853. Using the Principles of Behavior Analysis currently applied to school, agency and home settings with an emphasis on school based concerns. Systematic assessment of behavior, intervention development, implementation and evaluation as well as the integration of these components into a single model of consultation.

**EPSY 5963** Developing Resources to Support Educational Programs. Development, management and evaluation of programs in intra- and extra-class settings. Program types include parent, volunteer, mentor, tutor, group sponsors in technology, business involvement, curricular enhancement and service learning. Developing community and business interest through public relations, financial development, grantsmanship or resource information sources. Developing Internet resources to support learners.

**EPSY 5993** Identification and Behavior Characteristics of the Gifted and Talented. Cognitive, affective, and behavioral characteristics of the gifted and talented. Selection of tests and interest inventories. Selection and/or developing of nomination/recommendation forms/models, inventories, checklists, rating scales, sociograms as well as data abstraction from cumulative and anecdotal records. Functions of gifted/talented identification committees.

**EPSY 6000** Doctoral Dissertation. 1-25 credits, max 25. Prerequisite(s): Consent of advisory committee chairperson. Research on a topic selected by a student and the doctoral program committee. Credit given and grade assigned upon completion and acceptance of the doctoral thesis.

**EPSY 6030** Doctoral Seminar in School Psychology. 3-6 credits, max 6. Prerequisite(s): 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.

**EPSY 6033** Introduction to Psychotherapy with Children and Adolescents. 3 credits. Prerequisite(s): 5113. Development of individual and group skills in therapy with children and adolescents. Applications of theories of psychotherapy to a variety of disorders and coping skills, crisis intervention and adaptive social skills training.

**EPSY 6043** Adult Development. Theory and research concerning human development during the adult years. Practical applications for serving adult populations in education and education-related settings.

**EPSY 6063** Research Applications with Q Methodology. Research applications using qualitative and quantitative and Q methodology and abductive reasoning explored with a limited research project. Professional research skills, including ethics, process, team research and manuscript development.

**EPSY 6110** Seminar in School Psychology. 1-3 credits, max 6. An assessment of psychological techniques applied to problems encountered in the internship.

**EPSY 6113** Child Personality Assessment. Prerequisite(s): Admission to school psychology or counseling psychology program, or consent of instructor. The personal and social assessment of children using objective and projective techniques.

**EPSY 6133** History and Systems of Psychology. History and systems of psychology related to contemporary applied psychology.

**EPSY 6143** Introduction to Developmental Psychopharmacology. Prerequisite(s): Graduate student in School of Applied Health and Educational Psychology, or psychology; or 5103, or equivalent, or consent of instructor. Introduction to biological basis of behavior and behavior disorders. Review of the biological systems associated with psychopharmacological treatments. Major drug classes and their role in the treatment of developmental psychopathology.

**EPSY 6153** Advanced Research in Educational Psychology. Prerequisite(s): Admission to doctoral program in Educational Psychology (School, Educational, Counseling, REMS Options). Research in educational psychology in areas such as philosophy of science, issues in basic and applied research in psychology, research ethics, advanced quantitative and qualitative research design. Preparation of the dissertation and grant proposals and dissemination of research.

**EPSY 6163** Emotion and Cognition. 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.

**EPSY 6210** Internship in School Psychology. 3-6 credits, max 12. Prerequisite(s): Admission to school psychology program; completion of all course work; completed readiness for internship form and approval of school psychology faculty. Supervised field experience of non-doctoral school psychology psychologists by certified school psychologists for a maximum of 1200 hours over the course of an academic year, or half-time for two years.

**EPSY 6213** Advanced Educational Psychology. Prerequisite(s): Three hours in developmental psychology or consent of instructor. Learning and its effect upon coping and adjustment. How learning, environmental and personality factors interact to change human behavior.

**EPSY 6253** Single Case Designs in Behavior Analytic Settings. Prerequisite(s): Permission of Instructor or Admission into School Psychology Program. Use of single case designs in behavior analytic settings to validate treatments to increase pro-social behaviors. This includes multiple baseline, multi-element, alternating treatment, and reversal designs.

**EPSY 6310** Doctoral Practicum in School Psychology. 1-6 credits, max 6. Prerequisite(s): 5110 and consent of instructor. Clinical practicum for doctoral students in school psychology. Supervised experiences in assessment, consultation, intervention and supervision activities in a non-school setting.

**EPSY 6313** Advanced Interventions for Increased Academic Achievement. Advanced intervention design with an emphasis on using
behavior analytic approaches to increase achievement in teaching, math, and written expression.

EPSY 6323* Psychological Consultation. Prerequisite(s): Admission to graduate program in the SAHEP 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/lable approach. (Same course as CPSY 6323, students can receive credit in only one of the courses)

EPSY 6333* Instructional Assessment and Consultation. Prerequisite(s): Admission to College of Education or psychology program; or consent of instructor. Development of skills in consulting with educational and agency personnel and families regarding academic and educational functioning. Systematic curriculum-based assessment and measurement techniques as well as planning, implementing and evaluating instructional interventions. Evaluation of the instructional environment.

EPSY 6343* Behavioral Assessment and Consultation. Prerequisite(s): 5113 or equivalent; admission to school psychology, clinical psychology or counseling psychology program; or consent of instructor. Development of psychological skills in systematic behavioral assessment and consultation with application to school, agency and home settings. Systematic behavioral observation, data collection and intervention design, implementation and evaluation.

EPSY 6443* Theories and Problems in Educational Psychology. Prerequisite(s): Admission to the doctoral program in educational psychology or consent of instructor. Theoretical foundations and nature of the problems studied in educational psychology: current issues and historical overview.

EPSY 6460* Internship in Educational Psychology. 1-9 credits, max 9. Prerequisite(s): 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 their first semester. Consists of each new teaching assignment. Includes cooperative planning and evaluation.

EPSY 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.

EPSY 6610* Doctoral Internship in School Psychology. 3-6 credits, max 6. Prerequisite(s): Admission to school psychology doctoral program, completion of all course work; readiness for internship form, approved by school psychology faculty. Supervised experience of doctoral school psychologists for final preparation to enter the profession of school psychology. Designed to fulfill requirements of APA and State Board of Examiners of Psychologists.

EPSY 6613* Instructional Systems Design. A practically-oriented coverage of analyzing, defining, sequencing and validating instructional systems. Developing educational objectives, course development, matching instruction to individual differences and evaluation of systems. Techniques of developing and validating instructional content.

EPSY 6850* Directed Readings in Educational and School Psychology. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Directed reading for students with advanced graduate standing in educational and school psychology.

EPSY 6880* Internship in Education. 1-8 credits, max 8. Lab 3-24. Prerequisite(s): Admission to advanced graduate program and approval of area coordinator. Directed off-campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

Educational Technology (EDTC)

EDTC 3123 Applications of Educational Technologies. Introduction to the design and development of instruction using educational media and technology. Materials development, contemporary applications of computers and other electronic systems to instruction. Integration of instructional design, instructional media, and instructional computing. May not be used for degree credit with EDTC 4113.

EDTC 4113 Applications of Media and Technology. Introduction to the application of media and technology to formal and informal learning situations. Intended for non-professional education majors. May not be used for degree credit with EDTC 3123.

EDTC 5000* Master’s Report or Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. 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.

EDTC 5053* Learning in a Digital Age. Foundational understanding of digital learning including history, definitions, common assumptions, cultural competence, ethical issues, standards, methods, and models to maximize digital learners’ experience in educational and corporate settings.

EDTC 5103* Advanced Computing Applications in Education. In-depth exploration of advanced technology use in teaching and learning environments. Examination of current issues of technology use in instructional settings.

EDTC 5113* Digital Media Production for Instruction. Introduction to the production of digital media for instruction. Topics covered: Instructional design for digital media, message design, use of graphics, multimedia development tools. Current research, trends, tools and issues in media production will also be addressed.

EDTC 5153* Computer-Based Instructional Development. 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.

EDTC 5203* Foundations of Educational Technologies. A general introduction to the field of Educational Technology. Define, describe, and critically evaluate the foundations, issues and careers in educational technology.

EDTC 5303* Digital Games and Simulations in the Classroom. Introduces students to the philosophies, theories, processes and practices of integrating digital games and simulations into the classroom.

EDTC 5403* Creativity and Innovation in Educational Technology. In-depth examination of a variety of innovation technologies and engagement in pedagogies and technologies associated with creativity, innovation and invention.

EDTC 5503* Facilitating Online Learning. Apply knowledge of pedagogy, standards for online teaching, online community building, and teaching with technology to design and facilitate online learning environments.

EDTC 5720* Education Workshop. 1-8 credits, max 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.

EDTC 5753* Introduction to Instructional Design. Introduction to the systematic design of instruction. Topics covered: Analysis, design, development, implementation, and evaluation of instructional materials in a variety of educational settings. Current research, trends and issues in instructional design will be addressed.

EDTC 5773* Instructional Systems Management. Principles of management relevant to instructional systems, including, but not limited to: project, resource, quality, change, financial, information technology, human resource, program evaluation, product, knowledge and performance management.

EDTC 5850* Directed Study. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Directed study for master’s level students.

EDTC 6000* Doctoral Dissertation. 1-15 credits, max 15. Required of all candidates to the Doctor of Education degree. Credit is given upon completion of the thesis.

EDTC 6153* Advanced Computer-Based Instructional Development. Prerequisite(s): 5153 or consent of instructor. Design of user-friendly instructional interfaces and computer-based learning management systems.

EDTC 6283* Performance Improvement Technology. Overview of performance improvement, as defined within the field of Educational Technology. Training and non-training interventions to improve performance in learning situations. Sample topics may include needs assessment, motivation systems, compensation systems, job aids, or electronic performance support systems.

EDTC 6333* Human Computer Interaction. Prerequisite(s): 5153 or consent of instructor. Human cognitive architecture, information processing, and design of effective educational, computer-based interfaces.

EDTC 6423* Trends and Issues in Educational Technology. Selected problems, issues and trends in educational technology.

EDTC 6553* Media and Learning in Educational Technology. Exploration of topics from media studies relevant to educational technology, especially online learning. Reading of classic works in media studies in tandem with related contemporary works addressing new developments in educational technology, online learning, online gaming, and social media for learning.

EDTC 6850* Directed Reading. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Directed reading for students with advanced graduate standing to enhance students’ understanding in areas where they wish additional knowledge.

EDTC 6880* Internship in Education. 1-6 credits, max 8. Prerequisite(s): Consent of instructor. Directed off campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

EDTC 6910* Practicum. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Helps the student carry out an acceptable research problem (practicum) in a local school situation. Credit given upon completion of the written report.

Electrical and Computer Engineering (ECEN)

ECEN 3020  Supervised Research Project. 1-3 credits, max 3. Prerequisite(s): Consent of instructor and ECEN department head. Supervised research project for qualified students. May be repeated no more than three times for a total of three credit hours.

ECEN 3113  Energy, Environment and Economics. Prerequisite(s): 3513 and admission to Professional School. Topics relevant to understanding the close relationship between energy use, its impact on the environment, and overall economic implications. Green energy technologies (wind, solar, hydro) will be considered along with conventional techniques. Both conventional and non-conventional energy systems and policies will be discussed.


ECEN 3314  Electronic Devices and Applications. Lab. 2. Prerequisite(s): 3511, 3716, degree program requires admission to Professional School prior to enrollment. Semiconductor electronic components including MOSFETs, BJTs, JFETs, and OpAmps. 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. Theoretical concepts and methods are demonstrated and reinforced through laboratory exercises.


ECEN 3613  Electromagnetic Fields. Prerequisite(s): ENSC 2613, MATH 2103 and MATH 2233. Time-harmonic and transient response of transmission lines. Maxwell's equations and their applications to engineering problems in electrostatics, magnetostatics, time-harmonic fields and plane wave propagation.

ECEN 3623  Mathematical Foundations of Electromagnetics and Photonics. Lab. 2. Prerequisite(s): 3613; degree program requires admission to Professional School prior to enrollment. Mathematical and computational treatment of fundamental electromagnetic theory, with applications to microwave engineering, photonics and semiconductor design. Energy and power; Laplace and Poisson equations; wave equation, including reflection, refraction, and diffraction; and classical electromagnetic radiation at macroscopic and microscopic levels.

ECEN 3714  Network Analysis. Lab. 2. Prerequisite(s): 2011, ENSC 2613, MATH 2233. Laplace transform, transfer functions, magnetically coupled circuits and two-port networks. Theoretical concepts and methods are demonstrated and reinforced through laboratory exercises.

ECEN 3723 Systems I. Prerequisite(s): ENSC 2113, 2613, MATH 2233. Physical and mathematical modeling of electrical and mechanical dynamic systems. Transient response of first and second order systems. Laplace transform techniques for solving differential equations, transfer functions, frequency response and resonance.

ECEN 3903 Introduction to Semiconductor Devices. Prerequisite(s): PHYS 2114 or equivalent. Crystal structure, the quantum theory of solids. The physics of semiconductor materials and the junction, with an emphasis on applications to semiconductor devices. (Same course as PHYS 3313)


ECEN 4010** Technical Problems and Engineering Design. 1-12 credits, max 12. Prerequisite(s): 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.

ECEN 4013 Design of Engineering Systems. Lab. 4. Prerequisite(s): 2011, 3714, 3314, 3233 and ENSC 3323 and ENGL 3323 as a co-requisite. 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.

ECEN 4024 Capstone Design. Lab. 2. Prerequisite(s): ECEN 4013; degree program requires admission to Professional School prior to enrollment. Continuation of ECEN 4013. Student project teams design, build, test and present results for realistic industrial or university projects. Formulation of specifications, consideration of alternative solutions, feasibility considerations, detailed system descriptions, economic factors, safety, reliability, aesthetics and social impact.

ECEN 4030 Undergraduate Professional Practice. 1-8 credits, max 8. Prerequisite(s): Approval of ECEN department head. Experience in application of electrical engineering principles to typical problems encountered in industry. Solutions to the problems by student participation in the role of engineer or engineering intern.

ECEN 4133* Power Electronics. Prerequisite(s): Degree program requires admission to Professional School prior to enrollment. Power electronic devices, components, and their characteristics; DC to AC conversion; fundamentals of inverters and waveshaping devices; application aspects; control aspects; characteristics and state-of-the-art of advanced power inverter and power conditioning topologies.

ECEN 4153* Power System Analysis and Design. Prerequisite(s): Degree program requires admission to Professional School prior to enrollment. Power system component models from circuit theory. Formulation and design of the load flow model and the optimum economic generator allocation problem utilizing optimization techniques. Design and implementation of power system protection.

ECEN 4213* Embedded Computer Systems Design. Prerequisite(s): ENSC 3213 and CS 1113. Degree program requires admission to Professional School prior to enrollment. Design of microprocessor-based systems through proper integration of hardware and software. Serial and parallel communications, sensor interfacing, computer control of external devices, and color graphics hardware. Design of PASCAL and assembly language modules for optimum real-time system performance.

ECEN 4233* High Speed Computer Arithmetic. Prerequisite(s): ENSC 3233; degree program requires admission to Professional School prior to enrollment. Course covers computer arithmetic as applied to general purpose and application-specific processors. Focus is on developing high-speed arithmetic algorithms and understanding their implementation in VLSI technology at the gate level.

ECEN 4243* Computer Architecture. Prerequisite(s): ENSC 3213 and ENSC 3233. Degree program requires admission to Professional School prior to enrollment. 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. (Same course as CS 4273)

ECEN 4283* Computer Networks. Prerequisite(s): ENSC 3213 or CS 3443. Degree program requires admission to Professional School prior to enrollment. Computer networks, distributed systems and their systematic design. Introduction to the use, structure, and architecture of computer networks. Networking experiments to describe network topology, ISO reference model. (Same course as CS 4283)

ECEN 4303* Digital Integrated Circuit Design. Prerequisite(s): 3233 and 3314; degree program requires admission to Professional School prior to enrollment. Theory of digital and electronics circuits. Digital logic families TTL, IL, ECL, NMOS, CMOS, GaAs. Large signal models for transistors. Implementation at RAM and ROM. Circuit design for LSIs and VLSIs.

ECEN 4313* Linear Electrical Circuit Design. Prerequisite(s): 3314; degree program requires admission to Professional School prior to enrollment. 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 mathematical modeling of electronic devices, design and analysis of wide-band amplifier circuitry.

ECEN 4353* Communication Electronics. Prerequisite(s): 3314; degree program requires admission to Professional School prior to enrollment. Design of tuned voltage and power amplifiers, oscillators and mixers, modulation and detection, and parametric amplifiers.

ECEN 4413* Automatic Control Systems. Prerequisite(s): 3723 or MAE 3723; degree program requires admission to Professional School prior to enrollment. Design of tuned voltage and power amplifiers, oscillators and mixers, modulation and detection, and parametric amplifiers.


ECEN 4523* Communication Theory. Prerequisite(s): 3513 and ENSC 4503; degree program requires admission to Professional School prior to enrollment. Noise in modulation systems. Digital data transmission. Design of optimal receivers. Introduction to information theory.

ECEN 4533* Data Communications. Prerequisite(s): ECEN 4503 as co-requisite. Degree program requires admission to Professional School prior to enrollment. Signal detection and signal-to-noise ratio and rate of information transfer. Transmission multiplexing and error correction techniques.
Prerequisite(s): 3613; degree program.

Lab 2. Prerequisite(s): PHYS 2114; Techniques and Energy conversion techniques.

Prerequisite(s): 4413.

Prerequisite(s): 5713 Linear Systems.

1-6 credits, max 6. Prerequisite(s): Consent of instructor.

Prerequisite(s): 4243 or graduate standing.

Prerequisite(s): 4763 or MAE 4053. Failure of superposition of effects; phase-plane analysis; limit-cycles; Lyapunov stability; hyperstability and input-output stability; controllability and observability of nonlinear systems; system security. Applications to systems other than power systems included. For engineers are engaged and modeling approaches are implemented.

ECEN 4823*  Design of Optical Systems.

Lab 2. Prerequisite(s): PHYS 2114; degree program requires admission to Professional School prior to enrollment. Introduction to optics through the design, construction, and characterization of optical systems. Emphasis on geometrical optics and spectroscopy.

ECEN 4843*  Design of Lasers and Systems.

Lab 2. Prerequisite(s): 3613; degree program requires admission to Professional School prior to enrollment. Introduction of the design of lasers and optical systems based on lasers including the design, construction, and characterization of lasers. Gaussian beams, geometrical and optical properties, advanced topics, lasers in industry and 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.

ECEN 5000* Thesis or Report.

1-6 credits, max 6. Prerequisite(s): Approval of major professor. A student studying for the master's degree will enroll in this course for a maximum of six credit hours.

ECEN 5030* Professional Practice.

1-8 credits, max 8. Experience in application of electrical engineering principles to typical problems encountered in industry. Preparation for graduate engineering design and development projects. Introduction to 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 CS 5253)

ECEN 5233*  Embedded Sensor Networks.

Prerequisite(s): Graduate standing or consent of instructor. Analysis and design of wireless networks, including the integration of sensing, computation, and wireless communication within an embedded system. Mobile sensor networks and body sensor networks. Real world application and new innovations.

ECEN 5253* Digital Computer Design.

Prerequisite(s): 4243 or graduate standing. 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 CS 5253)

ECEN 5263*  VLSI Digital Systems Design.

Prerequisite(s): 4303; 5253 recommended or graduate standing. Design of very large-scale digital systems on a single chip. Review of MOS technology. Design rules imposed by fabrication structures. Systematic design techniques for control and data flow; system timing; highly concurrent systems. Experimental opportunities available.

ECEN 5283*  Computer Vision.

The development of machine vision and advanced image understanding techniques for robotics, automated inspection, biomedicine. Object recognition, motion analysis, object tracking, segmentation, and 3-D analysis.


Prerequisite(s): PHYS 3114 and 3133 or equivalent. Smith chart, single- and multi-port network, filter design, RF/ microwave components and modeling, matching and biasing network, amplifier, mixer, detectors, and oscillators.

ECEN 5353* Advanced Power Electronics.

Prerequisite(s): 4313. Characteristics of high power semiconductor devices and the application of such devices to power conditioning, inversion and wave shaping at high power levels.

ECEN 5363*  CMOS Analog Integrated Circuit Design.

Prerequisite(s): 4313. Advanced study of solid state CMOS linear integrated circuits. Topics include: Op Amps, comparators, multipliers, D/A and A/D converters and Op Amp building blocks. Op Amp building blocks include, differential pairs, current mirrors, output stages, and references. VLSI layout and circuit simulation using SPICE.

ECEN 5373* RF Microwave Circuit Design.

Prerequisite(s): 3314 , 4813 and 5333 or equivalent. Smith chart, single- and multi-port network, filter design, RF/ microwave components and modeling, matching and biasing network, amplifier, oscillators and mixers.

ECEN 5413*  Embedded Sensor Networks.

Prerequisite(s): 5713 or MAE 5713. Optimal control theory for modern systems design. Specification of optimum performance indices. Dynamic programming, calculus of variations and Pontryagn's minimum principle. Iterative numerical techniques for trajectory optimization. (Same course as MAE 5413)

ECEN 5423* Control of Hybrid Systems.

Prerequisite(s): 5713 Linear Systems or consent of instructor. Introduction and definitions. Modeling of hybrid systems. Analysis of hybrid systems. Stability analysis. Switched control systems. Hybrid control design. Applications in power systems, robotics, transportation and manufacturing systems. Control and timing systems; microprogramming; memory organization alternatives; input/output interfaces. (Same course as MAE 5433)

ECEN 5433* Robotics Kinematics, Dynamics and Control.

Prerequisite(s): 4413 or MAE 4053 or consent of instructor. Kinematic and dynamic analysis of robot manipulators. Inverse kinematics, motion planning and trajectory generation. Industrial practice in robot servo control. Dynamics and control in the presence of constraints. Actuators and sensors. Force sensors and vision systems. Robotic force control and its applications in industry. Passivity-based control algorithms. Advanced control techniques for motion and force control. (Same course as MAE 5433)

ECEN 5463* Nonlinear System Analysis and Control.

Prerequisite(s): 4413 or MAE 4053. Failure. Superposition of effects: phase-plane analysis; limit-cycles; Lyapunov stability; hyperstability and input-output stability; controllability and observability of nonlinear systems; feedback linearization; robust nonlinear control system design. (Same course as MAE 5463)

ECEN 5473* Digital Control Systems.

Prerequisite(s): 4413 or MAE 4053. Input-output and state-space representation of linear discrete-time systems. Approximate methods in discrete-time representation. Stability methods.
ECEN 5483* Advanced Mechatronics Design. Prerequisite(s): MAE 4733 or similar course and consent of instructor. Optimizing C programming code for microcontrollers using the assembly language instruction set. RS-232 microcontroller communication protocol. Controller Area Network (CAN) communication protocol plus hands-on CAN bus development boards, advanced topics which could include but are not limited to sensor design, real-time operating systems, and advanced communication protocols. Same course as MAE 5483.

ECEN 5493* Software Design for Real-Time Distributed Systems. Prerequisite(s): 483 or MAE 483 or consent of the instructor. Fundamental concepts associated with the design of software for implementation on distributed computing systems are discussed. Topics include: real-time modeling and simulation in a real-time environment and control algorithm design. State-of-the-art systems including analog-to-digital and digital-to-analog equipment and newest computer-aided software engineering tools.

ECEN 5513* Stochastic Systems. Prerequisite(s): 3513 and 4503 or STAT 4033. Theory and application involving probability, random variables, functions of random variables, and stochastic processes, including Gaussian and Markov processes. Correlation, power spectral density, and non-stationary random processes. Response of linear systems to stochastic processes. Space-state formulation and control system analysis. (Same course as MAE 5513)

ECEN 5523* Estimation Theory. Prerequisite(s): 5513 or MAE 5513. Stochastic model development, parameter estimation and state estimation. The linear model, model order determination, least squares estimation, maximum likelihood estimation, Bayesian estimation. Gaussian random vectors, estimation in linear, and Gaussian models, state estimation, the Kalman filter, prediction and smoothing. (Same course as MAE 5523)

ECEN 5533* Modern Communication Theory. Prerequisite(s): 5513. Noise as a random process, analog and digital signal detection in the presence of noise, optimum receiver design using signal space concepts 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 computer communication networks.

ECEN 5543* Data Transportation and Protection. Data and its representation; finite field matrices, pseudorandom sequences, information protection; space division networks; synchronization, and channel and error control.

ECEN 5553* Telecommunications Systems. Prerequisite(s): Graduate standing or consent of instructor. Survey the ways and means that voice, data and video are moved long distances. Covers computer networks (Ethernet LAN’s, Internet WAN’s); telephone systems (PSTN, VoIP and cellular telephony); video (MPEG, H.323, and IPTV); and last mile delivery systems.

ECEN 5563* Principles of Wireless Networks. Prerequisite(s): 4283 or CS 4283. Wireless network operation, planning, mobility management, cellular and mobile data networks, ad hoc networks, Bluetooth, power management, wireless geolocation and indoor positioning technique. (Same course as CS 5813)

ECEN 5573* Wireless Communication. Wireless channel characterization: large-scale and small scale fading. Techniques to combat fading: diversity techniques, coding techniques, CDMA, OFDM, MIMO. Elementary digital signal processing, digital signal encoding and decoding, wireless networks, and internet protocol. (Same course as CS 5873)


ECEN 5623* Antenna Theory. Prerequisite(s): 3613. Fundamental antenna parameters, including directivity, efficiency, radiation resistance, and pattern. Analysis of dipole, loop, aperture, broad-band, and traveling wave antennas. Array theory. Introduction to numerical techniques used in modern antenna design.


ECEN 5653* Biomedical Optics. Biomedical optics, also often termed as biophotonics, is highly interdisciplinary subject on applying light for diagnostic detection and manipulation of biological tissue. This course introduces fundamental concepts and principal technologies of biomedical optics or biophotonics to graduate students and upper-level undergraduate students. The course includes three parts: The first part discusses light–tissue interaction. The second part introduces approaches to modeling photon propagation in tissue. The third part covers representative light-manipulating and imaging technologies for probing biological tissues at different spatial, spectral, and temporal scales for either morphological or functional diagnosis. Topics of therapeutic use of light will also be discussed.

ECEN 5703* Optimization Applications. Prerequisite(s): Graduate standing. A survey of various methods and constrained and constrained linear and nonlinear optimization. Applications of these methodologies using hand-worked examples and available software packages. This applications oriented course is intended for engineering and science students. (Same course as CHE 5703, IEM 5023 & MAE 5703)

ECEN 5713* Linear Systems. Prerequisite(s): Graduate standing or consent of instructor. Introduction to the fundamental theory of finite–dimensional linear systems with emphasis on the state–space representation. Mathematical representations of systems; linear dynamic solutions; controllability, observability, and stability; linearization and realization theory; and state feedback and state observer. (Same course as MAE 5713)

ECEN 5733* Neural Networks. Prerequisite(s): Graduate standing. Introduction to mathematical analysis of networks and learning rules, and on the application of neural networks to certain engineering problems in image and signal processing and control systems. (Same course as CHE 5733 & MAE 5733)

ECEN 5753* Digital Processing of Speech Signals. Prerequisite(s): 4763 or 5513. Digital signal processing; discrete Fourier transform; short time analysis and synthesis; the short time Fourier transform, linear predictive coding and solution of the normal equations; vocal tract spectrum calculation; speech coding: homomorphic processing; applications of speech processing, introduction to advanced topics as time permits.

ECEN 5763* Digital Signal Processing. Introduction to discrete linear systems; frequency-domain design of digital filters; quantization effects in digital filters; digital filter hardware, discrete Fourier transforms; high-speed convolution and correlation with application to digital filtering. Introduction to Walsh Fourier theory.

ECEN 5773* Intelligent Systems. Prerequisite(s): 5733. Introduction to the state-of-the-art intelligent control and system successfully deployed to industrial and defense applications. Emerging intelligent algorithms (e.g., NN, FS, GA, EP, DES); intelligent control architecture (e.g., bottom-up, top-down, semiotics); intelligent learning and hybrid systems; and case studies and design projects. (Same course as MAE 5773)

ECEN 5783* Medical Imaging. Prerequisite(s): 3513, 4743, or consent of instructor. A comprehensive introduction to the standard medical imaging modalities used today. Topics include radiation, radiation-interaction with matter, X-ray radiography, ultrasound, computer topography, image reconstruction and analysis, MRI, nuclear medicine, and radiation therapy. The fundamental mathematics underlying each imaging modality is reviewed and the hardware needed to implement each system is examined.

ECEN 5793* Digital Image Processing. Prerequisite(s): 4763 or 5763. Digital image processing including inclusion of fundamentals of transforms, coding and compression, enhancement, restoration and segmentation. Use of modern image processing software on Sun and IBM work stations.

ECEN 5803* Geometrical Optics. Prerequisite(s): PHYS 5213 or consent of instructor. Foundations of geometrical optics, geometrical theory of optical imaging, geometrical theory aberrations, image forming instruments. (Same course as PHYS 5123*)

ECEN 5823* Physical Optics. Prerequisite(s): PHYS 5213 or consent of instructor. Multiple beam interference, diffractions, imaging, near field optical probes of matter, surface plasmons, light scattering from random media, optical coherence topography- biomedical applications, negative materials, perfect lenses and super resolution. (Same course as PHYS 5303)

ECEN 5833* Fiber-Optic Communication Systems. Prerequisite(s): Graduate standing or consent of instructor. Five generations of fiber-optic communication systems described in detail. Technical advances and increased capability of optical systems. Historical development of optical fiber technology, high-speed communication systems with emphasis on the state-space representation. Systems engineering point of view, emphasizing optimization of all components of the optical fiber link.

ECEN 5843* Microelectronic Fabrication. Lab 1. Prerequisite(s): 3314. Contamination control and clean-room, vacuum systems, wafer manufacturing, photolithography and alternative lithographic techniques. Physical and chemical vapor deposition, oxidation, etching, doping, packaging, formation of semiconductor devices and circuits. A series of Fabrication lab projects is conducted starting from bare silicon wafers to fabricate Optoelectronic circuits.

ECEN 5853* Ultrafast Optoelectronics. Prerequisite(s): Graduate standing or consent of instructor. Reviewing ultra fast laser pulses with electronic circuitry. Increased device performance. Optoelectronic/electrical pulses as short as 0.2 psec. High performance areas including the power of advanced techniques in applications.

ECEN 5923* Introduction to MEMS. Prerequisite(s): 5843 or consent of instructor. Fundamentals of Microsystems. Topics include: energy transduction
mechanisms, energy dissipation modeling, energy methods, mechanics of small scale, fabrication process design, micromachining, electronic interface.

**ECEN 6000** Research. 1-16 credits. max 36. Prerequisite(s): Consent of major professor. Independent research for students continuing graduate study beyond the level of the MS degree.

**ECEN 6001** PhD Seminar Series. Prerequisite(s): Approval of ECEN department head. Seminar series for PhD studies and research.

**ECEN 6050** Preliminary PhD Research and Proposal. 3 credits, max. 3. Prerequisite(s): Consent of advisor. Independent research and report of an advanced electrical engineering problem. Work performed serves as foundation of the oral PhD preliminary exam.

**ECEN 6060** Advanced Special Topics. 1-6 credits, max 30. Prerequisite(s): Consent of instructor. Advanced engineering topics not normally included in existing courses. Repeat credit may be earned with different course subtitles assigned.

**ECEN 6070** Advanced Directed Studies. 1-6 credits, max 12. Prerequisite(s): Admission into PhD program and consent of instructor. Investigation outside of the classroom of topics not normally covered in lecture courses.

**ECEN 6123** Special Topics in Power Systems. Prerequisite(s): 5113. Selected relevant current topics related to power system operation and planning.

**ECEN 6253** Advanced Topics in Computer Architecture. Prerequisite(s): 5253 or CS 5253. Innovations in the architecture and optimization of computers, with an emphasis on parallelism. Topics may include pipelining, multiprocessors, data flow, and reduction machines. (Same course as CS 5253)

**ECEN 6263** Advanced VLSI Design and Applications. Prerequisite(s): 5223 and 5283. Designing testable integrated circuits. Specialized parallel processing architectures. Application examples.

**ECEN 6363** Analog VLSI for Signal Processing. Lab 2. Prerequisite(s): 4273. Continuation of 5363. Advanced theory and practice of analog VLSI design methodology. Very large scale design and implementation of signal processing algorithms, including over sampled, signal processing and neural networks and filters.

**ECEN 6423** System Identification. Prerequisite(s): 5473 or 5713 or MAE 5473 or MAE 5713. Linear and nonlinear system modeling of random systems. Models of linear time-invariant systems, nonparametric methods and preliminary model development, parameter estimation methods, convergence and consistency, nonparametric distributions of parameter estimates. Nonlinear modeling. (Same course as MAE 6423)

**ECEN 6453** Adaptive Control. Prerequisite(s): 5473 or 5713 or MAE 5473 or MAE 5713. Analysis and design of control techniques that modify their performance to adapt to changes in system operation. Review of systems analysis techniques, including state variable representations, linearization, discretization, covariance analysis, stability, and linear quadratic Gaussian design. On-line parameter estimation, model reference adaptive systems, self-tuning regulators, stable adaptive systems. (Same course as MAE 6453)

**ECEN 6483** Robust Multivariable Control Systems. Prerequisite(s): 5713 or MAE 5713. Introduction to multivariable system analysis and control. Robustness; multivariable system poles and zeros; MIMO transfer functions; multivariable frequency response analysis; multivariable Nyquist theorem; performance specifications; stability of feedback systems; linear fractional transformations (LFT’s); parameterization of all stabilizing controllers; structured singular value, algebraic riccati equations, H2 optimal control; H-infinity controller design. (Same course as MAE 6483)

**ECEN 6523** Information Theory. Prerequisite(s): 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 waveforms for noise immunity. Information transfer in learning systems.

**ECEN 6803** Photonics I: Advanced Optics. Lab 9. Prerequisite(s): 3813 or PHYS 3213 or consent of instructor. Advanced optics including spectral and time characteristics of detectors, characteristics of lasers, time, spectral and spatial parameters of laser emission, interferometric techniques, and nonlinear effects such as two-photon absorption and second and third harmonic generations. Emphasis on ultrashort laser pulses. (Same course as CHEM 6803 & PHYS 6803)

**ECEN 6810** Photonics II: THz Photonics and THz-TD. 1 credit, max 4. Lab 3. Prerequisite(s): 6803. THz photonics and THz time-domain spectroscopy (THz-TDS). Concepts and techniques of driving electronic circuitry with ultra short laser pulses to generate and detect freely propagating pulses of THz electromagnetic radiation using several operational research systems. (Same course as CHEM 6810 & PHYS 6810)

**ECEN 6820** Photonics II: Spectroscopy I. 1 credit, max 4. Lab 3. Prerequisite(s): 6803. Operating principles and applications of laser spectroscopy of atoms, molecules, solids and complex fluids. Absorption, emission, photon correlation, coherence, time resolved Fourier transform. Raman spectroscopy and non-linear optical. (Same course as CHEM 6820 & PHYS 6820)

**ECEN 6823** Advanced Optical Techniques. Prerequisite(s): 5853. State-of-the-art optical devices and research methodologies. Investigation and discussion of contemporary developments in non-linear optical devices and laser applications. Includes both analytical and experimental techniques.

**ECEN 6830** Photonics II: Spectroscopy III. 1 credit, max 4. Lab 3. Prerequisite(s): 6803. Advanced spectroscopic instruments and methods used for detection of semiconductors and solid state material. Stimulated emission characterized both in wavelength and in time. Time-resolved fluorescence measurements. Multiphoton excitation. Fast measuring techniques, including subnanosecond detectors, picosecond streak cameras, and ultra fast four-wave mixing and correlation techniques. Time-dependent photocconductivity measurements. (Same course as CHEM 6830 & PHYS 6830)

**ECEN 6840** Photonics III: Microscopy I. 1 credit, max 4. Lab 3. Prerequisite(s): CHEM 3553 or consent of instructor. The structure and imaging of solid surfaces. Basics of scanning probe microscopy (SPM), Contact and non-contact atomic force microscopy (AFM). Scanning tunneling microscopy (STM) in air. (Same course as CHEM 6840 & PHYS 6840)

**ECEN 6843** Advanced Microelectronic Fabrication. Prerequisite(s): 5843. Photolithography, wet and dry etching, thermal and electron beam evaporation, photomask design using Layout Edit, silicon devices processing, quartz devices processing, silicon-on-sapphire devices processing. GaAs devices processing and MEMS devices processing.

**ECEN 6850** Photonics III: Microscopy II. 1 credit, max 4. Lab 3. Prerequisite(s): CHEM 3553 or consent of instructor. Advanced techniques of scanning probe microscopy (SPM), Magnetic force microscopy, Kelvin force microscopy, scanning probe microscopy (STM) in vacuum. Characterization of materials with SPM. Nanolithography with SPM. Device manufacturing and analysis. (Same course as CHEM 6850 & PHYS 6850)

**ECEN 6860** Photonics III: Microscopy II and Image Processing. 1 credit, max 4. Lab 3. Prerequisite(s): 6803. Digital image processing, including projects. Image acquisition and display, image enhancement, geometric operations, linear and nonlinear filtering, image restoration, edge detection, image analysis, morphology, segmentation, recognition, and coding/compression. (Same course as CHEM 6860 & PHYS 6860)

**ECEN 6870** Photonics IV: Synthesis and Devices I. 1 credit, max 4. Lab 3. Prerequisite(s): 6803 and 6840. Preparation of functional nanostructures and related optical/electronic devices. Physical and chemical methods of thin film deposition. Engineering of prototypes of light emitting diodes, sensors, optical limits of data storage and photolithographic patterns. (Same course as CHEM 6870 & PHYS 6870)

**ECEN 6880** Photonics IV: Semiconductor Devices, Testing and Characterization. 1 credit, max 4. Lab 3. Prerequisite(s): 6803, 6840. Test and characterization of semiconductor and optoelectronic devices. Hall effect, four probe, CV and IV measurements, optical pumping, photoionization, and spectroscopy. (Same course as CHEM 6880 & PHYS 6880)

**ECEN 6890** Photonics IV: Semiconductor Synthesis and Devices III. 1 credit, max 4. Lab 3. Prerequisite(s): 6803. Processing, fabrication and characterization of semiconductor optoelectronic devices in classes 100/10000 cm. Cleanroom operation including general procedure for material processing and device fabrication. Device processing using a variety of processing such as mask aligner, vacuum evaporators and rapid thermal annealing. Testing using optical and electrical testing apparatus such as I-V, C-V, Hall, and optical spectral measurement systems. (Same course as CHEM 6890 & PHYS 6890)

**ECEN 6900** Photonics IV: Microscopy III. 1 credit, max 4. Lab 3. Prerequisite(s): 6803. Processing, characterization of semiconductor optoelectronic devices in classes 100/10000 cm. Cleanroom operation including general procedure for material processing and device fabrication. Device processing using a variety of processing such as mask aligner, vacuum evaporators and rapid thermal annealing. Testing using optical and electrical testing apparatus such as I-V, C-V, Hall, and optical spectral measurement systems. (Same course as CHEM 6890 & PHYS 6890)

**EET 1003** Introduction to Microcomputer Programming. Lab 2. Co-requisite(s): MATH 1513. Programming a microcomputer using a spreadsheet and in BASIC. Application of algorithms to solve defined problems and an introduction to the numerical limitations of small machines.

**EET 1104** Fundamentals of Electricity. Lab 3. Prerequisite(s): MATH 1513 and consent of department. Elementary principles of electricity covering basic electric units. Ohm’s law, Kirchhoff’s law, circuit solutions, network solutions, magnetism, inductance and capacitance.

**EET 1244** Circuit Analysis I. Lab 3. Prerequisite(s): 1104. Co-requisite(s): MATH 1613. Analysis of AC electric circuits. The use of network theorems and phasor methods. Analysis of coupled circuits, resonant filters, and power systems.

**EET 2303** Technical Programming. Lab 3. Prerequisite(s): 1104, 1104, MATH 1513 or completion of comparable engineering science courses. Introduction to machine programming using industrial standard languages, emphasis on problems from science and technology.

**EET 2544** Pulse and Digital Techniques. Lab 3. Prerequisite(s): 1104. Digital circuits used in microcomputer control and computation. Pulse generation, Basic algebra and logic circuits.

**EET 2635** Solid State Devices and Circuits. Lab 3. Prerequisite(s): 1244, MATH 1613. Diodes, transistors, LSI linear devices; their operation and applications in electronic circuits.

**EET 3005** Electronics Analysis I. Prerequisite(s): 1104, 2544, 2635, MATH 1513, 1613, or equivalent. Co-requisite(s): MATH 2123. Extensive use of mathematics in analyzing discrete linear devices, linear devices and non-linear circuits. Development of the analytic skills necessary for upper-division work. The use of basic calculus in circuit analysis. Must obtain a “C” or
better before admission to other 3000 level EET courses. Intended for transfer and returning students. Enrollment by adviser consent.

EET 3104 Elements of Electricity and Electronics. Lab 3. Prerequisite(s): MATH 1513. Essentials of electricity, controls, and electronics for non-majors. No credit for EET majors.

EET 3113 Circuit Analysis II. Prerequisite(s): 2635 and MATH 2133. Application of elementary switching functions and LaPlace transforms to electronic circuit analysis in the S-plane, transfer functions, and the application of circuit analysis software.

EET 3124 Project Design and Fabrication. Lab 3. Prerequisite(s): 1244, 2544, 2635. Methods of designing, analyzing and fabricating electronic circuits using standard software packages. Heat transfer characteristics and problem solutions are included.

EET 3254 Microprocessors I. Lab 3. Prerequisite(s): 2544. An introduction to microcontrollers and their uses in embedded applications. Topics include system architecture, assembly language, structured programming, memory systems, user I/O, timers, peripherals, etc.

EET 3264 Microprocessors II. Lab 3. Prerequisite(s): 2544, 3254. A continuation of EET 3264. Programming and interfacing of microcontrollers in embedded application, including interrupts, EEPROM, serial programming, interfacing, power management, algorithms, stepper motor control.

EET 3354 Communication and Signal Processing. Lab 3. Prerequisite(s): 1244, 2635, MATH 2133, GENT 3123; Co-requisite(s): EET 3113. Bandpass signaling principles and techniques. The Fourier transforms; AM, SSB, PM, FM and PM signaling; binary modulated bandpass signaling (FSK and PSK); superheterodyne receiver; phase locked loop (PLL); modulators and mixers; frequency multiplication; special purpose IC’s.

EET 3363 Data Acquisition. Lab 3. Prerequisite(s): 2544 and 2635. Methods used to convert physical variables to digital signals and vice versa. Signal conditioning, digital-to-analog converters, analog-to-digital converters, sample-and-hold circuits, sensors, and transducers. The use of computers in data acquisition and signal processing.

EET 3524 Advanced Logic Circuits. Lab 3. Prerequisite(s): 2544. Computer based design, simulation and implementation of digital systems using a programmable logic device, field programmable gate arrays.

EET 3533 Introduction to Telecommunications. Lab 3. Prerequisite(s): 2544, 2635, 3254. Introductory course to the field of telecommunications. Study of the various technologies and how the application of these technologies work together to form functioning systems and networks.

EET 3713 Introduction to Electric Power Technology I. Prerequisite(s): 1244 or 3104, PHYS 1214, MATH 2123 and MATH 2133. Concurrent enrollment in MATH 2123 or equivalent course work is acceptable. Physical principles of electromagnetic and electromechanical energy conversion devices and their application to conventional transformers and rotating machines. Electrical energy generation, transmission and distribution.

EET 3723 Introduction to Electric Power Technology II. Lab 3. Prerequisite(s): 1244 or 3104, PHYS 1214, MATH 2123 and 2133. Concurrent enrollment in MATH 2123 or equivalent course. Physical principles of electromagnetic and electromechanical energy conversion devices and their application to conventional transformers and rotating machines. Electrical energy generation, transmission and distribution.

EET 4050 Advanced Electronic Problems. 1-4 credits, max 4. Prerequisite(s): Junior standing and consent of head of department. Special problems in the electronic area.

EET 4314 Elements of Control. Lab 3. Prerequisite(s): 3113 and 3363 and GENT 3123. Principles of analog and digital control, with emphasis on the analysis of feedback control systems in their various conceptual configurations. Application of feedback control theory to the analysis and design of present day circuits and systems. Use of circuit analysis software.


EET 4514 Advanced Telecommunication Topics. Lab 1. Prerequisite(s): 3533. Study of data transmission techniques between digital electronic devices.


EET 4833 Industrial Project Design I. Lab 6. Prerequisite(s): 20 credit hours of upper-diappend electronics courses or consent of instructor. Course mirrors the design process in industry. Topics covered are Design Team formation, Identify Objectives, define design specifications, write specifications, create a state of work and Gantt chart, create a project budget, perform a Preliminary Design Review, Design Prototype.


Engineering (ENGR)

ENGR 1111 Introduction to Engineering. An introduction to the study and practice of engineering. Skills for students in CEAT; expected engineering student behavior; tools needed by CEAT students; and the role of engineers in society. Introduction to engineering ethics; safety issues; and the relationship of engineering to social, global and contemporary issues. Student enrichment opportunities in the CEAT. May not be used for degree credit with ENGR 1113.

ENGR 1113 Introduction to Engineering Mathematics. Prerequisite(s): High school algebra or MATH 0123 or equivalent. This course focuses on applications of engineering mathematics to analysis and design problems across disciplines of engineering. Application of algebra, trigonometry, linear systems of equations, and basic calculus are illustrated through hands-on laboratory experiments and design projects. May not be used for degree credit with ENGR 1111.

ENGR 1322 Engineering Design with CAD. Lab 2. Introduction to engineering design using modern design methodologies and computer-aided tools. Design, construction and testing through participation in a multidisciplinary team-based design project contest.

ENGR 1332 Engineering Design with CAD for MAE. Lab 2. Introduction to engineering design using modern design methodologies and computer-aided tools appropriate for mechanical and aerospace engineering. Design, construction and testing through participation in a multidisciplinary team based design project contest.

ENGR 1342 Engineering Design with CAD for ECE. Lab 2. Introduction to engineering design using modern design methodologies and computer-aided tools appropriate for electrical and computer engineering. Design, construction and testing through participation in a multidisciplinary team-based design project contest.

ENGR 1352 Engineering Design with CAD for CHE. Lab 2. Introduction to engineering design using modern design methodologies and computer-aided tools appropriate for chemical engineering. Design, construction and testing through participation in a multidisciplinary team-based design project contest.

ENGR 2030 Co-op Industrial Practice I. 1-3 credits, max 6. Prerequisite(s): 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.

ENGR 2100 Orientation Projects. 1-3 credits, max 3, Lab 2-6. Prerequisite(s): Pre-engineering standing. Enrollment in independent study or small groups. Projects to assist students with special needs to adjust to engineering curriculum.

ENGR 3030 Co-op Industrial Practice II. 1-3 credits, max 6. Prerequisite(s): 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.

ENGR 3061 Domestic Scholars Experience. Prerequisite(s): Consent of the coordinator of CEAT Student Services. Participation in the domestic scholars experience.

ENGR 3080 International Experience. 1-18 credits, max 36. Prerequisite(s): Consent of the associate dean of the college. Participation in a formal or informal educational experience outside of the USA.

ENGR 3090 (I) Study Abroad. 1-18 credits, max 36. Prerequisite(s): Consent of the Study Abroad office and associate dean of the college. Participation in an OSU reciprocal exchange program.

ENGR 4010 Engineering Problems and Design. 0-6 credits, max 6. Prerequisite(s): Permission of the instructor. Special projects and independent study.

ENGR 4030 Co-op Industrial Practice III. 1-3 credits, max 6. Prerequisite(s): 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.

ENGR 4043* (I) International Engineering Service Learning I. Prerequisite(s): Approval of instructor. International engineering service learning experience. Project design, construction, implementation and training to provide permanent answer to client’s needs. Emphasis on the development of culturally acceptable engineering designs. Includes classroom lectures, hands-on design, writing assignments and travel to foreign country. For both engineering and non-engineering majors.

ENGR 4053* (I) International Engineering Service Learning II. Prerequisite(s): ENGR 4043 and approval of instructor. A continuation of ENGR 4043. International engineering service learning experience. Project design, construction, implementation and training to provide permanent answer to clients’ needs. Emphasis on the development of culturally acceptable
engineering designs. Includes classroom lectures, hands-on design, writing assignments and travel to foreign country. For both engineering and non-engineering majors.

ENGR 4060 Top Topics in Technology and Society. 1-3 credits, max 6. Problems of society relating to technology and added problems stemming from their solution. Minimal reliance on mathematics; for engineering and non-engineering students.

ENGR 4061 CEAT Scholars Study Abroad. Prerequisite(s): Permission of instructor. Comparison of technologies, history, culture and economic systems between the U.S. and another country or countries. Includes both classroom and travel for on-site study.

ENGR 4073 (I) Technology and Culture of Italy. Prerequisite(s): Approval of instructor. Examination of the technology, history and culture of Italy, with an emphasis on the development of cultural competency. Analysis of similarities and differences in professional practices. Includes classroom lectures, writing assignments and travel to Italy. Minimal reliance on mathematics. For both engineering and non-engineering majors.

ENGR 4083 (I) Technology and Culture of Brazil. Prerequisite(s): Approval of instructor. Examination of the technology, history and culture of Brazil, with an emphasis on the development of cultural competency. Analysis of similarities and differences in professional practices. Includes classroom lectures, writing assignments and travel to Brazil. Minimal reliance on mathematics. For both engineering and non-engineering majors.

ENGR 4093 (I) Technology and Culture of France. Prerequisite(s): Approval of instructor. Examination of the technology, history and culture of France, with an emphasis on the development of cultural competency. Analysis of similarities and differences in professional practices. Includes classroom lectures, writing assignments and travel to France. Minimal reliance on mathematics. For both engineering and non-engineering majors.

ENGR 4103 Impact of Law on Engineering Practice. Prerequisite(s): Junior standing or consent of instructor. Principles and impact of U.S. and international laws and regulations on technical professionals, including the impact of environmental regulations, intellectual property laws, tort claims, and product liability on the design, research and oversight of technologies.

ENGR 4113 Intellectual Property Law for Technical Professionals. Prerequisite(s): Junior standing or consent of instructor. Law and regulations of patents, copyrights and other intellectual property protection methods. Impact of statutory and common law on the practice of technical professionals and how they can exploit intellectual property in their daily work.

ENGR 4123 Tort and Products Liability Law for Technical Professionals. Prerequisite(s): Junior standing or consent of instructor. Legal liability of the work product and duties of technical professionals to the public. Relevant statutory, regulatory and common law relating to torts, specifically products liability.

ENGR 4133 Environmental Regulation for Technical Professionals. Prerequisite(s): Junior standing or consent of instructor. Environmental laws and regulations are omnipresent in the practice of engineering, science and architecture. Survey of environmental laws and regulations affecting the practice of these professions.

ENGR 4201 Principles of Nuclear Engineering. The nuclear enterprise, radiation, biological effects of ionizing radiation, nuclear reactor power plants, radioactive waste disposal, the fission process, food irradiation activities, applications of nuclear data in space, approaches to radiation detection, thermoneutron fusion, and nuclear weapons and proliferation.

ENGR 4203 Nuclear Technologies in Society: Fulfilling Madame Curie’s Dream. Introduction to applications of nuclear science and technology and the radiation principles governing these applications. Problem-based learning environment. Classroom activities are web-based and include reference materials and modules to be completed by students.

ENGR 4211 Introduction to Nuclear and Radiation Engineering Concepts. Aspects and applications of nuclear and radiation engineering/physics. History of nuclear development, basic concepts of radiation and radioactivity, radioactive waste management, warming and the impact of nuclear power plants, industrial applications, health physics, nuclear medicine, job opportunities at power plants, graduate school and national labs.

ENGR 4213 Elements of Nuclear Engineering. Prerequisite(s): 4201, 4211 or 4203 and MATH 2163, PHYS 2114. Nuclear engineering concepts and applications, including nuclear reactions, radioactivity, radiation interaction with matter, reactor physics, risk and dose assessment, applications in medicine, industry, agriculture and research.

ENGR 4223 Nuclear Reactor Engineering. Prerequisite(s): 4213 and MATH 2233. Physics governing nuclear reactors and the design principles for commercial nuclear power plants. Reactor designs currently operating in the power industry. Generation III and Generation IV reactor designs are also discussed.

ENGR 4233 Energy Systems and Resources. Prerequisite(s): 4213. Energy systems, renewable and non-renewable energy sources, and advances in energy applications.

ENGR 4243 Radiation Protection and Shielding. Prerequisite(s): 4213 and MATH 2233. Radiation protection, doses, associated risks, and exposure limits, properties of natural and other radiation sources, and evaluation of internal and external doses; and techniques for shield design including ray, point kermal, and transport theories for both neutrons and gamma rays.

ENGR 4253 Nuclear Reactor Analysis. Prerequisite(s): 4213 and MATH 2233. Fundamental physical principles, concepts and modeling techniques for analysis and design of nuclear reactors. Prepares students to analyze nuclear reactors into nuclear dynamics of performance, dynamics and safety and to either develop new designs or to assess existing or proposed designs based upon fundamental understanding of reactor physics.

ENGR 4263 Nuclear Reactor Theory. Prerequisite(s): 4243. Introduction to neutron diffusion theory, neutron moderation, neutron thermalization, and criticality conditions of nuclear reactors. Distance education only.

ENGR 4273 Probabilistic Risk Assessment. Prerequisite(s): 4213. This course is a detailed introduction to neutron diffusion theory, neutron moderation, neutron thermalization, and criticality conditions of nuclear reactors.

ENGR 4333 Production Engineering. Prerequisite(s): Consent of instructor. Fundamental production engineering design, evaluation, and optimization for oil and gas wells, including well deliverability, formation damage and skin analysis, completion performance, and technologies that improve oil and gas well performance.

ENGR 4343 Reservoir Engineering. Prerequisite(s): Consent of instructor. Reservoir description techniques using petrophysical and fluid properties; engineering methods to determine fluids in place, identify production-drive mechanisms, and forecast reservoir performance; implementation of pressure-maintenance schemes and secondary recovery.

ENGR 5101 Engineering Problems and Design. 1-6 credits, max 6. Prerequisite(s): Permission of instructor. Special projects and independent study.

ENGR 5103 Advanced Impact of Law on Engineering Practice. Prerequisite(s): Graduate standing. Principles and impact of U.S. and international laws and regulations on technical professionals, including the impact of environmental regulations, intellectual property laws, tort claims, and product liability on the design, research and oversight of technologies.

ENGR 5113 Advanced Intellectual Property Law for Technical Professionals. Prerequisite(s): Graduate standing. Law and regulations of patents and other IP protection methods. Impact of statutory and common law has made on the practice of technical professionals and how they can exploit IP in their daily work.

ENGR 5123 Advanced Tort and Products Liability Law for Technical Professionals. Prerequisite(s): Graduate standing. Legal liability of the work product and duties of technical professionals to the public. Relevant statutory, regulatory and common law relating to torts, specifically products liability.

ENGR 5133 Advanced Environmental Law for Technical Professionals. Prerequisite(s): Graduate standing. Environmental laws and regulations are omnipresent in the practice of engineering, science, and architecture. This course will survey the environmental laws and regulations affecting the practice of these professions.

ENGR 5313 Drilling Engineering. Prerequisite(s): Consent of instructor. Introduction to drilling systems, wellbore hydraulics, casing design, identification and solution drilling problems; well cementing; drilling of directional and horizontal wells; wellbore surveying; abnormal pore pressure; fracture gradients; well control; offshore drilling; underbalanced drilling. Offered through distance education only. No credit with credit in 4213.

ENGR 5333 Production Engineering. Prerequisite(s): Consent of instructor. Fundamental production engineering design, evaluation, and optimization for oil and gas wells, including well deliverability, formation damage and skin analysis, completion performance, and technologies that improve oil and gas well performance. Offered through distance education only. No credit with credit in 4333.

ENGR 5343 Reservoir Engineering. Prerequisite(s): Consent of instructor. Reservoir description techniques using petrophysical and fluid properties; engineering methods to determine fluids in place, identify production-drive mechanisms, and forecast reservoir performance; implementation of pressure-maintenance schemes and secondary recovery. Offered through distance education only. No credit with credit in 4343.

Engineering Science (ENSC)

ENSC 2113 Statics. Prerequisite(s): MATH 2144 and either PHYS 1114 or 2014. Resultants of force systems, static equilibrium of rigid bodies, statics of structures, and fluid statics. Shear and moment diagrams.

ENSC 2123 Elementary Dynamics. Prerequisite(s): 2113. Kinematics and kinetics of particles, systems of particles, and rigid bodies from a Newtonian viewpoint using vector algebra and calculus. Work-energy and impulse-momentum principles. Planar and three-dimensional kinetics and kinematics of rigid bodies.

Engineering and Technology Management (ETM)

ETM 5101* Seminar. 1-6 credits, max 6. Prerequisite(s): Admission to the master’s program or consent of instructor. Guided study in a topic area selected to enhance a student’s program.

ETM 5111* Introduction to Strategy, Technology and Integration. Prerequisite(s): Admission to the MSETM program or consent of instructor. Introduces students to the discipline of engineering and technology management, emphasizing the importance of strategy, technology, and integration, where timing of products and services are keys to market success.

ETM 5133* Capstone to Strategy, Technology and Integration. Prerequisite(s): Enrollment in last semester of MSETM program or consent of adviser. Independent analysis of a business problem. Student prepares a proposal and report that makes substantive use of MSETM material, and is a notable and relevant contribution to the student’s organization. Readings and discussions.

ETM 5143* Strategic Decision Analysis for Engineering and Technology Managers. Prerequisite(s): Admission to MSETM program or consent of instructor. Introduction to analytical concepts and procedures engineering and technology managers can use to strategically allocate resources to achieve business objectives. Strengths and weaknesses of alternative analytical procedures to evaluate alternative resource allocation decisions are outlined. Theoretical foundations, data requirements, application and strengths and weaknesses of cost-benefit analysis techniques when making strategic management decisions are evaluated.

ETM 5153* Foundations of Engineering Management. Prerequisite(s): Admission to MSETM program or consent of instructor. Principles and practices of the management of engineering and technology activities. Focus is on the tools and methods for solving problems in service and industrial systems.

ETM 5163* Business Innovation and Technology. Advanced study of innovation and technology in a business setting. Strategic development of internal and external innovation. Planning, implementation, evaluation and control technology. No degree credit for those with credit in MGMT 5553 Management of Technology and Innovation.

ETM 5211* Enterprise Integration. Prerequisite(s): Admission to the MS in ETM program or consent of instructor. Conceptualizing, designing and operating advanced manufacturing systems within an integrated enterprise-wide framework. Recent developments in computer and communication technologies and conceptual breakthroughs regarding the nature and behavior of integrated enterprises.

ETM 5221* Engineering Teaming. Prerequisite(s): Admission to the MS in ETM program or consent of instructor. Management and group issues inherent in the application and implementation of high performing work teams. The team’s roles in improving organizational performance, along with the best practice procedures and techniques that promote team effectiveness.

ETM 5231* Benchmarking. Prerequisite(s): Admission to the MS in ETM program or consent of instructor. Benchmarking as an effective approach to study and adapt or adopt methodologies representing best specific practices from any industry; or identify and assess performance based on equivalent and common measures usually from those in the same or similar industries, including competitors.

ETM 5241* Strategic Project Management. Prerequisite(s): Admission to the MS in ETM program or consent of instructor. Overview of traditional project management concepts and techniques (i.e., Gantt charts, PERT, CPT) along with several technical issues related to their effective use. Fundamental nature of the problems associated with several technical issues related to their effective use. Fundamental nature of the problems associated with several technical issues related to their effective use.
quality management systems (both high quality and typical methods).

ETM 5511* Capstone Preparation. Prerequisite(s): Admission to the MSETM program and at least 17 hours earned toward MSETM degree or departmental permission. Introduction to the requirements for the ETM Capstone Project, including problem statements, strategic implications, management systems, and problem metrics. Emphasis is placed on persuasive technical communication.

ETM 5521* Quick Response Manufacturing. Prerequisite(s): Admission to the MSETM program or departmental permission. Introduction to QRM, an enterprise-wide strategy for lead-time reduction. Discussion of the four core concepts of QRM - realizing the power of time, rethinking organizational structures, understanding and expediting system dynamics, and implementing a unified strategy enterprise-wide. Definitions of manufacturing critical-path time (MCT) map. Focused target market segment (FTMS), and material control strategy POLCA. Case studies and MPX software.

ETM 5943* Lean Sigma Implementation. Prerequisite(s): IEM 5113, admission to the MSETM program or departmental permission. Introduction to the implementation skills necessary to successfully apply lean manufacturing and six sigma concepts and manage continuous improvement within a small to mid-sized firm. Successfully combining leadership, organizational dynamics and skills in meeting customer expectations. Planning, applying and monitoring these learned skills.

Engineering Technology
(See specific technology programs listed alphabetically)

English (ENGL)

ENGL 0003 Academic English for Graduate Students. Study and practice of English listening, reading and speaking skills required for graduate study. Graded on satisfactory-unsatisfactory basis.

ENGL 1010 Studies in English Composition. 1-2 credits, max 2. Special study in composition for transfer students to fulfill general education requirements as established by Regent's policy.

ENGL 1113 Composition I. The fundamentals of expository writing with emphasis on structure, development and style.

ENGL 1123 International Freshman Composition I. Restricted to students whose native language is not English. Expository writing with emphasis on structure and development. Special attention to problems of English as a second language. This course may be substituted for 1113.

ENGL 1213 Composition II. Prerequisite(s): 1113 or 1123 or 1313. Expository composition with emphasis on technique and style through intensive and extensive readings.

ENGL 1223 International Freshman Composition II. Prerequisite(s): 1113 or 1123. Restricted to students whose native language is not English. Expository composition with emphasis on technique and style in writing research papers. May be substituted for 1213.

ENGL 1313 Critical Analysis and Writing I. Expository writing forms, including summary, critique and synthesis. Writing assignments based on readings from across the curriculum. May be substituted for 1113 for gifted writers who seek a more challenging course.

ENGL 1413 Critical Analysis and Writing II. Critical thinking, research, and writing skills necessary for success in courses across the curriculum. Some sections available for honors credit. May be substituted for 1213 for gifted writers who seek a more challenging course.

ENGL 1923 (H) Great Works of Literature. Readings in the great works of the most important writers of Britain and America, such as Shakespeare, Dickens, Twain, Faulkner, and others.

ENGL 2233 (H) Writing as a Profession. An overview of genres and styles of writing in professional contexts, including organizations, science and industry.


ENGL 2413 (D,H) Introduction to Literature. Fiction, drama/film and poetry that introduces students to the elements of all genres and focuses on the diversity of underrepresented and socially constructed segments of American society. Written critical exercises and discussion.

ENGL 2443 (I) 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)

ENGL 2453 (H) Introduction to Film and Television. Introduction to the formal analysis of moving images - film, television, and new media - in aesthetic, cultural, and political contexts. Students discuss and write about films and other moving images screened in class.

ENGL 2513 (H) Introduction to Creative Writing. Literary composition with emphasis on techniques and style through readings and writings in fiction, poetry and creative nonfiction.

ENGL 2543 Survey of British Literature I. The beginnings through the Neo-Classical Period.

ENGL 2653 Survey of British Literature II. The Romantic Period to the present.

ENGL 2773 (D) Survey of American Literature I. The Puritans through the Romantic Period.

ENGL 2883 (D) Survey of American Literature II. The Romantic Period to the present.

ENGL 2963 (H,I) Survey of Nonwestern Traditions. Survey of Nonwestern, including Native American, literatures.

ENGL 3030 Fiction Writing. 3 credits, max 6. Prerequisite(s): 2513. Directed readings and practice in writing fiction with special attention to techniques.

ENGL 3040 Poetry Writing. 3 credits, max 6. Prerequisite(s): 2513. Directed readings and practice in writing poetry with special attention to techniques.

ENGL 3050 Screenwriting. 3 credits, max 6. Prerequisite(s): 2453. The reading and discussion of screenplays in the Hollywood style, including exercises on three-act structure, conflict-building, and characterization. Students write and revise a 30-page fictional screenplay as their term project and supply weekly critiques of their peers’ work.

ENGL 3060 Creative Nonfiction Writing. Prerequisite(s): 2513. Directed readings and practice in writing nonfiction with special attention to techniques.

ENGL 3123 (H) Mythology. Myths, their cultural context, and their place in world literature.

ENGL 3153 (D,H) Readings in Literature by Women. The collection of literature written by women in England and America, classical and modern figures.

ENGL 3163 (H) World Literature I. Selected literary masterpieces exemplifying ideals and values in Western cultures.

ENGL 3170 Readings in Literature and Other Disciplines. 3 credits, max 6. A study of literature and its historical or thematic connections to one or more of the fine arts or disciplines in the humanities or social sciences.

ENGL 3183 (D,H) Native American Literature. Origins and development of a literary tradition in its historical and cultural context.

ENGL 3190 Readings in Postcolonial and Multiethnic Literature. 3 credits, max 6. Principal literary and critical texts written in English either by writers from parts of the world once colonized by the West or by American writers of different ethnic origins whose work bridges cultures.


ENGL 3200 Special Problems in Language and Literature. 1-3 credits, max 3. Prerequisite(s): 9 credit hours of English. Specialized readings and independent study.

ENGL 3203 Advanced Composition. Prerequisite(s): 9 hours of English. An advanced writing course based on contemporary theories of composition.

ENGL 3223 Professional Writing Theory. Major theories, issues, and methodologies in professional writing.

ENGL 3243 Literary Theory and Criticism. Study of the major works of critical theory and literary criticism.

ENGL 3263 Screen Theory. Lab 2. An inquiry into the major concepts and debates of mass-media theory. Issues addressed include the nature of the relationship between images and reality; the psychological and cultural significance of style in film, television, and new media representations; and the role that mass-media play in the organization of social and political relations.

ENGL 3323 Technical Writing. Prerequisite(s): 1113 or 1213 or 1313 and junior standing. Applied writing in areas of specialization. Intensive practice in professional/technical writing genres, styles, research techniques and editing for specialized audiences. This course may be substituted for 1213 with an “A” or “B” in 1113 and consent of the student’s college.

ENGL 3333 (H) Short Story. Origins, development, theory and craft of the short story.

ENGL 3343 Reading Poetry. This course in poetic literacy will introduce students to the major poetic forms, to changes in aesthetics of poetry over time, to figurative language, to proseody, to the particular interpretive skills required to understand and write about the genre.

ENGL 3363 (H) Readings in Drama. Close study of representative plays of various periods (for example, Classical, Renaissance, Restoration, Modern, and others) and of the main formal categories (tragedy, comedy).

ENGL 3373 Readings in Nonfiction. Theory and practice of creative nonfiction in English, including autobiography, travel writing, literary journalism, cultural dependence and the essay.

ENGL 3383 Readings in Narrative. Readings in narrative of different periods and different genres.

ENGL 3410 Popular Fiction. 3 credits, max 6. Study of certain popular genres of fiction including science fiction, detective fiction, Western fiction, horror and the grotesque, the romance, American humor. Course content varies by semester. Exploration of the characteristics and evolution of the genre while developing skills in reading, writing and thinking critically.
ENGL 3433 (H) Introduction to Television Studies. Lab 2. A focused examination of one aspect of television culture, technology, history and/or style. While the particular topics to be considered vary, and include everything from TV genres to TV theories, in each instance the course gives students an in-depth understanding of how television shapes the social and political world in which we live.

ENGL 3443 (H) Studies in Film Genre. A comparative study of types of films both inside the Hollywood system and in other national cinemas. The western, the film noir and the musical, as well as genres from such countries as France, Germany and Japan. Focused knowledge of selected genres, a sense of the economic imperatives that necessitate generic "contracts" between film producers and viewers and knowledge of the history of specific genres.

ENGL 3453 (H) History of American Film. Lab 2. Examines the history of cinema in the U.S. from its beginnings until the present, addressing such issues as: the origins of cinema, the coming of sound, American film genres, the Hollywood studio system, censorship, the challenge of television, the new American cinema of the 1970s, the politics of independent film production, and the rise of computer-generated imagery.

ENGL 3463 (H,J) History of International Film. Lab 2. Introduction to the history of international cinema and the principal eras in film history, focusing on the moments when different national cinemas flourished.

ENGL 3473 (D) Race, Gender, and Ethnicity in American Film. Lab 2. A survey of race, gender, and ethnicity as they have been represented in American films. (Same course as AMST 3473)

ENGL 3503 (D,H) Television and American Society. Examination of television within the social and cultural context of the U.S. Looks at the aesthetic and industrial practices that shape representation on TV and the effects of those practices, particularly for socially disempowered groups. (Same course as AMST 3503)

ENGL 3813 (D,H) Readings in the American Experience. Life in the New World from the colonial to the postmodern era using a multiplicity of interdisciplinary texts that demonstrate the emergence and ongoing evolution of distinctive American identities. (Same course as AMST 3813)

ENGL 3903 Writing Center Theory and Practice. Lab 4. Prerequisite(s): six hours English or consent of instructor. Writing center research with practical applications in writing instruction.

ENGL 3933 (H) Shakespeare. Recurring themes and their variations in Shakespeare's work. Nature of these genres in the period and Shakespeare's innovations. The structure and language of the plays, occasional examination of historical documents and contexts, modern performances, and critical essays.

ENGL 4003 History of the English Language. The growth of the English language.

ENGL 4013 English Grammar. The traditional terminology and concepts of English grammar leading or evolving into the several current systems of description.

ENGL 4033 Discourse Analysis. Introduction to the analysis of the language used in spoken and written discourse contexts in a variety of genres.

ENGL 4043 Teaching English to Speakers of Other Languages. Designed to develop the skills and techniques needed in teaching English to speakers of other languages (TESOL). Examines the theoretical issues behind the practice and methodologies and classroom techniques, including the testing of English and the selection and preparation of teaching materials.

ENGL 4063 Introduction to Descriptive Linguistics. The methodology of linguistic analysis.

ENGL 4073 Introduction to Sociolinguistics. The study of how languages and varieties vary in social contexts and how they are regarded.

ENGL 4080 Studies in Linguistics. 3 credits. max 6. Study of a topic in linguistics, chosen at the instructor's discretion.

ENGL 4083 Applied Linguistics. Introduction to the applied study of language in use, including aspects of discourse, power, identity, and language choice among other topics.

ENGL 4093 Language in America. Historical development of American English. Regional, social and cultural language differences.

ENGL 4100 Studies in Medieval British Literature. 3 credits, max 6. Special topics encompassing the many different ethnic traditions and genres found in medieval British literature.

ENGL 4110 Studies in 16th Century British Literature. 3 credits, max 6. Literature themes of the English Renaissance focusing on related authors and topics. Authors include Shakespeare, Spenser, Sidney, Marlowe, Raleigh, Wyatt, and Spenser. Focused knowledge of selected topics in English literature from 1560-1600. Various writers and their works and themes and literary developments of the period. Topics vary by semester.

ENGL 4143 Language and Technology. Introduction to the use of linguistic knowledge in computer applications today. How the study of language has contributed to the advancement of technology and how certain computational problems have influenced the way linguistics studies language.


ENGL 4170 Studies in 20th Century British Literature. 3 credits, max 6. Various topics focusing on the literature and culture of Britain and Ireland, such as 20th century British and Irish fiction, poetry, or drama; The City; The Irish Renaissance.

ENGL 4200 Studies in Early American Literature. 3 credits, max 6. Readings and topics in early American literature and culture.

ENGL 4210 Studies in 19th Century American Literature. 3 credits, max 6. Themes in 19th century American literature with attention to social and cultural contexts.

ENGL 4220 Studies in 20th Century American Literature. 3 credits, max 6. Topics focusing on the literature and culture of the United States, such as 20th century American fiction, poetry, or drama; alienation and activism; the impact of science and technology.

ENGL 4223* Introduction to Old English. The basics of pronunciation, vocabulary, and grammar, enabling students to read short works in prose and poetry.

ENGL 4230 Studies in Literature and Theory of Diversity. Readings on topics such as race, gender, sexuality, disability, and class.

ENGL 4253 (H) Moving Image Aesthetics. Lab 2. A historical and theoretical examination of the stylistic and affective dimension of moving images, including questions of beauty and ugliness, cuteness and the graphic, enjoyment and disgust, high and low culture. Screenings will vary from semester to semester, but may include examples of realism, lo-fi production, prestige pictures, documentary, music videos and cult cinema, and will include material from both American and international contexts.

ENGL 4300 Studies in Romanticism. 3 credits, max 6. Principle works of Romanticism, reflecting the cultural, social, and political developments.

ENGL 4310 Studies in Modernism. 3 credits, max 6. Selected topics in literature of the early twentieth century. Texts and themes will vary by semester.

ENGL 4320 Contemporary Literature. 3 credits. Studies and topics in contemporary literature.

ENGL 4330 Studies in Native American Literature. 3 credits, max 6. Readings and topics in Native American Literature and culture.

ENGL 4340 Studies in Postcolonial and Multi-ethnic Literature. 3 credits, max 6. Readings and topics in postcolonial literature and culture or multiethnic literature and culture.

ENGL 4350* Contemporary International Cinema. 3 credits. Lab 2. Examines major trends in contemporary international cinema of the last fifteen years. National cinema may include France, Germany, Italy, Spain, Sweden, China, Taiwan, India, South Korea, and Russia, amongst others.

ENGL 4400 Studies in Regional Literature. 3 credits, max 6. Literature of a nation such as Ireland or Canada, or of a region such as the American Southwest. Topic varies by semester.

ENGL 4450 Culture and the Moving Image. 3 credits, max 9, Lab 2. Prerequisite(s): 2453. An advanced class that examines in-depth the relation between moving images and a particular cultural phenomenon, including mass media and the production of violence, the moving image as common culture, television and the construction of domestic life, to name only a few possibilities.

ENGL 4520 Problems in English. 1-3 credits, max 6. Prerequisite(s): 12 credit hours of English. Specialized readings and independent studies.

ENGL 4523* Professional Writing Internship. Prerequisite(s): 4543 and 4553 or permission of instructor. Supervised work-and-learning experience in writing, editing, document design, and research in the workplace.

ENGL 4530* Studies in Professional Writing. 3 credits, max 9. Prerequisite(s): Six credit hours of English, including 3323; Selected topics in professional writing, focusing on a particular theme, issue or theoretical approach.

ENGL 4543* Style and Editing. Prerequisite(s): 4013. An intensive study of writing style and editing from the sentence level (including diction and word order) to the levels of genres of communication. Writing assignments on style for different audiences.

ENGL 4553* Visual Rhetoric and Design. Prerequisite(s): 3223. Major theories, issues, and methodologies in visual rhetoric and design. Practice of theory through guided composing work.

ENGL 4563* Scientific and Technical Literature. 3 credits, max 6. Readings and topics in professional writing, focusing on a particular theme, issue or theoretical approach.

ENGL 4573 Games and Writing. Major theories, practices, and methods of digital and procedural rhetorics. Students will study, analyze, and design
games, with special emphasis on how they make persuasive appeals through software and code.

ENGL 4600 Studies in Chaucer or Milton. 3 credits, max 6. Various topics focusing on the works of Chaucer or Milton.

ENGL 4620* Advanced Creative Nonfiction Writing. 3 credits, max 6. Prerequisite(s): 3030 or 3040. Intensive practice in creative nonfiction writing.

ENGL 4630* Advanced Fiction Writing. 3 credits, max 6. Prerequisite(s): 3030. Intensive practice in fiction writing.

ENGL 4640* Advanced Poetry Writing. 3 credits, max 6. Prerequisite(s): 3040. Intensive practice in poetry writing.

ENGL 4650* Advanced Screenwriting. 3 credits, max 6. Prerequisite(s): 3050. Discussion of professional screenplays and critiquing peers' work; completion of exercises on structure, visualization, and characterization; and writing a fictional screenplay.

ENGL 4700 Single Author or Work Pre-1800. 3 credits, max 6. Study of a single author or work prior to 1800 along with supporting literature. Chosen at the instructor's discretion.

ENGL 4710 Single Author or Work Post-1800. 3 credits, max 6. Study of a single author or work after 1800 along with supporting literature. Chosen at the instructor's discretion.

ENGL 4723 (H) Studies in Shakespeare. Focus on advanced topics in major plays and selected criticism.

ENGL 4893* Research Writing for International Graduate Students. Prerequisite(s): Graduate standing or permission of the instructor. Analysis and practice in the grammar and rhetorical structures specific to writing research papers in the disciplines.

ENGL 4993 Senior Honors Thesis. Prerequisite(s): Admission to Arts and Sciences 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.


ENGL 5013* Introduction to Graduate Studies. Principles and procedures in scholarly research.

ENGL 5063* Seminar in Shakespeare. Intensive study of a limited number of plays. Assignment of problems to individual students.

ENGL 5093* Seminar in Milton. Poetry, major prose and criticism.

ENGL 5120* Studies in Teaching English as a Second Language. 1-3 credits, max 6. Selected topics in teaching English as a second language; e.g. cross-cultural communication, materials preparation, bilingual education.

ENGL 5123* Approaches to Language Acquisition. An overview of theories of first and second language acquisition.

ENGL 5130* Studies in English Grammar. 3 credits, max 6. Selected study of current topics in grammatical theory as it applies to the teaching of English.

ENGL 5133* Phonetics and Phonology. Exploration of fundamental aspects of the use of sound in spoken language.

ENGL 5140* Seminar in Linguistics. 3 credits, max 6. Selective study of current topics in linguistics.

ENGL 5143* Descriptive Linguistics. An introduction to phonology, morphology, syntax and semantics.

ENGL 5153* Syntax. The study of the principles and rules for constructing phrases and sentences in natural languages.

ENGL 5163* Middle English Literature. Major works in Middle English.

ENGL 5173* Sociolinguistics. Introduction to linguistic change and variation in speech communities, focusing on the methods of data collection and analysis.

ENGL 5183* Acoustic Phonetics. Prerequisite(s): 5143 or 5153 or PDP. An introduction to acoustic phonetics. Students will learn basic principles of the acoustics of speech sounds, develop practical skills in instrumental measurement, and learn how acoustic data can answer questions about sounds and sound patterns in language.

ENGL 5201* Writing Center Theory and Pedagogy. The study of writing center theory and practice with the goal of application to one-to-one pedagogy.

ENGL 5210* Seminar or Directed Study. 1-6 credits, max 9. Specialized readings or independent studies.

ENGL 5213* Composition Theory and Pedagogy. The study of methods and materials for effective one-to-one and one-to-many teaching.

ENGL 5223* Professional Writing Theory and Pedagogy. The study of the needs of students in technical and professional writing service courses, major approaches to teaching professional writing, and the genres often taught in professional writing service courses.

ENGL 5243* Teaching English as a Second Language. Materials and methods of second language instruction.

ENGL 5313* Internship, Teaching English as a Second Language. Supervised teaching of beginning through advanced English as a second language courses.

ENGL 5333* Seminar in TESL: Testing. Standardized testing for teaching English as a second language.

ENGL 5340* Studies in Discourse Analysis. 3 credits, max 9. Selected topics in the study of language in use in spoken or written contexts.

ENGL 5353* Studies in the History of Rhetoric. An exploration of selected topics and texts in the history of Western and non-Western rhetoric from the classical period to the present.

ENGL 5360* Studies in Screen Studies. 3 credits, max 9. The exploration of key aesthetic issues of analysis and evaluation as they pertain to film criticism.

ENGL 5363* Critical Approaches to Screen Studies: Theory and History. Designed to provide students with an overview of fundamental theoretical and historical scholarship in film and television studies.

ENGL 5370* Studies in Television and New Media. 3 credits, max 9. Exploration of aesthetic, cultural, and ideological aspects of television and new media in the United States and abroad.

ENGL 5410* Seminar in British Literature of the 16th Century. 3 credits, max 9. Selected writers and their works, themes and literary developments of the 16th century.

ENGL 5420* Seminar in British Literature of the 17th Century. 3 credits, max 9. Selected writers and their works, themes and literary developments of the 17th century.

ENGL 5440* Seminar in British Literature of the 18th Century. 3 credits, max 9. Selected writers and their works, themes and literary developments of the 18th century.

ENGL 5460* Seminar in British Literature of the 19th Century. 3 credits, max 9. Selected writers and their works, themes and literary developments of the 19th century.

ENGL 5480* Seminar in Modern Literature. 3 credits, max 9. Selected writers and their works, themes and literary developments of modern literature.

ENGL 5520* Internship in Professional Writing. 3 credits, max 6. Prerequisite(s): permission of department. Supervised work-and-learning experience in writing, editing, document design, and research in the workplace.

ENGL 5523* Genres in Professional Writing. The study of the current status of genres in professional writing theories and its crucial role in professional writing practices.

ENGL 5553* Studies in Visual Rhetoric and Design. Advanced study of design and visual rhetorical theory. Practice of theory through guided composing work.

ENGL 5560* Seminar in Professional Writing. 3-9 credits, max 9. Advanced study of selected theories, themes, methods, debates, and developments in professional writing.

ENGL 5583* Environmental Writing. Consideration of the historical, political, cultural, and ethical contexts of modern environmentalism and examination of the rhetorical strategies in several types of environmental discourse. Major writing project tailored to individual research interests and career goals.

ENGL 5593* Seminar in Style and Editing. An advanced study of writing style and editing from the sentence level (including diction and grammatical arrangement) to the levels of genres of communication. Writing assignments on style for different audiences.

ENGL 5630* Seminar in Early American Literature. 3 credits, max 9. Selected writers and their works, themes and literary developments of the 17th and 18th centuries.

ENGL 5660* Seminar in American Literature of the 19th Century. 3 credits, max 9. Selected writers and their works, themes and literary developments of the 19th century.

ENGL 5680* Seminar in Contemporary Literature. 3 credits, max 9. Selected writers and their works, themes and literary developments in contemporary literature.

ENGL 5720* Seminar in Creative Nonfiction. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Writing creative nonfiction at the professional level.

ENGL 5723* Craft and Forms of Poetry. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Theory and practice of the poetic forms.

ENGL 5730* Seminar in Fiction Writing. 3 credits, max 9. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Writing fiction at the professional level.

ENGL 5740* Seminar in Poetry Writing. 3 credits, max 9. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Writing poetry at the professional level.

ENGL 5750* Seminar in Scriptwriting. 3 credits, max 6. Scriptwriting at the professional level.

ENGL 5763* Craft and Forms of Prose. Prerequisite(s): Admission to MFA or
PhD in Creative Writing or consent of instructor. Theory and practice of prose forms.

ENGL 5990* Special Problems. 1-3 credits, max. 6. Investigation into a designated area of English leading to material for creative component option (MA). Graded on a pass-fail basis.


ENGL 6130* Studies in Fiction Writing. 3 credits, max. 9. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Individual projects in fiction.

ENGL 6140* Studies in Poetry Writing. 3 credits, max. 9. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Individual projects in poetry.

ENGL 6160* Studies in Creative Nonfiction. 3 credits, max. 9. Prerequisite(s): Admission to MFA or PhD in Creative Writing or consent of instructor. Individual projects in creative nonfiction.

ENGL 6210* Seminar or Directed Study. 1-6 credits, max. 9. Specialized readings or independent studies.

ENGL 6220* Seminar in Genre. 3 credits, max. 9. The development, traditions, concerns or characteristics of genre in selected texts. Major genres and subgenres considered.

ENGL 6240* Studies in Literature. 3 credits, max. 9. Advanced topics in literature and literary research.

ENGL 6250* Seminar in Race and Ethnicity. 3 credits, max. 9. Study of the complex representation of race and ethnicity in literature.

ENGL 6260* Studies in Literary Criticism. 3 credits, max. 9. Selected work in literary criticism, for example ancient and neo-classical, 19th century, 20th century.

ENGL 6270* Seminar in Region. 3 credits, max. 9. Study of regional literature or language variation.

ENGL 6280* Seminar in Gender. 3 credits, max. 9. Examination of gender as an analytical category in the study of literature, discourse and society.

ENGL 6350* Topics in Rhetorical Theory. 3 credits, max. 9. Study of advanced topics in rhetorical theory and research, focusing on an important scholar in the field, a specific theme, or some combination of the two.

ENGL 6360* Seminar in Film and Society. 3 credits, max. 9. Social conduct and value systems as they affect the role of media in culture.

ENGL 6410* Topics in Linguistics. 3 credits, max. 9. Prerequisite(s): 5143. Study of advanced topics in linguistic theory and research.

ENGL 6420* Topics in Second Language Acquisition. 3 credits, max. 9. Prerequisite(s): 5243. Study of topics in second language theory and research.

ENGL 6500* Topics in Professional Writing. 3 credits, max. 9. In-depth study of selected topics in professional writing.

Entomology (ENTO)


ENTO 2143 Global Issues in Agricultural Biosecurity and Forensics. Biosecurity, biosafety, bioterrorism, microbial forensics, emerging organisms, invasive species, quarantine, response, surveillance, detection, diagnostics, and how all system components integrate to science, and to agricultural specialties, economics and defense. (Same course as PLP 2143)

ENTO 2223 (N) Insects in Global Public Health. Biology of diseases carried by arthropods, including their historical and societal impacts focusing on the intersection of arthropod and human biology.

ENTO 2993 (L,N) Introduction to Entomology. Basic biology and classification of insects and closely related arthropods. Overview of the ecological roles of insects in both natural and managed ecosystems.

ENTO 3003 Livestock Entomology. Economic importance, biology and control of pests affecting domestic animals. Biology of diseases carried by arthropods, including their impacts focusing on the intersection of arthropod and animal biology.

ENTO 3021 Postharvest, Structural and Urban Arthropod Pests. Lab 2. Prerequisite(s): 2993. The biology and management of insect pests of bulk-stored grains, flour, feed, dried fruits and nuts within food processing plants, warehouses, wholesale and retail distribution systems. Common structural and urban arthropod pests found in and around man-made buildings and their identification, biology and standard management practices.

ENTO 3044 Insect Physiology. Lab 2. Prerequisite(s): 2993 and one course in organic chemistry and nine credit hours of biology. Functions of organ systems and demonstration of selected techniques for study of insect physiology. Offered in combination with 5044. No credit for both 3044 and 5044.

ENTO 3331 Insect Pests of Agronomic Crops. Lab 2. Prerequisite(s): 2993 or concurrent enrollment. A survey of important arthropods of agronomic crops commonly grown in Oklahoma. Coverage includes identification of pests and beneficial insects, recognition of damage symptoms, discussion of sampling strategies and decision-making processes for management, and integrated pest management tactics.

ENTO 3421 Horticultural Insects. Lab 2. Prerequisite(s): 2993 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.

ENTO 3481 Insects in Forest Ecosystems. Lab 2. Prerequisite(s): 2993 or concurrent enrollment. Identification and seasonal life history of insect pests and beneficial insects on shade trees in urban settings, in commercial forests, and in forest products.

ENTO 3501 Entomology for Educators. Lab 2. Hands-on laboratory course designed to provide high school science teachers, FFA or 4H leaders with all of the resources and background information needed to use insects as a model to teach scientific concepts. Curriculum and resources are provided at the level of 7-12th grade and may be adapted to other levels as needed.

ENTO 3644 Insect Morphology. Lab 4. Prerequisite(s): 2993 or equivalent. Insect development and comparative morphology. Offered in combination with 5644. No credit for both 3644 and 5644.

ENTO 3663 Turfgrass Integrated Pest Management. Lab 2. Prerequisite(s): 3343 or ENTO 2993. The biology, ecology, and identification of fungal, nematode, and insect turfgrass pests. Contemporary concepts and applications of integrated control practices available for managing turfgrass pests along with decision-making tools for use in turfgrass pest management programs. (Same course as PLP 3663)

ENTO 4223* Ecological Methodology. Lab 2. Prerequisite(s): One course in either ecology or general biology. Use of insects and other invertebrates for describing and evaluating interactions of individuals and populations with their environments. Coverage of behavioral and physiological ecology on consequences to individuals; population and community ecology considered in dynamics of groups of organisms in ecosystems.

ENTO 4400 Special Topics. 1-3 credits, max. 3. Prerequisite(s): Consent of instructor. Special topics in plant pathology, entomology or related fields. (Same course as PLP 4400)

ENTO 4464 Insect Biology and Classification. Lab 4. Prerequisite(s): 2993 or equivalent or consent of instructor. Insect phylogeny, taxonomy, behavior, morphology and physiology in the context of ecosystem function. Major roles of insects in shaping ecosystem diversity, as indicators of environmental integrity, and as vectors of plant and animal pathogens and parasites.

ENTO 4484 Aquatic Entomology. Lab 4. Prerequisite(s): 2993 or ZOOL 1604 or consent of instructor. Biology, taxonomy and ecology of insects and other invertebrates, inhabiting freshwater environments. Emphasis is placed on identification and biology of individual taxa. Roles of insects in aquatic ecology as a forage base, and as indicators of biotic integrity of aquatic systems. Linkages between aquatic systems and terrestrial systems are also examined. No credit for students with credit in ENTO 5484 or ZOOL 5484. (Same course as ZOOL 4484)

ENTO 4733 Insect Behavior and Chemical Ecology. Prerequisite(s): 2993 and CHEM 3015 or equivalent. Behavioral biology of insects. Ecological interactions among organisms mediated by naturally produced chemicals. An interface of ecology, behavior, physiology and chemistry with examples from animals, plants and microorganisms. Origin, function, significance and utilization of semiochemicals such as pheromones and allelochemicals. No credit for students with credit in ENTO 5733.

ENTO 4800 Entomology Practicum. 1-6 credits, max. 6. Prerequisite(s): Consent of practicum coordinator and adviser. Supervised research or extension experience with faculty in the Entomology/Plant Pathology Dept. or with approved governmental agencies or private employers. Written report required at close of practicum.

ENTO 4854 Medical and Veterinary Entomology. Lab 4. Prerequisite(s): 2993 or consent of instructor. Biology and control of arthropod vectors of disease and the diseases carried by arthropods. Course includes emphasis on scientific writing skills. No credit for students with credit in 5854.

ENTO 4923* Applications of Biotechnology in Pest Management. Prerequisite(s): BIOL 1114 and CHEM 1215 or equivalents. Applications of biotechnology in managing arthropod pests of plants, animals, plant pathogens, and weeds. Introduction to underlying technology, products being developed and deployed, effectiveness and associated problems or concerns resulting from their use. (Same course as PLP 4923 and PLNT 4923)

ENTO 5000* Master’s Research and Thesis. 1-6 credits, max. 6. Research in entomology.

ENTO 5003* Insect Biochemistry. Prerequisite(s): 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.

ENTO 5020* Special Problems. 1-8 credits, max. 8. Prerequisite(s): Graduate standing. Selected studies in the area of entomology, acarology or araneology.
ENTO 5044* Insect Physiology. Lab 2. Prerequisite(s): 2993 or equivalent and one course in organic chemistry and nine credit hours in biology. Functions of the organ systems and demonstration of selected techniques for study of insect physiology. Offered in combination with 3044. No credit for both 3044 and 5044.

ENTO 5464* Insect Biology and Classification. Prerequisite(s): 2993 or equivalent or consent of instructor. Insect phylogeny, taxonomy, behavior, morphology and physiology in the context of ecosystem function. Major roles of insects in shaping ecosystem diversity, as indicators of environmental integrity, and as vectors of plant and animal pathogens and parasites. No credit for students with credit in ENTO 4464.

ENTO 5484* Aquatic Entomology. Lab 4. Prerequisite(s): 2993 or ZOOL 1604 or consent of instructor. Biology, taxonomy and ecology of insects and other invertebrates, inhabiting freshwater environments. Emphasis is placed on identification and biology of individual taxa. Roles of insects in aquatic ecology are a focus, as indicators of integrity of aquatic systems. Graduate students will have extra collection requirements and biotic integrity analyses. No credit for students with credit in ZOOL 5484, ENTO 4484 or ZOOL 4484. (Same course as ZOL 5484)

ENTO 5501* Entomology for Educators. Lab 2. Hands-on laboratory course designed to provide educators (teachers, FEMA or 4H leaders, etc.) with all of the resources and background information needed to use insects as a model to teach scientific concepts. No credit given for students who have taken ENTO 3501.

ENTO 5513* Biological Control. Lab 2. Prerequisite(s): 2993 or equivalent or consent of instructor. The ecological principles and applied practices of biological control of insects, weeds and plant pathogens. Epizoology including the scientific basis of biological control; natural enemies and their biology; biological control methods; and biological control in integrated pest management programs.

ENTO 5524* Integrated Management of Insect Pests and Pathogens. Lab 4. Prerequisite(s): 2993 and PLP 3344 or equivalent or consent of instructor. Modern theory and practices for management of insect pests and pathogens in plant production systems, emphasizing an ecologically-based, integrated approach. Basic concepts of pest management, decision-making, cost/benefit analysis and risk/benefit analysis. (Same course as PLP 5524)

ENTO 5550* Advanced Agronomic Entomology. 1-5 credits, max 5. Prerequisite(s): 4523. Special problems in advanced agronomic entomology.

ENTO 5613* Host Plant Resistance. Lab 2. Prerequisite(s): 2993 and PLP 3343 or equivalent and a general genetics course; or consent of instructor. Interactions of plants and the herbivorous insects and pathogenic microorganisms that attack them. Development and deployment of multiple-pest resistant cultivars in crop management systems. (Same course as PLP 5613)

ENTO 5623* Advanced Biotechnology Methods. Lab 3. Prerequisite(s): BIOL 3653, BIOL 3023 or equivalent or consent of instructor. Overview of current theory and principles of biotechnology and laboratory experience with contemporary techniques and experimental methods used in biotechnology, including genome analysis, gene transfer, identification and isolation of genes and their products and regulation of gene expression in plants and arthropods. (Same course as PLP 5623)

ENTO 5644* Insect Morphology. Lab 4. Prerequisite(s): 2993 or equivalent. Insect development and comparative morphology. Offered in combination with 3644. No credit for both 3644 and 5644.

ENTO 5700* Teaching Practicum in Entomology. 1-6 credits, max 6. Prerequisite(s): Graduate student standing. Variable credit offering for graduate students who wish to develop skills in teaching, assessment and curriculum development working in conjunction with a primary instructor.

ENTO 5710* Advanced Medical and Veterinary Entomology. 1-5 credits, max 5. Prerequisite(s): 4854. Special problems in methods of disease transmission, animal parasitce and the relationships existing between parasite and host.

ENTO 5733* Insect Behavior and Chemical Ecology. Prerequisite(s): 2993 and CHEM 3015 or equivalent. Behavioral biology of insects. Ecological interactions among organisms mediated by naturally produced chemicals. An interface of ecology, behavior, physiology and chemistry with examples from animal families and their organisms. Origin, function, significance and utilization of semiochemicals such as pheromones and allelochemicals. No credit for students with credit in 4733.

ENTO 5753* Insecticide Toxicology. Prerequisite(s): Organic chemistry or 15 credit hours biology. Properties and mode of action of the major insecticidal materials. Assessment of their impact on the environment.

ENTO 5833* Insect Molecular Biology. Prerequisite(s): 2993 and BIOL 3024 or equivalent or consent of instructor. Concepts and methods in molecular biology with emphasis on genetics of insects. Application of molecular techniques in insect biology.

ENTO 5850* Epidemiology of Arthropod-Borne Diseases. 1-4 credits, max 4. Lab to be arranged. Prerequisite(s): 4854 or equivalent. The relationships existing between the hosts, arthropod vectors and causal agents of disease and the principles of disease prevention or suppression by the intelligent use of biological principles.

ENTO 5870* Scientific Presentations. 1-5 credits. Prerequisite(s): Consent of instructor. Preparation and delivery of scientific presentations including 50-minute seminars, 10-minute talks, and posters. (Same course as PLP 5870)

ENTO 5992* Career Skills and Professionalism for Scientists. Prerequisite(s): Graduate standing, Graduate major in science, emphasis in science-based fields, especially those nearing graduation. Skills needed for effective job application and interviewing, career development and advancement, communication with professional colleagues and the public, and personal and professional development and evaluation. (Same course as PLP 5992)

ENTO 6000* Doctoral Research and Dissertation. 1-10 credits, max 36. Prerequisite(s): MS in entomology or consent of major professor. Independent investigation under the direction and supervision of a major professor.

ENTO 6100* Advanced Insect Physiology. 1-5 credits, max 5. Prerequisite(s): 3044 or 5044 or equivalent. Special problems in advanced invertebrate physiology.

Entrepreneurship and Emerging Enterprise (EEE)

EEE 1010 Creativity, Innovation and Entrepreneurship. 1-3 credits, max 6. Examination of the creative process. Exploration of underlying premises of creativity, exposure to basic frameworks and concepts, and examination of obstacles to creativity. Emphasis on practical applications. Intended for students in Creativity, Innovation and Entrepreneurship Learning Community.

EEE 1020 Creativity, Innovation and Entrepreneurship II. 1-3 credits, max 6. Examination of the underpinnings of entrepreneurship and innovation as each relates to the creative process. An applied perspective is adopted in exploring the connections between creativity, innovation and entrepreneurship for students in Creativity, Innovation and Entrepreneurship Learning Community.

EEE 1661 Free Enterprise Essentials. An exploration of the free enterprise system on the basis of both wealth creation and societal justice.

EEE 2023 Introduction to Entrepreneurship. Lab 1. Focuses on both the entrepreneurial mindset and the process of launching and growing a new business. Reviews opportunities, innovation, new value creation, business context, existing firms and any area of business or life that pertains to entrepreneurship.

EEE 3020 Business Plan Laboratory. 1-3 credits, max 3. Provides any student regardless of background with a fundamental understanding of the logic and practice of a business plan and a knowledge of basic tools and concepts for putting together a great business plan for an original idea or concept. Applies to for-profit and non-profit ventures.

EEE 3023 Introduction to Entrepreneurial Thinking and Behavior. Prerequisite(s): Sophomore standing. Overview of entrepreneurial thinking and behavior and its role in our lives. Examination of what it takes to start and sustain new concepts and ventures. Central focus is on the issues surrounding effective implementation of the entrepreneurial process across a variety of contexts.

EEE 3033 (D) Women and Minority Entrepreneurship. The course covers race, gender, and ethnicity as factors that impact entrepreneurship. Students learn the theoretical underpinnings of minority and women and concepts and their opportunities, challenges, and strategies when creating ventures.

EEE 3090 Study Abroad in Entrepreneurship. Prerequisite(s): Consent of the School of Entrepreneurship Department Head. Participation in a School of Entrepreneurship Study Abroad program.

EEE 3123 Entrepreneurship and The Arts. Introduces entrepreneurship as a way of thinking and acting within the arts, including fine art, theatre, music and design. Key entrepreneurial competencies are explored, including opportunity recognition, risk management, resource leveraging, and innovation. No credit for students with credit in 5123.

EEE 3263 Entrepreneurial Marketing. Prerequisite(s): 3023, MKTG 3213 and completion of business core classes or instructor permission. Examination of the roles of marketing in entrepreneurial ventures and entrepreneurship in the marketing efforts of any organization. Emphasis on marketing as it relates to risk management, resource leveraging and guerrilla approaches. No credit for students with credit in EEE 5223 or MKTG 5223. (Same course as MKTG 3263)

EEE 3333 Launching a Business: The First 100 Days. Addresses operational challenges in launching a new venture in its very formative stage. Attention is devoted to business formation, risk management, recordkeeping, go-to-market strategy, contracts, facilities, dealing with suppliers, and intellectual property, among other issues. No credit for students with credit in 5333.

EEE 3403 Social Entrepreneurship. An examination of the application of entrepreneurship concepts and principles in addressing vexing social needs such as hunger, homelessness, environmental degradation, disease, domestic violence and inadequate access to education. Exploration of unique challenges in and approaches for developing and implementing viable business models for social ventures. Students may not take both EEE 3403 and EEE 5403* for credit.

EEE 3503 Designing, Prototyping, and Testing Creative Products. This course provides students’ a hands-on experience in making things. Students conceptualize, design, prototype, manufacture and sell a new product. The class exposes students to using 3D printers along with other makerspace tools. Students may not take both EEE 3503 and EEE 5503 for degree credit.

EEE 3513 Growing Small and Family Ventures. Prerequisite(s): 3023 or
instructor permission. Exploration of unique challenges involved when growing small and family-owned ventures. The life stages of emerging enterprises are examined. Issues addressed include resource needs, skill requirements, functional area development, and work-life balance.

EEE 3663 Imagination in Entrepreneurship. Prerequisite(s): 3023 or instructor permission. Exploration of creativity and ideation as they relate to entrepreneurship. Perspectives on opportunity discovery and assessment are examined. Theoretical and conceptual foundations for the application of creativity to business problem solving are investigated. No credit for students with credit in 5663.

EEE 3673 Business Model Discovery. Course teaches the fundamentals of testing the feasibility of a business idea and building an effective business model around a business concept.

EEE 3813 (H) The Entrepreneur: Hero or Villain. An exploration of the entrepreneur in both historic and contemporary settings through the lens of ideas, events, and fine arts.

EEE 4010 Special Topics in Entrepreneurship. 1-6 credits, max 6. Examination of entrepreneurship issues. Specific topics vary from semester to semester.

EEE 4080 Riata Internship Program. 1-6 credits, max 6. Prerequisite(s): Consent of the Director of the Riata Center for Entrepreneurship. Professionally supervised experience building career-related skills, interests and personal development while enhancing valuable contacts and references. Allows students to apply skills in real life projects with host companies. Periodic reports, both oral and written, required as specified by the instructor.

EEE 4113 Dilemmas and Debates in Entrepreneurship. Designed around a series of critical dilemmas confronted by entrepreneurs when creating and growing a venture. Entrepreneur students explore with the students the issues surrounding these dilemmas in a structured format.

EEE 4263 Corporate Entrepreneurship. Prerequisite(s): 3023 or instructor permission. Examination of the application of entrepreneurship concepts and behaviors within established organizations, assessment of factors contributing to a company’s entrepreneurial orientation, and identification of ways to foster higher levels of entrepreneurship within firms. No credit for students with credit in 5263.

EEE 4313 Emerging Enterprise Consulting. Prerequisite(s): 3023 and junior standing. Students nearing the end of their studies work in teams to address problems and opportunities within existing entrepreneurial ventures. Using an established methodology, teams work with local entrepreneurs in establishing priorities and producing tangible deliverables that solve business needs. No credit for students with credit in 5313.

EEE 4483 Entrepreneurship and New Technologies. Prerequisite(s): 3023 or instructor permission. Assessment of technologies and their marketplace potential. Issues in technology commercialization are examined from an entrepreneurial perspective. Students work on implementation issues surrounding actual emerging technologies originating at the university and in the surrounding community.

EEE 4513 Strategic Entrepreneurial Management. Prerequisite(s): Senior standing. The capstone integrative experience required of all business students culminating in the development of a comprehensive plan for a new business or nonprofit venture. All students complete in the Capstone Competition at the end of the semester.

EEE 4603 (I) Entrepreneurship Empowerment in South Africa. Prerequisite(s): Instructor permission. Introduction to the supporting emerging enterprises assessment model. Includes focused attention on consulting within all the functional areas of an emerging enterprise operating under conditions of adversity. Periodic guest lectures by subject matter experts. Exposure to the local customs, business environment, and culture of entrepreneurs in a South African context. No credit for students with credit in 5603.

EEE 4610 Entrepreneurship Practicum. 1-6 credits, max 6. Prerequisite(s): 3023 and instructor permission. Transfer of knowledge from entrepreneurship coursework into practice through hands-on experiences, such as business development consulting projects, management of a venture capital fund and creation of a student-owned business.

EEE 4653 Venture Capital. Prerequisite(s): 3023 or instructor permission. Approaches to raising and managing working capital in emerging enterprises. Examination of the various sources of funds for startup and early stage ventures. Attention devoted to determining financial needs of new ventures and formulating, determining valuations and formulating deal structures.

EEE 4703 Project Management for Entrepreneurship. Understanding invaluable basic project management skills for startup entrepreneurs and innovators within existing organizations (intrapreneurs) and to successfully manage projects in general. No credit for students with credit in EEE 5703.

EEE 4803 Operating an Entrepreneur Firm. Addresses how to develop and manage operations of an entrepreneurial firm in terms of inventory, manufacturing, building infrastructure, developing systems, etc. The objective is to familiarize students with unique issues facing the operations of a new business. (No credit for students with credit in 5803).

EEE 5080 * Riata Internship Program. 1-6 credits, max 6. Prerequisite(s): Consent of the Director of the Riata Center for Entrepreneurship. Professionally supervised experience building career-related skills, interests and personal development while making valuable contacts and references. Allows testing skills in real life projects with host companies. Periodic reports, both oral and written, required as specified by the instructor.

EEE 5100* Study Abroad in Entrepreneurship. Prerequisite(s): Consent of the School of Entrepreneurship Department Head. Participation in a School of Entrepreneurship sanctioned Study Abroad program.

EEE 5113* Entrepreneurship and Venture Management. Prerequisite(s): Admission to MBA program or instructor permission. Entrepreneur creation and growth experiences faced by entrepreneurs in early growth stages of business ventures. An interdisciplinary problem-solving approach with emphasis on case studies and plans for new business ventures.

EEE 5123* Entrepreneurship and The Arts. Explores entrepreneurship as a way of thinking and acting within the arts, including fine art, theatre, music and design. The application of entrepreneurial framework competencies within the arts is examined. Attention is devoted to opportunity recognition, innovation, creative problem-solving, risk assessment and management, resource leveraging and related entrepreneurial capabilities. No credit for credit in 5123.

EEE 5133* Dilemmas and Debates in Entrepreneurship. Prerequisite(s): Graduate standing. Designed around a series of critical dilemmas confronted by entrepreneurs when creating and growing a venture. Entrepreneur students explore with the students the issues surrounding these dilemmas in a structured format.

EEE 5200* Special Topics in Entrepreneurship. 1-6 credits, max 6. Prerequisite(s): Graduate standing. Examination of entrepreneurship issues. Specific topics vary from semester to semester.

EEE 5213* Entrepreneurship in Science and Technology. Assessment of technologies and their marketplace potential. Issues in technology commercialization are examined from an entrepreneurial perspective. Students work on implementation issues surrounding actual emerging technologies originating at the university and in the surrounding community. Students are specifically encouraged to enroll.

EEE 5223* Entrepreneurial Marketing. Prerequisite(s): Admission to MBA program or instructor permission. Interplay of entrepreneurship concepts and marketing concepts, including the role of marketing in entrepreneurial ventures, and the role of the entrepreneur in a firm’s marketing efforts. Emphasis is placed on how to address the significant changes taking place in markets and the modern marketing function. (Same course as MKTG 5223)

EEE 5263* Corporate Entrepreneurship. Prerequisite(s): Admission to MBA program or instructor permission. Examination of entrepreneurship concepts and behaviors within established organizations, assessment of factors contributing to a company’s entrepreneurial orientation, and identification of ways to foster higher levels of entrepreneurship within firms.

EEE 5313* Emerging Enterprise Consulting. Prerequisite(s): Admission to the MBA program or instructor permission. Using an established methodology, student teams work with local entrepreneurs in establishing consulting priorities within their ventures and producing tangible deliverables that solve business challenges. All facets of business are addressed.

EEE 5333* Launching a Business: The First 100 Days. Addresses operational challenges in launching a new venture in its very formative stage. Attention is devoted to business formation, risk management, record keeping, go-to-market strategy, contracts, facilities, dealing with suppliers, and intellectual property, among other issues. No credit for students with credit in EEE 3333.

EEE 5403* Social Entrepreneurship. Advanced level examination of entrepreneurship in the social or non-profit sector. Investigation of issues surrounding creation and operation of new ventures that address vexing social needs and opportunities. Explores the application of entrepreneurship concepts and principles in a social context. Students may not take both EEE 3403 and EEE 5403 for credit.

EEE 5493* Entrepreneurship and Architecture. Prerequisite(s): Admission to the MBA program or instructor permission. Examination of the role of entrepreneurship in the architecture profession, with direct application to architectural services, activities and products. Emphasis on implementing the entrepreneurial process in starting and sustaining new ventures that significantly shape the building environment. (Same course as ARCH 5493)

EEE 5503* Designing, Prototyping, and Testing Creative Products. This course provides students’ a hands-on experience in making things. Students conceptualize, design, prototype, manufacture and sell a new product. The course exposes students to using 3D printers along with other makerspace tools. Students may take both EEE 5503 and EEE 5513 for credit.

EEE 5513* Growing Small and Family Ventures. Prerequisite(s): 3023 or instructor permission. Exploration of unique challenges involved when growing small and family-owned ventures. The life stages of emerging enterprises are examined. Issues addressed include resource needs, skill requirements, functional area development, and worklife balance. No credit for credit in 3513.

EEE 5603* Entrepreneurship Empowerment in South Africa. Prerequisite(s): Instructor permission required. Introduction to the supporting emerging enterprises assessment model. Includes focused attention on...
consulting within all the functional areas of an emerging enterprise operating under conditions of adversity. Periodic guest lectures by subject matter experts. Exposure to the local customs, business environment, and culture of entrepreneurs in a South African context. No credit for students with credit in EEE 4603.

EEE 5610* Advanced Entrepreneurship Practicum. 1-6 credits, max 6. Prerequisite(s): 5113. Transfer of knowledge from entrepreneurship course work into practice through hands-on experiences, such as business development consulting projects, management of a venture capital fund, and creation of student-owned businesses.

EEE 5653* Venture Capital. Prerequisite(s): 5113, admission to MBA program or instructor permission. Venture capital investing and the business development process. Exploration of how startups and early stage firms determine money needs, obtain financing and structure deals. No credit for students with credit in EEE 4653.

EEE 5663* Imagination in Entrepreneurship. Prerequisite(s): Graduate standing. Exploration of creativity and ideation as they relate to the entrepreneurial process. Perspectives on opportunity discovery and assessment are examined. Theoretical and conceptual foundations for the application of creativity to business problem solving are investigated.

EEE 5703* Project Management for Entrepreneurship. Understanding invaluable basic project management skills for startup entrepreneurs and innovators within existing organizations (intrapreneurs) and to successfully manage projects in general. No credit for students with credit in EEE 4703.

EEE 5713* Native American Entrepreneurship. Understanding the impact entrepreneurship thinking and behavior can have for Native Americans. Strategies and tactics to increase the number of new business ventures launched by Native Americans. No credit for students with degree credit in EEE 3713.

EEE 5803* Operating an Entrepreneurial Firm. Addresses how to develop and manage operations of an entrepreneurial firm in terms of inventory, manufacturing, building infrastructure, developing systems, etc. The objective is to familiarize students with unique issues facing the operations of a new business. (No credit for students with credit in EEE 4803).

EEE 5863* CIE Scholar Practicum. Course teaches the fundamentals of testing the feasibility of a business idea and building an effective business model around a business concept.

EEE 5903* Applied Innovation I. Addresses business startup fundamentals, decision-making tools and theory of innovative problem solving. Students will have the opportunity to interact with South African and Central American students participating in summer programs allowing best practices and experiences with students from other cultures and countries.

EEE 5903* Preparing Effective Business Plans. Prerequisite(s): ACCT 5183, 5283, FIN 5013, MGMT 5113, EEE 5113, 5663 and 5333. The critical issues involved with developing a business venture, through the process of developing a comprehensive business plan including feasibility analysis, actual development of the plan, preparing to present the plan to investors.

EEE 6200* Entrepreneurship Research Project. Prerequisite(s): Admission to doctoral program and instructor permission. Directed research projects for doctoral students. Students conduct publishable research on leading issues in entrepreneurship.

EEE 6213* Entrepreneurship: Cross-Disciplinary Interfaces. Prerequisite(s): Doctoral standing and consent of instructor. Current research that addresses important entrepreneurial questions and assesses “gaps” in those literatures. Strategies will be proposed to address these gaps. Focuses on refining students’ skills in “mapping out” and writing research papers.

EEE 6335* Contemporary Research Topics in Entrepreneurship. Survey of the existing conceptual, theoretical, and practical links between entrepreneurship and other disciplines. Exploration of opportunities for cutting edge research on the boundaries of entrepreneurship and other disciplines.

EEE 6363* Individual Theories in Entrepreneurship Research. Prerequisite(s): Admission to doctoral program. Analysis of research and theories related to the individual entrepreneur.

Environmental Science (ENVR)

ENVR 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.

ENVR 3113 Sampling and Analyses for Solving Environmental Problems. Lab 3. Prerequisite(s): 1113 and CHEM 1215 or CHEM 1314 and BIOL 1114. Provide multiple examples for evaluating the evidence which documents environmental problems. Developing sampling skills required to obtain biological and physical data needed in the evaluation of environmental problems. Analyze biological and physical data using basic statistical methods and determine the 1) severity of water, soil, and air pollution, and 2) degree of ecosystem degradation. Present findings as written reports which emphasize the use of comparative graphs, tables, and figures.

ENVR 4010 Internships in Environmental Science. 1-6 credits, max 6. Prerequisite(s): Junior standing in environmental science or consent of instructor. Supervised internships with business, industry, or governmental agencies in environmental assessment and remediation.

EEE 5112 Land Measurement and Site Analysis. Lab 2. Prerequisite(s): MATH 1513 or equivalent. Techniques and approaches used to locate sites and evaluate physical conditions with the goal of collecting the required information for an environmental impact report; includes Public Land Survey System (PLSS), equipment selection and use, Global Positioning System (GPS), data collection and analysis, and mapping. (Same course as MCAG 4112)

ENVR 4363 Environmental Soil Science. Prerequisite(s): BIOL 1114 and SOIL 2124. Re-emphasis of soil science concepts vital in the understanding of processes that are within the realms of the ecological regulator function of the soil; discussions on the role of soil as the foundation of forest, rangeland/ pastureland, agricultural, urban and suburban, as well as wetland ecosystems; impact of soil processes on global environmental concerns; soil as the ultimate recipient of waste; impact of soil processes on groundwater and surface water quality. (Same course as SOIL 4363*)

ENVR 4500 Environmental Science Problems. 1-6 credits, max 6. Prerequisite(s): Upper-division standing, GPA of 2.50 or better, and consent of instructor. Individual or small group study of selected problems in environmental science. Course may be used twice for up to six credit hours to meet degree requirements.

ENVR 4512 Environmental Impact Analysis. Outline of the National Environmental Policy Act (NEPA) documentation of potential environmental impacts for decision makers. Development of environmental assessment, environmental impact statements, and categorical exclusion documents that result from the NEPA processes. Graded on a pass/fail basis.

ENVR 4511 Professional and Capstone Planning. Prerequisite(s): Senior standing. Preparation of a personal statement to communicate with environmental professionals and develop a written proposal to solve an environmental application or problem.

ENVR 4813 Environmental Science Applications and Problem Solving. Lab 4. Prerequisite(s): 4811 or consent of instructor. Team work on environmental problems, to develop solutions and communicate recommendations to professionals as part of a senior capstone project. Results are presented by oral and written reports directly to professionals.

ENVR 4893 Soil Chemistry and Environmental Quality. Prerequisite(s): SOIL 2124 and CHEM 1225. Chemical and colloidal properties of clays and organic matter in soil and sediments, and to increase the number of new students, including exchange, retention, and precipitation; soil acidity and salinity; minerals weathering and formation; oxidation-reduction reactions; trace and toxic elements, water quality, land application of wastes, and soil remediation. (Same course as SOIL 4893*)

ENVR 4913 Animal Waste Management. Prerequisite(s): SOIL 2124. Aspects of animal waste management related to animal nutrition, system design, land application, socioeconomic issues and environmental impacts. (Same course as ANSI 4913* and SOIL 4913*)

ENVR 5000* Master’s Thesis. 1-3 credits, max 6. Prerequisite(s): Approval of advisory committee and departmental steering committee. Research leading to master’s thesis or report.

ENVR 5050* Readings in Environmental Science Topics. 1-3 credits, max 9. Prerequisite(s): Consent of the instructor. This course provides an avenue for masters students to extend their knowledge of Environmental Science topics not covered in other courses. This course is not available for doctoral students.

ENVR 5123* Environmental Problem Analysis. This course reviews the process of environmental problem analysis using current practical examples. This course draws on theories from various disciplines and applies appropriate techniques of analysis.

ENVR 5200* Special Topics in Environmental Science. 1-4 credits, max 10. Prerequisite(s): Graduate standing. Topics and issues in the broad field of environmental science. Group discussions and projects not covered by existing courses such as ecological risk assessment, water chemistry and environmental law.

ENVR 5210* Seminar in Environmental Science. 1-3 credits, max 6. Prerequisite(s): Consent of the instructor. This seminar is offered as a special topics course for masters students. The theme of the seminar will vary in accordance with recent advances in environmental science and the interests of the faculty instructor.
ENVR 5303* Issues in Environmental Sustainability. The course reviews human-nature relationships and how they affect the ability of future generations to sustainably improve their quality of life. The course also considers the importance of environmental stewardship that can contribute to sustainability. In-class and/or online discussions of issues, guest presentations by outside experts, and reports on selected topics are included.

ENVR 5313* Clean Air Act: Regulation, Compliance and Reporting. This course will present an overview of the Federal Clean Air Act including regulations, history, regulations, key concepts such as technology force, enforceability and adequate margin of safety. This course addresses the preparation of emissions calculations for reporting and permitting, discussion of emissions monitoring and control technologies, and review of reporting requirements and legal standards for compliance. Course will focus on U.S. Federal and State application.

ENVR 5353* Environmental Outreach and Education. Techniques for environmental education and outreach programs for adults and children in the classroom and in the public arena.

ENVR 5443* Hazardous Waste Regulations for Environmental Managers. Covers air, water and waste permitting and plans as well as DOT transportation of hazardous materials and several OSHA standards.

ENVR 5453* Bioremediation for Environmental Managers. Teaches the fundamental biological mechanisms that allow microorganisms and plants to degrade and/or remove contaminants from the environment.

ENVR 5503* Environmental Management Practicum. Prerequisite(s): 18 graduate credit hours. This course explores methods of analyzing sustainable solutions to complex environmental, safety and health problems using an integrated team approach. This approach combines technical, legal, economic, and sociopolitical information into a coherent analytical framework. Required for masters students pursuing a plan of study in environmental management.

ENVR 5510* Environmental Management Internship. 3 credits, max 6. Prerequisite(s): 5503 and consent of program director. The student must identify and solve an environmental problem under the supervision of a competent professional environmental manager, and submit and defend a formal report presenting the problem, solution analysis methodologies, and recommended solution. The internship must involve at least 240 contact hours with the manager. The course is required of all masters students pursuing a plan of study in environmental management.

ENVR 5523* Industrial Ecology for Environmental Scientists. Prerequisite(s): General biology. Provides students with an overview and broad understanding of ecology principles as applied to an industrial setting. The course begins with an overview of general ecological principles such as ecosystem components and structures, biogeochemical cycles, energy flows, and properties of populations. The course concludes with a consideration of industrial ecology principles such as sustainability, pollution prevention, life cycle assessment and waste minimization.

ENVR 5533* Genres of Environmental Writing. This course focuses on three written genres: proposals, reports and academic articles. Students will learn the basic structure. Methods, Results, and Discussion (RMRD) structure. This structure is the basis of workplace reports and research articles in a wide variety of academic disciplines. Students will examine how the language features and organizational structure of these documents are influenced by their audience and context.

ENVR 5543* Environmental Management Systems. Prerequisite(s): 5303 or equivalent knowledge with consent of instructor. This course introduces strategies for the design and operation of environmental management systems that reduce environmental impacts in conformance with ISO 14000 standards. Topics include aspect identification, impact assessment, impact reduction strategies, and management oversight. Other topics such as training, internal and external auditing, and integration with other management programs will also be addressed.

ENVR 5553* Applied Standards for Environmental Managers. Foundational understanding of the complex regulatory framework related to waste management.

ENVR 5633* Physical Geology for Environmental Managers. Overview of the physical and chemical nature of the solid and fluid earth. Focuses on how these physical attributes and processes influence interactions between humans and the natural environment.

ENVR 5703* Chemical Aspects of Environmental Science I. Prerequisite(s): CHEM 1225, MATH 2155. For non-chemists with a basic understanding of industrial environmental chemistry. For the environmental professional student in the calculations required for permitting, such as the Clean Water Act. Course includes the interpretation of basic chemical and physical properties of materials. The course includes an introduction to basic chemical analysis, and fundamental principles of analytical chemistry.

ENVR 5713* Chemical Aspects of Environmental Science II. Prerequisite(s): A continuation of 5703. Application of analytical methods for environmental monitoring, environmental sampling, chemical wastewater treatment, fugacity (air emission calculations) and environmental chemical analysis.

ENVR 5733* Environmental Site Assessment. This course introduces concepts associated with conducting environmental site assessments (ESAs) and contaminant remediation. Topics include review of federal regulations regarding site assessments, an overview of Phase I and Phase II ESA methodologies, proper soil/water sampling techniques, soil/geochemistry/hydrogeology principles relating to environmental assessments, and various remediation strategies. The course includes field exercises simulating Phase I and Phase II ESA investigations, interpretation of historical aerial photos, and wetland identification.

ENVR 5743* Environmental Impact Assessment. This course teaches students how to understand and apply the National Environmental Policy Act to evaluate and document potential environmental impacts for decision makers. The course reviews the development of environmental assessments, environmental impact statement and categorical exclusion documents that result from the NEPA process. Emphasis is placed on the development of an environmental assessment program.

ENVR 5753* Environmental Site Remediation. Introduction to concepts associated with environmental site remediation. Emphasis will be placed on the application and assessment of site clean-up.

ENVR 5823* Watershed Management. This course provides an overview of watershed management that integrates law, politics, economics, watershed science, engineering, education, social marketing, and conflict resolution. Students will also learn how to critically evaluate watershed management programs. Field trips to watersheds are included.

ENVR 5853* Field Stream Assessment. Techniques for evaluating the health of streams. Laboratory techniques for fish and aquatic insect collection, habitat assessments, chemical water quality analysis, and stream integrity measurement.

ENVR 6000* Doctoral Research for Dissertation. 1-12 credits, max 24. Prerequisite(s): Approval of advisory committee. Research leading to the PhD dissertation.

ENVR 6011* Survey of Environmental Science. This course introduces newly admitted environmental science students to environmental research conducted by faculty at OSU. The course also helps students prepare interdisciplinary plans of study that support their professional and research goals. It is required of all ES doctoral students during their first year of enrollment. The course may also be taken by ES masters students, but is not required.

ENVR 6023* Research Methodologies in Environmental Science. Prerequisite(s): Permission of student’s research adviser. Introduction to research techniques and literature in environmental science for doctoral students.

ENVR 6031* Interdisciplinary Research Report Preparation. Prerequisite(s): 6003 or AGED 5983 and permission of the student’s research adviser. This course teaches students how to prepare and defend interdisciplinary dissertations. Students will learn how to interpret results, articulate findings, justify conclusions, and identify implications. They will also learn how to deliver professional conference presentations and write professional papers. The course requires permission of the student’s research adviser. The course is required of all ES doctoral students just before they intend to prepare and defend their dissertations. ES master’s students who want to learn more about preparing and defending a thesis may also enroll.

ENVR 6201* Advanced Readings in Environmental Science. 1-3 credits, max 9. Prerequisite(s): Consent of the instructor. Provides an overview for doctoral students to extend their knowledge of environmental science topics not covered in other courses.

ENVR 6210* Advanced Seminar in Environmental Science. 1-3 credits, max 9. Prerequisite(s): Consent of the instructor. Provides an overview for doctoral students to extend their knowledge of environmental science topics not covered in other courses.

ENVR 6300* Doctoral Research for Dissertation. 1-12 credits, max 24. Prerequisite(s): Approval of advisory committee. Research leading to the PhD dissertation.

ENVR 6353* Advanced Topics in Environmental Science. 1-3 credits, max 6. Prerequisite(s): 24 credit hours of graduate credit and permission of instructor. This course covers current topics and issues in environmental science. Though the topics will vary, each course will typically include environmental assessment, environmental sustainability and environmental policy. Group discussions and team projects may be assigned.

ENVR 6503* Advanced Environmental Management Practicum. Prerequisite(s): 30 graduate credit hours. This course covers current topics and issues in environmental science. Though the topics will vary, each course will typically include environmental assessment, environmental sustainability and environmental policy. Group discussions and team projects may be assigned.

ENVR 6516* Advanced Environmental Management Internship. 6 credits. Prerequisite(s): 6503 and consent of program director. The student must identify and solve an environmental problem in collaboration with a competent professional environmental manager, and submit and defend a formal report presenting the problem, problem and solution analysis...
methodologies, and recommended solution. The internship must involve at least 480 contact hours with the manager. The course is an experience for all ES doctoral students pursuing a plan of study in environmental management.

ENVR 6623 * Social Aspects of Environmental Planning. This course develops students’ theoretical and practical understanding of social aspects of environmental planning. The course addresses topics such as social impact assessment, the role of public involvement, environmental justice, and other social considerations in the implementation of environmental programs. It will also demonstrate the application of social science techniques in environmental planning and prepare students for the application of social perspectives in environmental decision-making - in both the public and private sectors.

Finance (FIN)

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.

FIN 3113 Finance. Prerequisite(s): STAT 2203; and ACCT 2203 or concurrent enrollment; and ECON 2203 or concurrent enrollment. Operational and strategic financial problems including allocation of funds, asset management, financial information systems, financial structure, policy determination and analysis of the financial environment.

FIN 3613 General Insurance. Prerequisite(s): 3113. Introduction to the theory and general principles of insurance. A broad analysis of the elements and operation of personal, liability, casualty, health and life insurance.

FIN 3713 Real Estate Investment and Finance. Prerequisite(s): 3113. An introductory course in real estate investment and finance. Financing real estate, financial leverage and financial planning, the institutional structure of mortgage lending, managing risks, investment strategies and decisions.

FIN 4063 Applied Financial Studies. Prerequisite(s): Consent of the instructor. Structured internship or field project with supporting academic study.

FIN 4113 Financial Markets and Institutions. Prerequisite(s): 3113, and ECON 3313 or concurrent enrollment in ECON 3313. Money and capital markets, flow-of-funds, commercial banks and other financial intermediaries.

FIN 4213 International Financial Management. Prerequisite(s): 3113 or consent of instructor. Financial management topics unique to business firms operating in an international environment. Topics include global economic and business environments, international monetary system, foreign exchange markets, foreign exchange risk and management, foreign direct investment, and trade finance. Recent and current international financial events.

FIN 4223 Investments. Prerequisite(s): 3113. Various approaches to selecting and timing investment opportunities, e.g., common stocks, bonds, commodities and options. Modern concepts of portfolio theory.

FIN 4333 Financial Management. Prerequisite(s): 3113 or consent of instructor. Theories and practice applicable to the financial administration of a business. A variety of teaching methods used in conjunction with readings and cases to illustrate financial problems and techniques of solution.

FIN 4363 Energy Finance. Prerequisite(s): 3113. Introduction to basic terminology, industry structure, and supply and demand outlook in the oil, gas and power industries. A broad analysis of applications in the energy industry including financial statement analysis, valuation, risk analysis in the total, budgeting, risk management, alternative energy topics and energy specific case studies.

FIN 4443 Banking Strategies and Policies. Prerequisite(s): 3113, and ECON 3313 or concurrent enrollment in ECON 3313. Theories and practices of bank asset management; banking markets and competition.

FIN 4453 Bank Decision Simulation and Analysis. Prerequisite(s): 3113 and 4443. Students team 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.

FIN 4550 Selected Topics in Finance. 1-6 credits, max 6. Prerequisite(s): 3113 or consent of instructor. Advanced topics in finance. Topics are updated each semester.

FIN 4563 Bond Markets. Prerequisite(s): 3113 and 4113. Provides a broad introduction to treasury, corporate, municipal, mortgage backed, and international bond markets. The analytic techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Concepts are applied through case studies and projects.

FIN 4763 Financial Futures and Options Markets. Prerequisite(s): 3113 and 4223. Foundation in financial futures and options markets. A balance of institutional detail necessary to understand the structure of these markets and the theoretical developments necessary to apply the contracts to various uses. The use of financial futures and options to manage price risk.

FIN 4813 Portfolio Management. Prerequisite(s): 3113 and 4223 with a grade of “C” or better and consent of instructor. Overview of portfolio management from the point of view of a trust officer, mutual fund manager, pension fund manager, or other manager of securities. Emphasizes the need of financial managers for an understanding of problems, trends, and theory of portfolio management.

FIN 4843 Risk Management. Prerequisite(s): 3113 and 4223. Introduction to relevant analytical tools necessary for the effective management of risk.

FIN 4913 Advanced Risk Management. Prerequisite(s): 3113, 4223, 4763, and 4443 (with a grade of “C” or better). Applications of risk management concepts and skills for the development of programs to manage risk exposures.

FIN 5000* Master’s Research and Thesis. 1-6 credits, max 6. Prerequisite(s): Good standing in Master of Science in quantitative financial economics program and consent of program coordinator. Research and thesis for master’s students.

FIN 5010* Finance Projects and Independent Studies. 1-6 credits, max 6. Prerequisite(s): Good standing in graduate program and consent of project adviser and consent of department head. Graduate projects and independent study in finance.

FIN 5013* Business Finance. Prerequisite(s): Admission to a SSB graduate program and ACCT 5183 or equivalent, or consent of MBA director or instructor. Introduction to the major areas of business finance: the financial environment in which businesses are made and the institutions found therein, the financial management practices of a firm securing financing and allocating resources among competing alternatives, and the valuation of financial assets to the firm and individuals.

FIN 5053* Theory and Practice of Financial Management. Prerequisite(s): Admission to a SSB graduate program and FIN 5013 or equivalent and ACCT 5183 or equivalent or consent of the MBA director or instructor. Concepts and theories applicable to the financial administration of a firm. Cases, problems and readings to illustrate various financial problems and techniques of solution.

FIN 5153* Corporate Financial Strategy. Prerequisite(s): Admission to a SSB graduate program and FIN 5013 or equivalent and ACCT 5183 or equivalent of MBA director or instructor. Strategic financial decisions and their implementation, including capital structure policy, capital budgeting, risk assessment and management, corporate restructuring, management performance assessment, cost of capital, financial resource planning, dividend policy, and capital raising. Familiarity with basic financial tools and techniques including time value of money, asset pricing and security valuation, and financial statement analysis.

FIN 5213* International Business Finance. Prerequisite(s): 5013. Theories and financial management practices unique to business firms which operate in, or are influenced by, an increasingly global economic environment.

FIN 5223* Investment Theory and Strategy. Prerequisite(s): Admission to a SSB graduate program, 5013 or the consent of MBA director or the instructor. Selected investment topics and advanced portfolio management techniques.

FIN 5243* Financial Markets. Prerequisite(s): 5013. An analysis of the structure of financial markets, the determination and behavior of interest rates, the functioning of and the flow of funds.

FIN 5333* Corporate Governance. Prerequisite(s): 5013. The theoretical and applied analysis of the governance structure of a corporation. The interconnections of the board of directors, CEO, management and shareholders. Case problems and readings address the advantages and disadvantages of various corporate governance practices.

FIN 5550* Special Topics in Finance. 1-6 credits, max 12. Prerequisite(s): Consent of instructor. Theoretical and applied aspects of specialized financial areas. Evaluation of models, current trends and problems.

FIN 5763* Derivative Securities and the Management of Financial Risk. Prerequisite(s): 5013 or consent of instructor. A survey of financial instruments that are influenced by, or are available to, a corporation. A study of how financial derivatives are used in financial planning, dividend policy, and capital raising.

FIN 5773* Financial Engineering. Prerequisite(s): MATH 4513 and FIN 5763 or consent of instructor. Techniques for the design, development and implementation of innovative financial instruments and processes to the formulation of creative solutions of problems in finance.

FIN 5883* Quantitative Financial Applications. Prerequisite(s): 5223 and consent of the head of the department. Application of financial solution techniques through directed case work in appropriate business and public sector settings. Simulation, small group instruction and field-based experiences.

FIN 6053* Financial Theory and Corporate Policy. Prerequisite(s): Consent of the instructor. Theoretical and empirical underpinnings of modern corporate finance.
Fire Safety and Explosion Protection (FSEP)

FN 660* Seminar in Fire Science. 3-5 credits, max 12. Prerequisite(s): Consent of instructor. Advanced research with emphasis on theoretical problems and solutions. Selected topics covered.

Fire Protection and Safety Technology (FPST)

FPST 1213 Fire Safety Hazards Recognition. "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. Prerequisite(s): Consent of department head. Special technical problems in fire protection and safety.


FPST 2050 Studies in Loss Control. 1-4 credits, max 6. Prerequisite(s): Consent of instructor and adviser. Problems in applied fire protection technology, occupational safety, industrial hygiene or hazardous materials management of particular interest to the loss control specialist.

FPST 2153 Fire Protection Management. Applied human relations, technical knowledge and skills for achieving optimum effectiveness from a fire protection organization.

FPST 2243 Design and Analysis of Sprinkler Systems. Lab 3. Prerequisite(s): Grade of "C" or better in FPST 1373, FPST 2483, ENGR 1322 or GENT 1153. Detailed current standards for selection, design, installation, operation and maintenance of automatic fire suppression systems. Laboratory problems on applicable technological principles.

FPST 2344 Components of Industrial Hygiene. Lab 3. Prerequisite(s): Grade of "C" or better in STAT 2013, CHEM 1515 or CHEM 1225 or CHEM 1414. Toxic or irritating substances, physical, biological, ergonomic and other occupational stress factors causing employee illness or discomfort. Environmental pollution sources and controls.

FPST 2483 Fire Protection Hydraulics and Water Supply Analysis. Lab 3. Prerequisite(s): Prior or concurrent enrollment in FPST 1373 and MATH 1513. Fluid flow through fire pump supplies, pumps and fire protection appliances. Water supply and distribution analysis using hydraulic calculations. Testing techniques to detect anomalies in design or performance capabilities.

FPST 2650 Technical Problems and Projects. 1-4 credits, max 4. Special problems or projects assigned by advisers with the approval of the department head. A comprehensive written report or equivalent creative effort.

FPST 3013 Safety Management. Prerequisite(s): ENGL 1113 or ENGL 1123 or ENGL 1131. Understanding and implementing techniques for a safer work environment. Recognition, evaluation and control of occupational health and safety hazards. Accident prevention, accident analysis, training techniques, workers' compensation insurance, guarding and personal protective equipment.

FPST 3113 Advanced Extinguishing Systems Design and Analysis. Prerequisite(s): 2483, 2243. Automatic fixed fire-extinguishing systems and water supply systems. Emphasis upon computer assistance through use of existing design programs.

FPST 3143 Structural Designs for Fire and Life Safety. Prerequisite(s): Grade of "C" or better in 1213, 1373, 2423 and GENT 2323 or ENSC 2113. Building construction standards and codes to assure maximum life and property safety from fires, explosions and natural disasters. Egress design specifications, occupancy and construction classifications and fire protection requirements for building construction and related materials.

FPST 3213 Human Factors in Accident Prevention. Prerequisite(s): Grade of "C" or better in FPST 2344, STAT 2013, and GENT 2323 or ENSC 2113. Human factors and workplace ergonomics as it relates to the prevention of accidents and workplace injuries. Fundamentals and techniques of task analysis.

FPST 3233 Radiological Safety. Lab 2. Ionizing radiation problems; detection and measurement of hazards and exposure limiting, radiation health aspects, storage, handling and disposal.

FPST 3373 Fire Dynamics. Lab 3. Prerequisite(s): Grade of "C" or better in CHEM 1515 or CHEM 1225 or CHEM 1414, MATH 2133 or MATH 2153, STAT 2133, FPST 2483, GENT 3433 or ENSC 2213 or GENT 4433. Fundamental thermodynamics of combustion, fire chemistry and fire behavior. The physical evidence left by fire for investigation and the use of computer models to study fire behavior.

FPST 3383 Building Electrical Systems. Prerequisite(s): 1373. Detail current standards for design, selection and installation of electrical distribution ad utilization equipment. Emphasis on personnel safety and fire prevention using current codes and standards.

FPST 3713 Hydraulic Design of Automatic Sprinkler Systems. Prerequisite(s): 1373, 2483, MATH 1513. Hydraulic calculation technique for the design and analysis of automatic sprinkler fire extinguishing systems.

FPST 3723 Industrial Fire Pump Installations. Prerequisite(s): 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.

FPST 3733 Sprinkler System Design for High Piled and Rack Storage. Prerequisite(s): 2243, MATH 1513. Specific design techniques for sprinkler system protection of commodities stored in solid piles or racks over 12 feet in height.

FPST 4050 Special Problems in Loss Control. 1-4 credits, max 6. Prerequisite(s): Consent of department head. Special technical problems in fire protection and safety.

FPST 4143* Industrial Ventilation and Smoke Control. Prerequisite(s): Grade of "C" or better in FPST 2344 and FPST 2483 and FPST 3373. Principles of dilution and comfort ventilation; heat-cold stress control, system design, contaminant control; ventilation system testing and guidelines. Design and analysis of smoke management systems in buildings for survivability and safe egress. Assessment of human health hazards posed by smoke. Performance characteristics of smoke control systems.

FPST 4153 Issues in Local Government and Fire Services. Prerequisite(s): 2344, 3013, 3143, and STAT 2013 or 4013 or 4033 or consent of instructor. Fire and Safety techniques to anticipate, recognize and control hazards. Fault Tree, HazOp, FMEA and other process safety techniques.

FPST 4333 System and Process Safety Analysis. Lab 3. Prerequisite(s): Grade of "C" or better in FPST 2344, STAT 2013, and ENGR 4142 or EET 1003. Fire and safety techniques to anticipate, recognize and control hazards. Fault Tree, HazOp, FMEA and other process safety techniques.

FPST 4383* Fire and Safety Simulation Modeling. Prerequisite(s): Grade of "C" or better in FPST 3373 and STAT 2013 or consent of instructor. Zone and field simulation modeling techniques for building fire safety assessment. Monte Carlo models, probability distributions for risk modeling, input data for risk modeling, and risk modeling software. Analysis and interpretation of simulation modeling output. Simulation model is required for successful course completion.

FPST 4403 Hazardous Materials Incident Management. Lab 3. Prerequisite(s): Grade of "C" or better in FPST 2023, FPST 2444, and CHEM 1515 or CHEM 1225 or CHEM 1414. An interdisciplinary approach to hazardous materials incident management. Legislative requirements. Emphasis on comprehensive safety and health program compliance relating to hazardous materials incidents or waste sites. Regulatory content of instructor. Selected related inspections, incident modeling, and use of environmental safety software for problem solving and decision making.

FPST 4683 Industrial Loss Prevention. Lab 3. Prerequisite(s): Prior or concurrent enrollment in all other required FPST courses and grade of "C" or better in ENGL 3323, or consent of instructor. Identification of loss control specialist.

FPST 4993 Advanced Fire and Safety Problems. Prerequisite(s): Grade of "C" or better in FPST 3013, ENGL 3323, or Grade of "C" or better in FPST 3733 and FPST 3373. Principles of industrial operations and processes to identify and mitigate related hazards. Emphasis on fire protection methods and related control measures, fire detection, suppression, and mitigation of energetic materials. Principles of energetic materials and their relationship to their surroundings. The requirements for detection, suppression, and mitigation of energetic materials.

FPST 5113* Critical Infrastructure Vulnerability and Risk. Prerequisite (s): 30 credit hours of STEM coursework or instructor consent. 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 or explosion.

FPST 5123* Fire and Explosion Detection and Mitigation. Prerequisite (s): 30 credit hours of STEM coursework or instructor consent. Chemistry and physics of energetic materials in their relationship to their surroundings. The requirements for detection, suppression, and mitigation of energetic materials.

FPST 5133* Principles of Industrial and Process Safety. Prerequisite (s): 30 credit hours of STEM coursework or instructor consent. Systematic assessment of industrial operations and processes to identify and mitigate related hazards. Improve skills in qualitative and quantitative analysis such as fault trees, HAZOP studies, and MORT charts.

FPST 5143* Structural Design for Fire and Life Safety. Prerequisite (s): 30 credit hours of STEM coursework or instructor consent. Building construction standards and codes to assure maximum life and property safety from fires, explosions and natural disasters. Egress design specifications, human factors and fire and explosion protection requirements for building construction and materials.

FPST 5153* Critical Infrastructure Vulnerability and Risk. Prerequisite (s): 30 credit hours of STEM coursework or instructor consent. Identification of critical infrastructure and the societal risk caused by its vulnerability. Methods of analyzing the hazards and threats facing critical infrastructure components and the methods of minimizing those risks.
FSEP 5163* Principles of Industrial, Physical and Building Security. Prerequisite(s): 30 credit hours of STEM coursework or instructor consent. Introduction to homeland security and the concept of integrated physical protection. Principles of industrial and building security, security management systems, security standards, and securing against asymmetrical threats.

Food Science (FDSC)

FDSC 1133 Fundamentals of Food Science. Food industry from producer to consumer and the current U.S. and world food situations.

FDSC 2103 (D) Regional Diversity in Food Production, Selection and Consumption. Examines the diversity of peoples associated with food production, selection, and consumption in the United States. Evaluate the cultural diversity in food production workplace and economic and social factors that influence this diversity. Examine various food selection and consumption criteria of varying contemporary cultures based on economic, social, and religious considerations.

FDSC 2233 The Meat We Eat. Overview of all animal, poultry, and fish protein sources used for human consumption, but focusing on red meat. Examination of each phase of production, inspection, safety, grading, processing, preparation, and current issues of the industries. Development of an understanding of the importance of meat in the diet and part of global agriculture. Same course as ANSI 2233.

FDSC 2253 Meat Animal and Carcass Evaluation. Lab 2. Prerequisite(s): ANSI 1124. Evaluation of carcasses and wholesale cuts of beef, pork, and lamb. Factors influencing grades, yields, and values in cattle, swine, and sheep. (Same course as ANSI 2253)

FDSC 3033 Meat Technology. Lab 3. The basic characteristics of meat and meat products as they relate to quality. Product identification, economy, nutritive value, preservation, and utilization. No credit for students with credit in ANSI 2253 or 3333.

FDSC 3113 Quality Control. Lab 2. Prerequisite(s): Introductory microbiology and organic chemistry. Application of the principles of quality control in food processing operations to maintain the desired quality of level.

FDSC 3123 HACCP in the Food Industry. Fundamentals of HACCP (Hazard Analysis and Critical Control Points), function of a HACCP system and implementation of HACCP in the food industry.

FDSC 3133 Plant Sanitation for Food Processing Operations. Sanitation and safety of food produced in food establishments, including government recommendations and regulations and illustration of voluntary and mandatory guidelines.

FDSC 3154 Food Microbiology. Lab 4. Prerequisite(s): Introductory microbiology and organic chemistry. Relationship of microorganisms to food manufacture and preservation, to food spoilage and microbial food poisoning and to various aspects of primary food production. (Same course as MIRC 3154)

FDSC 3232 Advanced Meat Evaluation. Lab 4. Prerequisite(s): 2253. Advanced evaluation of carcasses and wholesale cuts of beef, pork and lamb. (Same course as ANSI 3232)

FDSC 3310 Advanced Competitive Evaluation. Lab 6. Prerequisite(s): Consent of instructor. Advanced competitive evaluation in animal and/or product evaluation. For students competing on collegiate judging teams. (Same course as ANSI 3310)

FDSC 3333 Meat Science. Lab 3. Prerequisite(s): ANSI 2253, CHEM 1215 or equivalent. Anatomical and basic chemical and physical characteristics of meat animals studied. The application of scientific principles to the processing and economical utilization of meat animals, as well as in the manufacture of meat products emphasized in the laboratory. (Same course as ANSI 3333*)

FDSC 3373 Food Chemistry I. Lab 2. Prerequisite(s): ANSI 3543 or organic chemistry. Basic composition, structure, and properties of foods and the chemical changes or interactions that occur during processing and handling.

FDSC 3503 Processing Dairy Foods. Lab 2. Prerequisite(s): Organic chemistry. Theory and practice in formulation and processing: butter and margarine, cottage cheese, blue and processed cheeses, evaporated and sweetened condensed milk, ice cream, ice milk, and other frozen desserts.

FDSC 4113 Quality Control II. Prerequisite(s): FDSC 3113 and FDSC 3123. Verification and validation of the principles of Food Processing Quality Systems to confirm that quality and food safety systems have been implemented adequately and are effective. Topics include: food allergens, internal auditing and implement food safety and food quality programs to ensure consumer protection and prevent economic loss to the industry.

FDSC 4123* Principles of Food Engineering. Prerequisite(s): 1513. For non-engineers. Application of the engineering approach to solving heat and mass transfer problems in food processing. An introduction to the basic concepts of the conservation laws, fluid flow, heat transfer, refrigeration, freezing, psychrometrics, and energy conservation. (Same course as M CaG 4123)

FDSC 4153* Advanced Food Microbiology. Prerequisite(s): FDSC 3154 or MIRC 3154. Detection of foodborne pathogens, how pathogens cause disease, conduct investigations into foodborne illnesses, and antimicrobials to control foodborne pathogens.

FDSC 4253* Pre-harvest Food Safety. Prerequisite(s): FDSC 3154 or MIRC 3154. Microbial food safety at pre-harvest level. Types, sources, and concentrations of disease-causing pathogens in the food-producing animal environments and fresh produce/seafood environments; methods to control or reduce foodborne pathogens; present and future pre-harvest food safety directions.

FDSC 4333* Processed Meat. Lab 3. Prerequisite(s): ANSI 3033 or 3333. Meat and meat product composition. Techniques in the molding and forming of meat; sausage formulation; curing; quality control; and cost analysis. (Same course as ANSI 4333*)

FDSC 4373 Food Chemistry II. Lab 2. Prerequisite(s): 3373. Chemical/biochemical mechanisms that affect the structures and properties of foods during processing and handling. No credit for S373.

FDSC 4763* Analysis of Food Products. Lab 2. Prerequisite(s): Organic chemistry. Application of quantitative chemical and physical methods of analysis to the examination of foods.

FDSC 4900 Special Problems. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. A detailed study of an assigned problem by a student wishing additional information on a special topic.

FDSC 4910 Food Industry Internship. 1-12 credits, max 12. Prerequisite(s): Consent of instructor. Full-time internship at an approved production, processing or agribusiness unit or other agency serving the food industry. Maximum credit requires a six month internship in addition to a report and final examination. Graded on a pass-fail basis.

FDSC 5000* Master’s Research and Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of major adviser. Research for Master of Science degree in Food Science planned, conducted and reported under guidance of major adviser.

FDSC 5102* Ethics and Professionalism in Animal and Food Science. Discussion of regulations, laws, and resources; insights on complex ethical issues, including but not limited to research misconduct, how to address, report and find resources during cases of misconduct, conflicts of interest, and authorship; communication of research accurately and objectively to different audiences. Same course as ANSI 5102.

FDSC 5120* Special Topics in Food Science. 1-4 credits, max 8. Prerequisite(s): Graduate standing and consent of instructor. Advanced topics and new developments in food science.

FDSC 5213* Advances in Meat Science. Prerequisite(s): BIOC 4113 and ZOOL 3004 or equivalent. Development of muscle and its transformation to meat. Properties of meat and their influence on water-binding, pigment formation, texture, and fiber characteristics. (Same course as ANSI 5213*)

FDSC 5300* Food Science Seminar. 1 credit, max 3. Prerequisite(s): Graduate standing. Maximum two credit hours for MS degree. Maximum three credit hours for PhD degree. Critical reviews or studies of the scientific research literature related to the field of food science. Oral reports or group discussions.

FDSC 5333* Carcass Value Estimation Systems. Prerequisite(s): Graduate classification. Analysis of scientific literature regarding carcass composition, quality and palatability. Overview of technology used to evaluate carcass quality factors. (Same course as ANSI 5333*)

FDSC 5373* Advanced Food Chemistry. Lab 2. Prerequisite(s): FDSC 3373. Chemical/biochemical mechanisms that affect the structure and properties of foods during processing and handling.

FDSC 5393* Issues in Food Science. Prerequisite(s): Graduate classification. Critical analysis of issues and challenges in the U.S. food industry. Advanced forms of communication to effectively convey information to stakeholders and advocate for a position.

FDSC 5553* Interpreting Animal and Food Science Research. Prerequisite(s): STAT 5013 or concurrent enrollment. Critical evaluation and knowledgeable communication on the design, analyses, and reporting of animal science and food science research. (Same course as ANSI 5553)

FDSC 6000* Doctoral Research and Dissertation. 1-10 credits, max 30. Prerequisite(s): MS degree or consent of major adviser. Independent research for PhD degree in Food Science planned, conducted and reported in consultation of a major professor.

Foreign Languages and Literature (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: French, German, Greek, Japanese, Latin, Russian and Spanish. These languages are listed in alphabetical order.

FLL 1000 Special Studies in Foreign Languages and Literatures. 1-10 credits, max 10. Special studies in areas not regularly offered; basic level. Not for native speakers per University Academic Regulation 4.9.

FLL 2000 Special Study in Foreign Languages and Literatures: Intermediate. 1-5 credits, max 10. Prerequisite(s): 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. Not for native speakers per University Academic Regulation 4.9.
FLL 2103  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.

FLL 2203  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.

FLL 2443  (I) 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 ENGL 2443)

FLL 3103  (H) Hispanic Literature in Translation. Readings of significant works from Spanish and Spanish-American literatures in English translation. Does not apply to a minor or minor in Spanish.

FLL 3113  (H) French Literature in Translation. Readings of significant works from French literature in English translation. Does not apply to a major or minor in French.

FLL 3500  Specialized Study in a Modern Foreign Language. 1-20 credits, max 20, Lab 1-5. Prerequisite(s): Consent of instructor. Instruction and/or tutorial work in a modern foreign language other than those offered in a major program.

FLL 4000  Specialized Studies in Foreign Languages and Literatures. 1-9 credits, max 9, Lab 1-9. Prerequisite(s): Junior standing or consent of instructor. Individual guided study, tutorial or seminar on specially selected topics in a foreign language or literature.

FLL 4993  Senior Honors Thesis. Prerequisite(s): Departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a senior faculty member with second faculty reader, both of whom will be present at an oral defense of the thesis. Required for graduation with departmental honors in any foreign language major.

FLL 5210  Graduate Studies in Foreign Languages. 1-6 credits, max 20. Prerequisite(s): 15 upper-division hours in the language. Graduate studies in foreign languages.

Forensic Sciences (FRNS)

FRNS 5000* Research and Thesis. 1-6 credits, max 6, Lab 1-6. Prerequisite(s): Consent of major adviser. Research in forensic sciences for MS degree.

FRNS 5013* Survey of Forensic Sciences. Prerequisite(s): Consent of instructor. Predominantly online class providing overview of various forensic sciences and how they relate to presentation of evidence and to civil and criminal procedures involved in solving problems of law. Law and ethics, forensic pathology, forensic dentistry and anthropology, forensic toxicology and molecular biology (DNA), forensic nursing and death scene investigation, forensic psychology, criminalistics, questioned documents, forensic engineering and technology, forensic accounting, and management techniques in forensic sciences. A review of current guidelines for knowledge, procedures, quality assurance and control, and certification/certification from national standards boards and scientific and technical working groups.

FRNS 5023* Questioned Document Examination. Lab 2. Prerequisite(s): 5013 or concurrent enrollment. Functions of questioned document examiners, beyond document analysis to relating services and issues. History of questioned document handwriting, handwriting and handprinting, process for obtaining exemplars, types of document examination (e.g., typewriting, mechanical processes, indented writing, obliterated writing, inks, currency, erasures, physical matches, and post marks.) Collection and preservation of evidence as well as courtroom procedures. (This course does not train the student as a document examiner and in no way certifies or qualifies the student to conduct questioned document analysis at the conclusion of this course.

FRNS 5033* Theory and Practice of Forensic Handwriting Examination. Prerequisite(s): 5023. Theoretical and practical aspects of handwriting as forensic evidence. Production of normal and false handwriting, variables in handwriting production, standards of comparison, identification theories, examination methodologies, expression of conclusions, characterization and validation of examiner skills, legal admissibility of handwriting expertise, and challenges to professional practice.

FRNS 5043* Technical Aspects of Forensic Document Examination. Prerequisite(s): 5023. Basic theory in visual examination of questioned documents. Visual and color theory, measuring tools, instruments, simple microscopy, and photographic techniques. Technical description, theory, operation, and practical use of various instrumentation used in the field such as the Electrostatic Detection Apparatus (ESDA) and Video Spectral Comparator (VSC).

FRNS 5053* The Historical Aspects of Forensic Document Examination. Prerequisite(s): Graduate standing. This course presents historical aspects of forensic document examination. It covers development of handwriting, the acceptance of document examination expertise in Britain and North American, the early luminaries and famous cases.

FRNS 5063* Ethical Research and Scientific Writing. Prerequisite(s): Permission from research adviser. Develops knowledge and skills for ethical scientific research, writing and presentation. Covers responsible conduct, organization and design of research around a scientific question, and writing problems specific to science and the individual. Adviser guidance on some assignments required.

FRNS 5073* Quality Assurance in Forensic Science. Prerequisite(s): Admission to program. Preparation for the forensic scientist to develop and implement quality assurance and quality control procedures to ensure the excellence of a laboratory. Preparation of laboratory procedures and policies, use of appropriate standards and controls, and validation methods for establishing an effective quality assurance program in the laboratory.

FRNS 5083* Leadership in Forensic Leadership. Focus on leadership development for managers of forensic organizations, including examination of leadership and ethics theories, application to theories to problems in forensic settings, tasks and relational skills for developing effective teams and groups within an ethical framework.

FRNS 5090* Internship in Forensic Sciences. 1-3 credits, max 3. Prerequisite(s): 5073, initial course in chosen specialty, permission of adviser and program director, and letter of agreement or contract with designated facility or laboratory. Provides practical training and experience within a work or laboratory setting under the guidance of a designated supervisor. This experience should complement graduate studies in the forensic sciences and support related career goals. Note: requires four hours per week at internship site for each credit hour of enrollment; eight hours per credit for summer session.

FRNS 5113* Introduction to the Chemistry of Explosives, Pyrotechnics and Hazardous Material. Prerequisite(s): Permission from Instructor and Faculty Advisor. Provides basic familiarity of the chemistry of explosives, pyrotechnics, improvised explosives and hazardous materials.

FRNS 5123* Fire Dynamics Forensics in Forensic Investigations. Prerequisite(s): Permission from Instructor and Faculty Advisor. Teaches the fundamentals of how chemistry, fire science, fluid mechanics and heat transfer interact to influence fire behavior beyond document analysis to relating services and issues. History of questioned document examination, applications, effects, fragmentation analysis, IED component recognition and evidence collection, including DNA.

FRNS 5143* Methods in Fire and Explosion Investigation NFPA 921/1033. Prerequisite(s): Permission from Instructor and Faculty Advisor. Surveys investigative methods in fire and explosion including legal considerations, fire science, building construction, origin determination, interviewing, documenting, evidence collection, deaths and injuries and other emerging trends in scientific testing and research.

FRNS 5153* Explosives Research, Testing and Evaluation Methods. Prerequisite(s): Permission from Instructor and Faculty Advisor. Explores explosives characterization methods and explosives range testing methods to determine how to develop and document a test plan, test methods and instrumentation while documenting and writing results.

FRNS 5163* Advanced Fire Dynamics. Prerequisite(s): FRNS 5123 and permission of instructor and Faculty Advisor. Advanced fire dynamics will reinforce and expand upon the fundamentals of fire dynamics learned in the prerequisite class. This course will cover advanced concepts in Fire Dynamics, including ventilation effects and application of fire dynamics principles to real-world fire investigations.

FRNS 5173* Advanced Explosion Investigation. Prerequisite(s): Permission from Instructor and Faculty Advisor. Demonstrates a systematic method of investigating an explosion scene. Provides instruction in explosives identification, applications, effects, fragmentation analysis, IED component recognition and evidence collection, including DNA.

FRNS 5213* Molecular Biology for the Forensic Scientist. Prerequisite(s): Admission to the program. Develops a solid foundation of knowledge in molecular biology for understanding the concepts of genetic marker analysis, especially DNA typing.

FRNS 5223* Forensic Biology. Prerequisite(s): 5013 and 5213 or Instructor permission. Covers derivation of forensic evidence from biological sources for criminal and civil investigations. Includes progression of laboratory testing to identification human body fluid and its source, detection and characterization of stains or fluids and genetic marker testing.

FRNS 5242* Population Genetics for the Forensic Scientist. Prerequisite(s): 5513. Population genetics relevant to DNA analysis technologies to identify perpetrators of crime. Includes foundation of statistical knowledge in forensic DNA analysis and family relatedness testing, history and application of statistical and population genetic theories, assigning weight to matches in DNA profiles for the court.

FRNS 5282* Methods in Forensic Sciences. Lab 4. Prerequisite(s): Permission of instructor. Advanced-level laboratory course in which students apply knowledge from previous coursework and employ fundamental techniques and methods related to forensic biology, forensic microbiology, forensic pathology, and forensic toxicology.

FRNS 5313* Forensic Engineering and Technology. Lab 2. Prerequisite(s): 5013; college-level chemistry and biology; knowledge of physics, calculus, and spreadsheet calculations. Review of disciplines of chemistry, biology,
FRNS 5323* Forensic Accounting and Fraud Investigation. Prerequisite(s): 5013. Introduction of concepts and tools used in the fields of forensic accounting and financial fraud investigations. Issues of alter ego, constructive trusts, fraudulent conveyances, accounting liability, business valuations, lost profits, damages, marital dissolution issues and bankruptcy. Aspects of fraud investigation, including overview of fraud in U.S., types and methods of fraud perpetration, red flags of fraud perpetrators, money laundering, and international fraud investigations. (Upon completion student will have an understanding of accounting methods used in a litigation services/fraud investigation environment and knowledge of basic requirements for drafting expert reports in accordance with Federal Rules of Civil Procedure.)

FRNS 5913* Forensic Accounting and Fraud Investigation. Prerequisite(s): 5013. Introduction of concepts and tools used in the fields of forensic accounting and financial fraud investigations. Issues of alter ego, constructive trusts, fraudulent conveyances, accounting liability, business valuations, lost profits, damages, marital dissolution issues and bankruptcy. Aspects of fraud investigation, including overview of fraud in U.S., types and methods of fraud perpetration, red flags of fraud perpetrators, money laundering, and international fraud investigations. (Upon completion student will have an understanding of accounting methods used in a litigation services/fraud investigation environment and knowledge of basic requirements for drafting expert reports in accordance with Federal Rules of Civil Procedure.)

FRNS 5943* Forensic Management and Organizational Development. Prerequisite(s): 5013. Application of managerial and organizational leadership skills to the demands of forensic sciences, including attention to the human resource, relations and development issues. Inter-agency cooperation, quality control and assurance, certification and accreditation issues, and internal security.

FRNS 5960* Forensic Problem Solving through Applied Research. Prerequisite(s): Permission from instructor and faculty advisor. Examines mixed research methodologies and designs applicable to the forensic sciences. The course launches work on a creative project, including development of a purpose statement, research question and/or hypothesis as well as construction of an introduction and literature review.

FRNS 5970* Directed Readings in Forensic Sciences. 1-3 credits, max 3. Prerequisite(s): Permission of instructor and faculty adviser. Provides guided research under direction of the instructor. Capstone seminar course for all subspecialty tracks in forensic sciences. Not for native speakers per University Academic Regulation 4.9.

FRNS 5980* Non-Thesis Creative Component in Forensic Sciences. 1-3 credits, max 3. Prerequisite(s): Permission of instructor and faculty adviser; 5063 (concurrent enrollment allowed). Provides final-semester capstone experience for the non-thesis graduate student through independent research or project management. Culminates with presentation of results in writing and in a public forum, which may be via electronic delivery or in person.

FRNS 5990* Special Topics in Forensic Sciences. 1-3 credits, max 15. Prerequisite(s): Permission of instructor and faculty adviser. Provides for exploration on special topics in the forensic sciences. Students gain an understanding at an advanced level of the particular topic presented.

French (FREN)

FREN 1115 Elementary French I. Lab 1.5. Main elements of grammar and pronunciation, with work on the four basic skills of listening comprehension, speaking, reading and writing. Not for native speakers per University Academic Regulation 4.9.

FREN 1225 Elementary French II. Lab 1.5. Prerequisite(s): 1115 or equivalent. Continuation of 1115. Not for native speakers per University Academic Regulation 4.9.

FREN 2112 (I) Intermediate Reading and Conversation I. Lab 1. Prerequisite(s): 1225 or equivalent competence. (May have been gained in high school) Reading and discussion of simple French texts, mostly cultural. May be taken concurrently with other 2000-level French courses. Not for native speakers per University Academic Regulation 4.9.
GWST 2113 (S) Transnational Women's Studies. Introduction to research on women and gender in transnational contexts. Interpersonal relationships, socioeconomic status, power and authority as women experience them, myths and realities among women of different races, classes, ethnicities, sexual orientations, nationalities, ages, and physical ability. GWST 2123 (D,H) Introduction to Gender Studies. Introduction to critical thinking about the construction of gender and the intersections of gender with race, ethnicity, class, and sexuality. Basic methods of studying gender from an interdisciplinary humanities perspective.

GWST 2113 (D) Race and Representation in the U.S. Prerequisite(s): 2113 or 2123 recommended. An interdisciplinary examination of the inextricable relationship between race relations and reproductive politics. Issues explored include malthusianism, sterilization abuse, criminalizing pregnancy, natализm and nationalism, eugenics, the role of women of color in campaigns for reproductive justice, and representations of motherhood.

GWST 3713 (D) Gender and Representation. Cultural analysis of gender representation and gender relations. Using cultural texts and practices in several areas such as children’s culture, sport, music, film and TV.

GWST 4013* Approaches to Feminist Research. Prerequisite(s): 2113 or 2123 or consent of instructor. Examines the ethics and epistemologies of methodologies and theoretical frameworks most conducive to feminist analysis. This course prepares students to conceptualize their own research projects.

GWST 4113* Feminist Theories. Prerequisite(s): 2113 or 2123 or consent of instructor. Examines the different types of feminist theories and the role theory plays in the production of knowledge. A variety of feminist theories will be considered from an interdisciplinary perspective.

GWST 4503* Theorizing Men and Masculinities. Prerequisite(s): 4113 or permission of instructor. Examines the roles of men in various cultural contexts, the historical development of manhood as an ideal, and theories of masculinities.

GWST 4950* Special Topics in Global Feminism. 3 credits, max 6. Prerequisite(s): 2113 or 2123 or permission of instructor. Selected topics in the problems and issues of global women’s and feminist activism. Highlights the continuing fight to secure gender equality, especially in developing nations. Exploration of the women’s movement links with other human rights struggles across the globe.

GWST 4990* Directed Readings in Gender Studies. 1-3 credits, max 12. Prerequisite(s): Permission of instructor. Examines gender studies issues and topics.

GWST 5103* Gender and Sexuality. This course offers an interdisciplinary survey of major works and key concepts in the field of Gender and Women's Studies.

GWST 5300* Seminar in Gender and Women's Studies. This course will offer a topics-based graduate colloquium in the interdisciplinary and international field of Gender and Women's Studies. Potential topics include Gender and Modern War, Feminist Aesthetics, Sexuality and Space, Cold War Masculinities, and Gender and International Relations.

GWST 5990* Directed Readings in Gender and Women's Studies. 1-3 credits, max 6. Specialized readings or independent study in GWST.

General Engineering (GENG)

GENG 4010 Senior Design Project. 2-4 credits, max 4. Prerequisite(s): Senior standing in general engineering. Capstone design project through independent application of engineering principles and concepts from the disciplines covered in earlier coursework.

General Technology (GENT)

GENT 1153 Engineering Graphics. Lab 2. Sketching, manual drafting and CAD generation of engineering drawings to ANSI standards. Interpreting typical industrial drawings. Students with two years high school or one year practical ANSI drafting/CAD may substitute an advanced course in mechanical engineering technology with consent of their advisers.

GENT 2323 Statics. Prerequisite(s): MATH 2123 or 2144 and PHYS 1114 or 2014. Forces acting on bodies at rest; forces, moments of force, distributed forces, reactions, free-body diagrams, friction, internal forces and moments of inertia. Applications.

GENT 2650 Technical Projects. 1-4 credits, max 4. Prerequisite(s): 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.

GENT 3123 Applied Analysis for Technology. Prerequisite(s): MATH 2123 or equivalent. Applications of elements of matrix algebra, ordinary differential equations, and infinite series to problems in engineering technology.

GENT 3323 Strength of Materials. Prerequisite(s): MATH 2123 or GENT 2144 and Grade "C" or better in GENT 2323 or ENSC 2113. Stress and strain and their relation to loads. Axial, torsional and bending loads, beam deflection, curvatures and combined stresses. Applications emphasized.

GENT 3433 Basic Thermodynamics. Prerequisite(s): MATH 2123 or 2144 and PHYS 1114 or 2014. Basic scientific principles of energy and the behavior of substances as related to engines and systems. Gas laws, vapors and engine cycles.

Prerequisite(s): BIOC 3653 or MICR 3033

A regional general patterns and impact of processes significant to the spatial distribution of plants and animals and processes.

Lab 2. Distribution and analysis of locational aspects of urbanization; functions of transportation planning.

1-6 credits, max 6.

Explores natural hazards and their impact on society, how society deals with disasters, and how we can mitigate the effects of such events.

ECON 5083* Biogeography. Distribution of plants and animals and processes causing distribution. Human impact on biotic resources considered along with policy and management practices.

ECON 5083 Geoaecology and Environmental Human Impacts. Theoretical and methodological aspects of geoarchaeology, a discipline that aims at recovering field data for reconstructing environment-society relationships of the past. Key themes include climate change and human-induced land transformation as demonstrated through interdisciplinary research in different geomorphic contexts and cultural groups (hunter gatherers, agriculturalists, and urbanites) from around the world. Meets with 5063. No credit for students with credit in 5063.

ECON 5073 Climate Change: Past, Present, and Future. Aims at understanding and discussing the mechanisms of global climate change and how we have functioned in our past. In the recent decades and how scientists predict possible changes in the near and distant future. Meets with 5073. No credit for students with credit in 5073.

ECON 5083 Geography of Grass-Dominated Ecosystems. This course is an analysis of the nature and distribution of grass-dominated ecosystems (grasslands, savannas, and grassy tundra) around the world with emphasis on 1) co-evolutionary development with climate, herbivore, fire, and humans, 2) the grass-dominated ecosystems around the world, and 3) the challenges faced by these ecosystems in the context of modern global climate change and human development. Meets with GEOG 5093. No credit for students with credit in GEOG 5083.
GEOG 4103 (H) Historical Geography of the United States. Examination of the spatial dynamics of frontier encounter and settlement, regional development, and cultural landscape evolution in the United States from pre-European to modern times.

GEOG 4113* Cultural and Political Ecology. Focus on the relationship between culture and environment, people and place and how environments are politicized. Competing theories of human-environment interactions throughout history. The first half of the course focuses on theories of human agency, diffusion, migration, adaptation, decision-making and agricultural change. The second part of the course focuses on cultural landscapes, perception, and politicized environments to explain current environmental issues.

GEOG 4123* Geographical Aspects of Urban Planning. Prerequisite(s): GEOG 4113. Spatial aspects of urban planning: development of planning theory, various planning tools, and specific problem areas such as urban renewal and urban transportation.

GEOG 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.

GEOG 4153* Geography of Outdoor Recreation. Analysis of patterns of outdoor recreation with an emphasis on land-use planning in park and wilderness areas. Demand forecasting methods, the analysis of the socioeconomic and spatial impacts of recreation facilities provision and visitor management practices.

GEOG 4163 Resource Management in the National Parks. Contemporary resource management issues in U.S. National Park units. The role of human and natural processes in the management of water, air, biotic and cultural resources. No credit for students with credit in GEOG 5163.


GEOG 4213 (S) Sport, Place and Society. Spatial analysis of sport; its origin and diffusion, geographical organization and regional variation. Geographical movements and interaction associated with sport. Application of geographical solutions for reorganization and reform. Focus on both U.S. and international scene.

GEOG 4223 (H) Geography of Music. Geographical and historical analysis of music as a cultural trait. The cultural significance of music and how it varies from place to place as well as how it helps shape the character of a place.

GEOG 4233 Human Dimensions of Global Environmental Change. Discusses the current global environmental science research agenda called for by the international community, explores the arguments set forth regarding global environmental change, and looks at the current explanations and theories explaining the human dimensions of land-use/cover-change (lucc). Special emphasis on alternative, competing, and developing countries within the context of economic development and global environmental change. Meets with 5233. No credit for students with credit in 5233.

GEOG 4253 Geographic Perspectives on American Women’s Travel Accounts Then and Now. Examination of American women’s travel writing both past and contemporary to understand social practices involving both geography and gender associated with travel and tourism. Topics include: geographic imaginaries, identities, social norms and transgressions, constructing the “Other” and the tourist “gaze,” ideas of “home” and “away,” and mobilities of women, situating these ideas with place and “race.”

GEOG 4273 Land Use Science. Basic understanding of human land use history and changes. Evaluation of land use impacts on environment, climate, and public health. Introduction to land use monitoring and modeling using geospatial technologies. Meet with 5273. No credit for students with credit in 5273.

GEOG 4303* Applications of the Global Positioning System in Field Research. Prerequisite(s): GEOG 4203. Theory and applications of the Global Positioning System (GPS), focusing on accuracy issues in field data collection and integration with geographic information systems (GIS). Use of both recreation and mapping grade receivers.

GEOG 4313 Field Techniques and Geodata Collection. Prerequisite(s): Senior standing in GEOG or consent of instructor. Application of the concepts, methods, and field techniques for geographical analysis and research, including data acquisition, manipulation, analysis, and the presentation of results.

GEOG 4323* Computer Cartography. Prerequisite(s): GEOG 4203 or consent of instructor. Fundamentals of map compilation and design using computers. Thematic mapping of both socioeconomic and natural resource information. Discussion and application of various map input techniques involving digitizers, scanners, and global positioning system.

GEOG 4333 Remote Sensing. Intermediate course in remote sensing focusing on principles of remote sensing, digital imagery from aerial photography, multispectral, thermal and microwave remote sensing, image processing techniques, and field data collection. Discussions will include applications to agriculture, climate, fisheries, forestry, geography, landscape architecture, planning, and wildlife management. Hands-on exposure to current image processing software. Meets with 5333. No credit for students with credit in 5333.

GEOG 4343 Geographic Information Systems: Resource Management Applications. Prerequisite(s): GEOG 4203. Provides a theoretical and practical understanding of geographic information systems and its applications in natural resource management. Introduces industry popular GIS software for spatial and aspatial data analysis. Explores specific conditions, requirements, and processing considerations that allow geospatial data to be manipulated for problem solving. Meets with 5323. No degree credit for students with credit in 5323.

GEOG 4353* Geographic Information Systems: Socioeconomic Applications. Prerequisite(s): GEOG 4203. Theory and principles of geographic information systems (GIS) applied to socioeconomic problems, including location-allocation, market area determination, network analysis and analysis of demographic characteristics.

GEOG 4373* Spatial Analysis of Public Health. Prerequisite(s): 2343. Quantitative and qualitative analysis of public health issues from two geographic perspectives: human environment and spatial. Topics include medical geography, disease mapping, spatial data for public health, and basic applications of spatial statistics, geographic information system and remote sensing. Lectures are combined with case studies and lab illustrations throughout the course.

GEOG 4383* Introduction to GIS Programming. Prerequisite(s): GEOG 4203. Designed to provide students with an introduction to basic programming concepts and how such concepts are applied to geographic information systems (GIS) and other geographically oriented applications. The course will cover some basic concepts, discuss Python and Model Builder for ArcGIS, KML/KMZ for Google Earth/Maps, and introduce some basic concepts of mobile mapping development in Android.

GEOG 4510 Senior Project. 1-3 credits, max 3, Lab 1-3. Prerequisite(s): Senior standing and consent of instructor. Individually designed projects involving laboratory work, field work, library research or a combination of these.

GEOG 4600 (I) Geography Study Abroad. Participation in an international experience sponsored by the Department of Geography. Study Abroad courses typically involve the study of a country or region to provide an integrated understanding, through research and personal experience, of relevant cultural, historical, political, economic and environmental issues.

GEOG 4910 Topics in Geography. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Specialized physical, social and methodological topics in geography.

GEOG 4930 Readings in Geography. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Directed readings on selected topics, regions or methods in geography.

GEOG 4940 Undergraduate Cooperative Education Internship. 1-3 credits, max 3. Prerequisite(s): Consent of departmental internship committee coordinator and undergraduate committee. Practical experience in applying geographical concepts and tools to business or governmental problems. Emphasis on educational aspects of applying discipline-related tools to real-world problems. Credit not available for regular employment positions; must have fixed start/end dates.

GEOG 4943 Geospatial Information Science Internship/Research Capstone. Provides an opportunity to apply knowledge accumulated throughout previous geospatial coursework with a structured off-campus internship or on-campus research capstone. Practical, applied geospatial experience is gained by working with an internship supervisor at a public or private entity in consultation with an affiliated geography faculty member. Alternatively, research-oriented experience is gained through direct collaboration with an affiliated geography faculty member. For both options, student duties may include field-based data collection, data processing, computer programming, spatial analysis/modeling, map and graphics production, oral presentation, and/or writing.

GEOG 4993 Senior Honors Thesis. Prerequisite(s): Departmental invitation, senior standing, Honors Program participation. A guided reading and research project ending with an honors thesis under the direction of a faculty committee. Practical experience in applying geographical concepts and tools to business or governmental problems. Emphasis on educational aspects of applying discipline-related tools to real-world problems. Credit not available for regular employment positions; must have fixed start/end dates.

GEOG 5000* Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of adviser or major professor. Open only to students working on the master’s degree in geography.

GEOG 5001* Professional Development in Geography. Introduction and orientation to the graduate program in the Department of Geography.

GEOG 5023* Geography of Arid Lands. Analysis of the physical processes shaping the landscapes of deserts and areas around them, emphasizing the causes and effects of climatic change and human activities and including descriptions of desert land use and writing components.

GEOG 5063* Geoarchaeology and Environmental History. Theoretical and methodological aspects of geoarchaeology, a discipline that aims at recovering field data for reconstructing environment-society relationships of the past. Key themes include climate change and human-induced land transformation as demonstrated through interdisciplinary research in different geomorphic
Aims at understanding and discussing the mechanisms of global climate change and how they have functioned in our past, in the recent decades an how scientists predict possible changes in the near and distant future. Meets with GEOG 4073. No credit for students with credit in 4073.

GEOG 5073* Climate Change: Past, Present and Future. Aims at understanding and discussing the mechanisms of global climate change and how they have functioned in our past, in the recent decades an how scientists predict possible changes in the near and distant future. Meets with 4073. No credit for students with credit in 4073.

GEOG 5083* Geography of Grass-Dominated Ecosystems. This course is an analysis of the formation and distribution of grass-dominated ecosystems (grasslands, savannas, and grassy tundras) around the world with emphasis on 1) co-evolutionary development with climate, herbivore, fire, and humans, 2) the grass-dominated ecosystems around the world, and 3) the challenges faced by these ecosystems in the context of modern global climate change and human development. Meets with GEOG 4083. No credit for students with credit in GEOG 4083.

GEOG 5113* Landscape Ecology. Prerequisite(s): Graduate standing and BIOL 3034 or consent of instructor. Principles of landscape ecology, including structure and function of landscape elements such as patch, corridor, boundary, and matrix. Role of geographic processes, climate, biota, disturbance, and human influences in landscape structure and function. Interaction among landscape elements and role of landscape structure in ecosystem and landscape dynamics. Applications of landscape ecology to biodiversity conservation, wildlife management, and landscape planning. Survey of quantitative methods used in landscape ecology.

GEOG 5123* International Resource Management. Prerequisite(s): Graduate standing. Spatial perspectives on the assessment and management of natural resources. The role of resources in world trade, security and international environmental concerns.

GEOG 5140* Cultural and Historical Geography Seminar. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Development and critical analysis of research and theory in cultural and historical geography.

GEOG 5150* Geography of Sport, Recreation, and Leisure Seminar. 1-3 credits, max 9. Prerequisite(s): Graduate standing. This seminar is comprised of an advanced analysis of one or more topics in Sport Geography. The topics can include both cultural and economic issues in the spatial distribution of sport, or any other spatial aspect of the play, diffusion, or impact of sport. The seminar will also focus on student research activities. Specific topics related to sport geography.

GEOG 5163* Resource Management in the National Parks. Contemporary resource management issues in U.S. National Park units. Focus on the role of human and natural processes in the management of water, air, biotic and cultural resources.

GEOG 5183* Topics in Transportation Geography. Examination of a selected set of advanced topics in transportation geography, including network analysis, facility location problems, intelligent transportation systems and geographic information systems and logistics.

GEOG 5203* Writing Across the Discipline: Geographic Theses and Dissertations. Prerequisite(s): Permission of instructor. Addresses writing issues facing the discipline of geography, including identifying an audience, finding a voice, engaging with a theoretical framework, organizing data, understanding differences in presenting quantitative and qualitative evidence and effectively communicating both, pacing in an argument, crafting creative introductions and persuasive conclusions, and compiling an effective bibliography.

GEOG 5233* Human Dimensions of Global Environmental Change. Discussion of current scientific research agendas called for by the international community, explores the arguments set forth regarding global environmental change, and looks at the current explanations and theories explaining the processes of land-use/cover-change (LUCC). Special emphasis is on alternative, competing visions, and needs of developing countries within the context of economic development and global environmental change. Meets with 4233. No credit for students with credit in 4233.

GEOG 5243* Geography of the World's Indigenous Peoples. Prerequisite(s): Graduate standing and consent of instructor. A regional survey of indigenous peoples, cultural, political and economic self-determination outside the United States. Native land claims, impact of regional development and environmental issues upon indigenous communities, and their efforts to establish geopolitical autonomy.

GEOG 5273 Land Use Science. Basic understanding of human land use history and changes; evaluation of land use impacts on environment, climate, and public health. Introduction to land use monitoring and modeling using geospatial technologies. Meet with 4273. No credit for students with credit in 4273.

GEOG 5303* Geographical Analysis I. Prerequisite(s): One course in statistics. Application of models and statistics to geographic problem solving.

GEOG 5323* Geographic Information Systems: Resource Management Applications. Prerequisite(s): GEOG 4203 or instructor permission. Provides a theoretical and practical understanding of geographic information systems and its applications in natural resource management. Introduces industry popular GIS software for spatial and aspatial data analysis. Explores specific conditions and processes considerations that allow geospatial data to be manipulated for problem solving. Meets with 4343. No degree credit for students with credit in 4343.

GEOG 5333* Remote Sensing. Intermediate course in remote sensing focusing on principles of remote sensing, digital imagery from aerial photography, multispectral, thermal and microwave remote sensing, image processing techniques, and field data collection. Discusisons will include applications to agriculture, climate, fisheries, forestry, geography, landscape architecture, planning, and wildlife management. Hands-on exposure to current image processing software. Meets with 4333. No credit for students with credit in 4333.

GEOG 5343* Advanced Geographic Information Systems: Resource Management Applications. Lab 2. Prerequisite(s): 4343. Advanced theory and applications of geographic information systems (GIS) applied to resource management problems using both raster and vector data structures. Individual projects, presentations and group discussion sessions.

GEOG 5353* Advanced Geographic Information Systems: Socioeconomic Applications. Lab 2. Prerequisite(s): 4343. Advanced theory and applications of geographic information systems (GIS) applied to socioeconomic problems including location allocation, market area determination, network analysis, and analysis of demographic characteristics. Individual projects, presentations and group discussion sessions.

GEOG 5363* Enterprise Geographic Information Systems. Prerequisite(s): Consent of instructor. Development and creation of online geodatabases and Internet mapping services as would be used in a large scale GIS operation or enterprise. Geodatabase design and Internet map service website development.

GEOG 5383* Remote Sensing of Water Resources. Prerequisite(s): 2323 or 4343. Advanced theory and techniques for use of remote sensing and various issues in water resources management. Sensor characteristics, theoretical algorithms, digital image processing, and field methods to extract information of multiple aspects valuable for both hydrological modeling and decision-making. Advantages and limitations of remote sensing compared to traditional methods will be explored.

GEOG 5403* Current Geographic Research. Prerequisite(s): Graduate standing in geography. Review of recent literature in light of current human and physical geography research trends.

GEOG 5413* History and Philosophy of Geography. Prerequisite(s): Graduate standing in geography. Identification and evaluation of major themes in geographical research and teaching.

GEOG 5423* Geographic Renderings in Qualitative Methods. Prerequisite(s): SCFD 5913 or SCFD 6123 or SOC 5273 or consent of instructor. Seminar engages with geographic facets in qualitative research and provides students with experience in collecting and working with qualitative data. Students explore avenues of qualitative inquiry in cross-cultural, community participation, and storytelling/testimonial/oral history/life history, and ethnographic research with special consideration to space, place, scale, context, body, and senses. Course addresses issues involved with analysis, interpretation, and “writing-up” research.

GEOG 5450* Seminar in Geography. 1-6 credits, max 6. Prerequisite(s): Graduate standing in geography or consent of instructor. Specialized topics in geography.

GEOG 5510* Research Problems in Geography. 1-3 credits, max 6. Prerequisite(s): Consent of instructor.

GEOG 5700* Geography Study Abroad. 1-3 credits. Participation in an international experience sponsored by the Department of Geography. Study Abroad courses typically involve the study of a country or region to provide an integrated understanding, through research and personal experience, of relevant cultural, historical, political, economic, and environmental issues.

GEOG 5930* Readings in Geography. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Directed readings on selected topics, regions or methods in geography.

GEOG 5940* Graduate Cooperative Education Internship. 1-3 credits, max 3. Prerequisite(s): Consent of departmental internship coordinator and graduate committee. Practical experience in applying geographical concepts and tools to business or governmental problems. Emphasis on educational aspects of applying discipline-related tools to real-world problems. Credit not available for regular employment positions; must have fixed start/end dates.

GEOG 6000* Doctoral Dissertation Research. 1-12 credits, max 30. Prerequisite(s): Admission to candidacy and consent of major professor.

GEOG 6013* Seminar in Quaternary Paleoecology. Prerequisite(s): Graduate standing in geography or consent of instructor. Analysis and discussion of various aspects of research on the Quaternary period, emphasizing the roles played by climate, geomorphic processes, vegetation, soil and fauna.

GEOG 6110* Seminar in Cultural and Political Ecology. 3 credits, max 6. Prerequisite(s): Graduate standing and consent of instructor. Consent of instructor. Study of the relationship between culture and environment and competing theories of human-environment interactions. Traces the roots of cultural ecology starting with classic ecological systems and adaptation theory, to criticisms leading to the development of “hybrid” ecological theories. Course focuses on Marxist influences, inequalities of third world development, gender and resource management, social and environmental movements, indigenous knowledge.
natural disasters and environmental vulnerability.

**GEOL 6120** Seminar in Urban Geography. 3 credits, max 6. Prerequisite(s): Graduate standing in geography or consent of instructor. Analysis of research on urban systems, internal morphology, urban problems and urban spatial behavior. Review and analysis of student research efforts.

**GEOL 6130** Seminar in Political Geography. 3 credits, max 6. Prerequisite(s): Graduate standing in geography or consent of instructor. Theoretical foundations of political geography from MacKinder and Hartshorne to recent writings by Smith, Anderson and other modern theorists. Nationalism, national identity, state formation and cohesion considered in a spatial context.

**GEOL 6180** Seminar in Transportation Geography. 3 credits, max 6. Prerequisite(s): Graduate standing. Examination of transportation systems, emphasizing their effects on trade, land use, location issues, and development. Review of trends, problems, and methods related to transport issues.

**GEOL 6210** Seminar in Historical Geography. 3 credits, max 6. Prerequisite(s): Graduate standing. Current epistemological issues and archival methodologies in historical geography.

**GEOL 6303** Geographic Analysis II. Prerequisite(s): 5303. Advanced methods of spatial analysis, including spatial autocorrelation, geographically weighted regression and related spatial analysis methods.

**GEOL 6313** Mixed Methods in Field Research. Prerequisite(s): Graduate standing in geography or consent of instructor. This course will expose students to a variety of qualitative and quantitative techniques useful in successfully designing and completing field research. Special focus will include the research and survey design, interviewing, ethnography, and visual techniques such as the use of imagery, photography, sketch mapping, and Global Positioning Systems (GPS) for the collection and analysis of geospatial data. Required field trips.

**GEOL 6333** Advanced Remote Sensing. Prerequisite(s): GEOL 4333 or GEOL 5333. Provides in-depth theoretical preparation of advanced remote sensing and image analysis techniques. Special topics include advanced classifications, hyperspectral imagery, and LiDAR. Specific issues surrounding data capture, image processing, and analysis will be discussed to prepare students for semester-long research projects.

**GEOL 6910** Topics in Geography. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Specialized physical, social and methodological topics in geography.

**GEOL 6930** Readings in Geography. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Directed readings on selected topics, regions or methods in geography.

### Geology (GEOL)


**GEOL 1114** (L,N) Physical Geology. Prerequisite(s): MATH 1513 or higher with a grade of "C" or higher; or an acceptable math placement score (see http://placement.okstate.edu) 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. Recommended introductory course for science majors. Field trip required.

**GEOL 1224 Evolution of the Earth.** Prerequisite(s): GEOL 1014 or 1114 with a minimum grade of "C". A survey of the physical and biological history of the Earth from the coalescence of the solar system to the present. Field trips required.

**GEOL 2254** Practical Mineralogy. Prerequisite(s): 1014 or 1114 and CHEM 1314 or 1414 completed with a grade of "C" or higher. Hand-specimen identification of minerals using physical and chemical properties. Introductory optical identification of common rock forming minerals. Society's utilization of mineral resources. Field trips required.

**GEOL 2364** Igneous and Metamorphic Petrology. Prerequisite(s): 2254 completed with a grade of "C" or higher. Origin, occurrence and classification of igneous and metamorphic rocks; hand-specimen and thin section identification. Field trip required.

**GEOL 3004** Earth Science for Teachers. Prerequisite(s): 1114 or equivalent. Teaching natural earth systems and their environmental impact. Use of an adaptive, inquiry-driven approach for organizing, presenting, and evaluating earth science concepts in the curriculum. Field trips required.

**GEOL 3014** Structural Geology. Prerequisite(s): GEOL 1114 and PHYBS 2014 each with a grade of "C" or higher. Behavior of earth materials during various deformational processes and analysis of the resulting structural features such as folds, faults and fractures.

**GEOL 3034** Principles of Stratigraphy and Sedimentology. Lab 3. Prerequisite(s): 2244 and 2254 each with a grade of "C" or higher. Principles of stratigraphy and their applications. Survey of sedimentary rock types, principles of description and classification, origin of sedimentary deposits, analysis of stratigraphic sequences. Topics include depositional systems; litho- and biostratigraphy; geochronology and chronostratigraphy; magnetic, seismic, and sequence stratigraphy; tectonic vs. climatic controls. Field work required.

**GEOL 3043** (N) Geology of the National Parks. Prerequisite(s): 1014 or equivalent recommended. The geologic characteristics of national parks and scenic regions in North America and throughout the world. Intended for non-majors.

**GEOL 3073** Geomorphology. Lab 2. Prerequisite(s): 1114 and MATH 2144 or concurrent enrollment. 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.

**GEOL 3103** Paleontology. Lab 3. Prerequisite(s): 1224 or consent of instructor. Basic principles of paleontology involving invertebrates, vertebrates and plants. Lab focus is on the morphology, identification, paleoecology and biostratigraphy of marine invertebrates. Field trips required.

**GEOL 3413** Petroleum Geology for Engineers. Lab 2. Prerequisite(s): MATH 2114 and CHEM 1414 or 1314 and PHYS 2114 or 2014. Examination of the fundamental concepts of petroleum geology with an emphasis on applications to drilling and reservoir engineering. Topics include reservoir architecture, traps and seals, the subsurface environment, wireline logs, geophysics and depositional systems. Field trip required. No degree credit for geology majors.

**GEOL 3503** Environmental Geology. Prerequisite(s): 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.

**GEOL 3546** Field Geology. Lab 12. Prerequisite(s): 2364 and 3034 and 3073. Six weeks of field methods in geology. Required of all geology majors. Transportation and room fees required.

**GEOL 4023** Petroleum Geology. Prerequisite(s): 3014 and 3034. Origin, migration and accumulation of petroleum, requirements for source rock, reservoir rock and traps. Structure and stratigraphy of selected oil fields. Field trips required.

**GEOL 4030** Geologic Field Investigation. 1-3 credits, max 3. Prerequisite: 1014 or 1114. One to three weeks of required field study at sites of geological interest and significance. Field trip charges apply. Does not substitute for GEOL 3546. No credit for students who have credit in 5030.

**GEOL 4103** Introduction to Geophysical Exploration. Lab 2. Prerequisite(s): PHYS 2114 and MATH 2153 each with a grade of "C" or higher. An overview of geological and geophysical methods and their applications to environmental and engineering problems. Seismic reflection and refraction methods, gravity, magnetic, resistivity and electromagnetic methods. A field trip required.

**GEOL 4113** Seismic Interpretation. Prerequisite(s): GEOL 4031, 3014, and 3034 each with grade of "C" or higher. Examination of the reflection seismic interpretation methods with emphasis on the oil and gas industry. Both structural and stratigraphic methods. Hands-on interpretation using a standard industry software package. Same course as GEOL 5213.

**GEOL 4213** Plate Tectonics. Prerequisite(s): 3014 with a grade of "C" or higher. Evolution of the earth's surface; tectonic development; plate tectonics. Examination of structural associations in relation to tectonic plate boundaries. Mechanisms for plate tectonics and implication for resources and the environment.

**GEOL 4300** Geology Colloquium. 1 credit, max 2. Prerequisite(s): 15 credit hours in geology and junior status. Discussion of selected topics in the geological sciences with emphasis on professional presentation practices.

**GEOL 4303** Geophysical Field Methods. Lab 2. Prerequisite(s): 4103. Hands-on field investigations using the different geophysical surveying methods including electrical resistivity/induced polarization, self potential, electromagnetic, ground penetrating radar, gravity, magnetic, and seismic reflection and refraction. Instrumentation, field data acquisition, and interpretation will be emphasized. Several field trips and field projects required.

**GEOL 4313** Introduction to Well Log Analysis. Lab 2. Prerequisite(s): 3034 with a grade of C or better. Introduction for undergraduate Geology majors to basic properties of wireline well logs, including identification of lithology, influence of borehole fluids, porosity and permeability on wireline signatures. Examination of structural associations in relation to tectonic plate boundaries. Mechanisms for plate tectonics and implication for resources and the environment.

**GEOL 4323 Advanced Well Log Analysis for Engineers.** Prerequisite(s): 3413 with a grade of "C" or higher. This is a core course for the Minor in Petroleum Engineering. Course material builds on information to prerequisite course Geology 4313. This course covers geologic interpretation of reservoir characteristics based on a variety of well logs; quantitative determination of porosity and permeability, reservoir fluid flow and how they influence well log properties, calculation of water saturation, introduction to unconventional reservoirs, drilling and logging in lateral holes.

**GEOL 4403** Geochemistry. Prerequisite(s): GEOL 1014 or GEOL 1114 or consent of instructor; CHEM 1314 and CHEM 1515 or concurrent enrollment; MATH 1513 or above. Application of chemical principles to geological processes. Modeling water-rock interaction and understanding water quality. No degree
credit for students with credit in GEOL 5403.

**GEOL 4453 Hydrogeology.** Prerequisite(s): Minimum grade of "C" or better in PHYS 1114 or PHYS 2114. The water cycle and ground-water systems as well as general problems related to ground-water occurrence, quantity, quality and pollution. Field trip required.

**GEOL 4463** Physical Hydrogeology. Lab 2. Prerequisite(s): 4453 or similar; PHYS 2114. Physical ground-water systems. Realistic problems to acquaint students with ground-water occurrence and movement. Geologic, geophysical, hydraulic testing and modeling techniques used to define an actual ground-water system. Ground-water regulations. Field trips required.

**GEOL 4513 Marine Geology.** Prerequisite(s): CHEM 1314 or equivalent; PHYS 1114 or 2014 or equivalent; GEOL 3034 or equivalent. All with a grade of "C" or higher. Comprehension and examination of the geology of the ocean basins. Topics include: techniques of data collection and interpretation; shoreline, shelf and deep ocean processes; physical oceanography; origin and distribution of marine sediments; paleoceanography; marine mineral resources; marine tectonics and ocean history. Same course as GEOG 5513.

**GEOL 4543 Introduction to Exploration Seismology.** Prerequisite(s): 4103 and 4403. Introduction to theory, techniques, and application of seismic to field of hydrocarbon, groundwater, and minerals exploration. Review of fundamentals of wave propagation, historical development of the science, and current literature on applied, including radiocarbon and special luminescence dating. Topics in 5424.

**GEOL 4573 Marine Biogeochemical Cycles.** Prerequisite(s): 1224 and 4403 and CHEM 1314. Analysis of the interactions between geological processes, biological activity, and chemical cycling for a range of elements. Limited discussion of atmospheric, terrestrial, and freshwater systems as they impact the oceans will also be discussed. Includes discussions of changes in elemental cycles through Earth's history and comparison to present-day patterns. No credit for credit in 5573.

**GEOL 4753 Volcanology.** Prerequisite(s): 2364 completed with a grade of "C" or higher. Examination of volcanic processes, products, and structures on Earth and other terrestrial bodies. Optional field trip. No credit for students with credit in 5753.

**GEOL 4773 Planetary Geology.** Prerequisite(s): GEOL 1114 (required) and GEOL 3073 (recommended). Geology of planets and planetary bodies, including geomorphology, tectonics, geochemistry, and geophysics; perspectives on exploration; and life in a planetary environment.

**GEOL 4981 Geoscience Internship.** Prerequisite(s): Consent of instructor. Student participation in a research project during an internship in a geoscience-related professional work setting. Graded on a pass/fail basis.

**GEOL 4990 Special Problems in Earth Science.** 1-8 credits, max 3. Prerequisite(s): 2364 completed with a grade of "C" or higher. Examination of volcanic processes, products, and structures on Earth and other terrestrial bodies. Field trips required. No credit for students with credit in 5753.

**GEOL 4993 Senior Honors Thesis.** Prerequisite(s): 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 secondary supervision by reader and director. Required for graduation with departmental honors in geology.

**GEOL 5000 Master's Thesis.** 1-6 credits, max 6. Prerequisite(s): Approval of graduate committee. Work toward master's thesis in geology.

**GEOL 5030 Geologic Field Investigation.** 1-3 credits, max 3. One to three weeks of required field study at sites of geological interest and significance. Emphasis will be placed on applicability to graduate research. Field trip charges apply. No credit for students who have credit in 4030.

**GEOL 5039 Quaternary Geology and Geochronology.** Prerequisite(s): GEOL 3034; MATH 1715 or equivalent; PHYS 2014 and 2114 or equivalent. All with a grade of "C" or higher. Examination of the causes and effects of climate change during the ice ages. Survey of dating methods applicable to the Quaternary, including radiocarbon and special luminescence dating. Application of chemical principles to geological processes. Modelling water-rock interaction and understanding water quality. No degree credit for students with credit in GEOL 4403.

**GEOL 5433 Isotope Geochemistry.** Lab 2. Introduction to the basic principles of stable isotope geochemistry. Study of the production, distribution, and use of naturally occurring and anthropogenically introduced stable isotopes in the earth's near surface environment with applications to hydrology, biogeochemistry, global change and petroleum systems.

**GEOL 5453 Groundwater Modeling.** Prerequisite(s): 4453 or equivalent, MATH 2144, MATH 2153 each with a grade of "C" or higher. Modeling ground water systems. Realistic problems to acquaint students with the movement of groundwater fluids. Development of models of fluid movement through the subsurface using geological and geophysical data. Field trips required.

**GEOL 5463 Physical Hydrogeology.** Prerequisite(s): 4453 or similar with a grade of C or better; PHYS 2114 with a grade of C or better. Physical groundwater systems. Realistic problems to acquaint students with the movement of groundwater fluids. Development of models of fluid movement through the subsurface using geological and geophysical data. Field trips required.

**GEOL 5483 Integrated Petroleum Water Resources Management.** Prerequisite(s): GEOL 4453 or equivalent, MATH 2144 and 2153 each with a grade of "C" or higher. Developing, maintaining, and disposing of seawater for use in the petroleum industry. Problems associated with water production and disposal including water quality issues and seismicity. Field trips required.

**GEOL 5513 Marine Geology.** Prerequisite(s): CHEM 1314 or equivalent; PHYS 1114 or 2014 or equivalent; GEOL 3034 or equivalent; all with a grade of...
"C" or higher. Comprehensive examination of the geology of the ocean basins. Topics include techniques of data collection and interpretation; shoreline, shelf and deep ocean processes; physical oceanography; origin and distribution of marine sediments; paleoceanography; marine mineral resources; marine tectonics and ocean history. Same course as GEOL 4513.

GEOL 5533* Environmental Geochemistry. Prerequisite(s): CHEM 1314 or 1515 or equivalent; GEOL 3034 or equivalent; GEOL 4403 or equivalent or permission of instructor. Introduction to some environmental aspects of organic geochemistry. Soils and sediments as pollutant receptors, soil evolution, pollutants, aspect of environmental health.

GEOL 5533* Organic Geochemistry. Prerequisite(s): CHEM 1314 and 1515 or equivalent; GEOL 3034 or equivalent; or permission of instructor. Chemistry of organic matter in sediments and rocks with an emphasis on marine and petroleum systems.

GEOL 5543* Introduction to Exploration Seismology. Prerequisite(s): GEOL 4003 and 4303. Introduction to theory, techniques, and application of seismic to field of hydrocarbon, groundwater, and minerals exploration. Review of fundamentals of wave propagation, historical development of the science, and current literature on application and instrumentation. No credit for students with credit in 4543.

GEOL 5573* Marine Biogeochemical Cycles. Prerequisite(s): 1224 and 4403 and CHEM 1314. Analysis of the interactions between geological processes, biological activity, and chemical cycling for a range of elements. Limited discussion of atmospheric, terrestrial, and freshwater systems as they impact the oceans will also be discussed. Includes discussions of changes in elemental cycles through Earth's history and comparison to present-day patterns. No credit for credit in 4573.

GEOL 5603* Basin Evolution. Prerequisite(s): 3014, 3034, 4403. Advanced topics in sedimentary basin studies, including tectonics, sequence stratigraphy, facies analysis, regional diagenesis, thermal evolution, regional hydrogeology, and distribution of natural resources.

GEOL 5633* Exploration Prospect Evaluation. Lab 6. Prerequisite(s): Graduate standing and permission of the instructor. Evaluation of exploration prospects in front of the undeveloped petroleum provinces using borehole-derived and geophysical data. Team taught course that uses industry provided datasets and current data management and interpretation software to research or drill or no-dril decisions based on science, risk analysis and economics.

GEOL 5753* Volcanology. Prerequisite(s): 2364 or equivalent with a grade of "C" or higher. Examination of volcanic processes, products, and structures on Earth and other terrestrial bodies. Optional field trip. No credit for credit in 4753.

GEOL 5773* Planetary Geology. Lab 2. Prerequisite(s): GEOL 1114, and GEOL 3073 recommended. Geology of planets and planetary bodies, including geomorphology, tectonics, geochemistry and geophysics; perspectives on exploration; and life in the universe.

GEOL 5981* Geoscience Internship. Prerequisite(s): Consent of instructor. Student participation in a research project during an internship in a Geoscience-related professional work setting for graduate credit. Graded on a pass-fail basis.

GEOL 5990* Advanced Studies in Geology. 1-4 credits, max 8. Prerequisite(s): Consent of instructor. Individual library, laboratory and/or field projects on facets of geology not covered by existing courses. Field trips may be required.

GEOL 6000* Doctoral Dissertation Research. 1-12 credits, max 60. Work toward doctoral dissertation in Geology.

GEOL 6103* Gravity and Magnetic Methods. Lab 2. Prerequisite(s): 4103. Principles of gravity and magnetic methods applied to petroleum, mineral, and groundwater exploration. Engineering applications will also be discussed. Data acquisition, processing and modeling using standard industry software will be emphasized.

GEOL 6133* Unconventional Petroleum Reservoirs. Prerequisite(s): 4023. Review of unconventional sources of oil and gas production including coalbed methane, tight gas sandstones, gas and oil-bearing shales and transition zone, high-water saturation sandstones and carbonates.

GEOL 6283* Geology of Shales. Lab 2. Prerequisite(s): Graduate standing or permission of instructor. Comprehensive study that combines different geological techniques towards gaining a better understanding of shales as source and reservoir rock. These include petrography, XRD, SEM, Organic and Inorganic chemistry, geochemical logs, paleoecology and biostratigraphy. This course will involve lecture as well as laboratory techniques.

GEOL 6303* Electromagnetic and Electro magnetic Methods. Lab 2. Prerequisite(s): 4103. Principles of the different geoelectrical methods, including electrical resistivity, induced polarization, self potential, electromagnetism, ground penetrating radar will be emphasized. Geophysical instrumentation, laboratory and measurements of physical properties, field procedures, and basic interpretation and near surface geophysical applications will be discussed. Recent advances in geoelectrical methods and case studies will be examined by reviewing current literature. Field trip required.

GEOL 6363* Carbonate Reservoir Characterization. Prerequisite(s): GEOL 5363 with a grade of "B" or higher. Integrated study and application of modern and ancient depositional systems, diagenesis, petrophysics, sequence stratigraphy, and geostatistical modeling towards the understanding of the three dimensional distribution and reservoir characterization of carbonate and mixed carbonate/siliciclastic systems. This is a seminar and project-based course. Field trip required.

GEOL 6373* Advanced Carbonate Petrology and Geochemistry. Prerequisite(s): GEOL 4403 with a grade of "C" or higher and 5363 with a grade of "B" or higher or equivalent or consent of instructor. This course will cover advanced topics in carbonate petrology and geochemistry with emphasis on both early and late diagenetic processes, dolomitization, porosity and permeability, geochemical evolution of seawater and carbonate sediments, and regional diagenetic patterns in carbonate rocks and related strata.

GEOL 6386* Sequence Stratigraphy of Shales. Lab 12. Prerequisite(s): Graduate standing. Intensive field course focusing on hydrocarbon-bearing shales of the Midcontinent. Advanced field techniques including high resolution spectral gamma ray analysis and highly detailed measured sections will be taught. Fifty localities including Devonian-Early Mississippian (Woodford and Chattanooga shales), Upper Mississippian ( Barnett, Caney, and Fayetteville shales) and Pennsylvanian-Lower Permian shales will be analyzed.

GEOL 6403* Biogeophysics. Lab 2. Prerequisite(s): 5443 or 4103 or 6303. Introduces students to the important role that microbes play in geologic processes and explores current cutting-edge research available to investigate these processes. Interactions of microorganisms with earth materials (soils, rocks, water, etc.) and geophysical methods used to investigate microbial processes will be emphasized.

GEOL 6503* Rock Fractures. Prerequisite(s): 3014. Mechanical analysis and tectonic implications of brittle structural features such as joints, veins, and faults. Examination of topics such as mechanical stratigraphy in layered rocks, factors controlling joint spacing, and the dependence of failure mode on lithology. Field trips may be required.

GEOL 6553* Contaminant Transport. Lab 4. Prerequisite(s): CHEM 1314 and CHEM 1315 or consent of instructor. Origin and evolution of natural water quality, with emphasis on anthropogenic and natural contaminants. Distribution and mobility of elements in the secondary environment. Computational methods for the interpretation of water analyses.

German (GRMN)

GRMN 1115 Elementary German I. Main elements of grammar and pronunciation, with work on the four basic skills of listening comprehension, speaking, reading and writing. Not for native speakers per University Academic Regulation 4.9.

GRMN 1225 Elementary German II. Prerequisite(s): 1115 or equivalent. Continuation of 1115. Not for native speakers per University Academic Regulation 4.9.

GRMN 2112 (I) Intermediate Conversation and Composition I. Prerequisite(s): 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. Not for native speakers per University Academic Regulation 4.9.

GRMN 2113 Intermediate German. Prerequisite(s): GRMN 1225 or equivalent. Selections from German literature and temporary cultural reading material. May be taken concurrently with other 2000-level German courses. Not for native speakers per University Academic Regulation 4.9.

GRMN 2222 (I) Intermediate Conversation and Composition II. Prerequisite(s): 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. Not for native speakers per University Academic Regulation 4.9.

GRMN 2223 Introduction to German Literature and Film. Prerequisite(s): GRMN1225 or equivalent competence. (May have been gained in high school.) Reading/viewing and analysis of prose, drama and poetry, and film for building literary and cultural appreciation. May be taken concurrently with other 2000-level German courses. Not for native speakers per University Academic Regulation 4.9.

GRMN 3013 German for Reading Requirements I. Reading in the humanities and the sciences. Translation from German to English.

GRMN 3023 German for Reading Requirements II. Prerequisite(s): 3013 or equivalent. Intermediate and advanced reading in the humanities and sciences. Translation from German to English.

GRMN 3343 German for Professional Purposes. Prerequisite(s): 20 hours of German or equivalent proficiency. Introduction to business concepts, practices and the expectations of professional life in Germany. Focus on specialized vocabulary.

GRMN 3463 Advanced Diction and Phonetics. Prerequisite(s): 20 credit hours of German or equivalent. German sound systems and intonation patterns. Practice to improve the student's pronunciation. Required course for teacher certification.

GRMN 3803 Advanced Conversation. Prerequisite(s): 20 hours of German or equivalent proficiency. Colloquial speech forms and sentence structure. Practice in brief public address in German.
GRMN 3113 Elementary Classical Greek I. Grammar and vocabulary of ancient Greek. 1-6 credits, max 6. Prerequisite(s): 20 hours of German or equivalent proficiency. Historical, cultural, political and literary trends in the formation of German civilization. Capstone course.

GRMN 3123 19th Century German Literature. Prerequisite(s): 20 hours of German or equivalent proficiency. The major cultural, social and political forces that have shaped the Germany of today.

GRMN 3453 Contemporary German Literature. Prerequisite(s): 20 hours of German or equivalent proficiency. Main currents in German literature from Naturalism until present day.

GRMN 4513 The Age of Goethe. Prerequisite(s): 20 hours of German or equivalent proficiency. Principal figures of German Classicism and Romanticism.

GRMN 4523 19th Century German Literature. Prerequisite(s): 20 hours of German or equivalent proficiency. Prose, lyric and drama from Romanticism to Naturalism.

GRMN 4533 Backgrounds of Modern German Civilization. Prerequisite(s): 20 hours of German or equivalent proficiency. Historical, cultural, political and literary trends in the formation of German civilization.

GRMN 4550 Studies in German. 1-3 credits, max 9. Prerequisite(s): 20 credit hours of German or equivalent competence. Reading and discussion of vital subjects in German.

Health (HLTH)

HLTH 2213 Principles in Health Education and Health Promotion. Introduction to the field of health education and health promotion focusing on health principles, theories, career opportunities and a field experience. Previously offered as HHP 2213.

HLTH 2323 Drugs and Society. Impact of recreational use of drugs on society. Topics will include stimulant, depressant, and hallucinogenic recreational drugs, ergogenic substances and current research regarding addiction. Particular focus will be given to current trends of substance use and abuse. Cannot be substituted for HLTH 3913. Previously offered as HHP 2323.

HLTH 2603 (S) Total Wellness. Overview of individual, interpersonal, and sociocultural issues that have an impact on health. Behavioral decision-making, social relations, cultural diversity and environmental sensitivity. Previously offered as HHP 2603.

HLTH 3113 (D) Health Issues in Diverse Populations. The purpose of the course is to introduce concepts of health disparities, and equity for diverse populations across a range of health topics. The course will also introduce the students to community based solutions to health issues for diverse populations in an effort to promote inclusivity.

HLTH 3511 Peer Health Education I. Prerequisite(s): Approval of instructor. Comprehensive analysis and application of the theory and practice of peer education principles, designed to educate and provide experiences in preparation for planning and/or participation in integral university or community peer education programs.

HLTH 3512 Peer Health Education II. Prerequisite(s): Successful completion of HHP 3511 and approval of instructor. Comprehensive analysis and application of the theory and practice of peer education principles, designed to education and provide experiences in preparation for planning and/or participation in integral university or community peer education programs.

HLTH 3603 Understanding HIV. Examines the HIV global epidemic from historical, political, epidemiological, medial, psychological, legal, and ethical perspectives. Previously offered as HHP 3603.

HLTH 3613 Community Health. Prerequisite(s): HLTH 2213. HLTH 2603, or consent of instructor. A survey of issues impacting the health of populations from a community health perspective. Previously offered as HHP 3613.

HLTH 3623 School Health Programs. Prerequisite(s): HLTH 2603. The identity and relationships of school health instruction, services and environments. Previously offered as HHP 3623.

HLTH 3643 Health Behavior Theory. Prerequisite(s): Full admission to HEP and junior standing or consent of instructor. Survey of biopsychosocial behavioral models to determine basis for health risk behaviors, with emphasis on determinants of health/risk behavior and exploring health behavior theories across age, sex, ethnicity, culture and socio-economic status. Same course as HHP 3643, HHP 4503. Previously offered as HHP 3643.

HLTH 3723 Principles of Epidemiology. Prerequisite(s): Full admission to HEP and junior standing or consent of instructor. Survey of epidemiological principles as they relate to the planning of both community and consumer-focused health promotion and disease prevention programs. Same course as HHP 4633. Previously offered as HHP 3723.

HLTH 3913 Alcohol and Drug Education. Introduction to the field of health education and health promotion focusing on health principles, theories, career opportunities, and a field experience. Same course as HHP 4033. Previously offered as HHP 3913.

HLTH 4233 Health and Sexuality. Prerequisite(s): Full admission to HEP
and junior standing or consent of instructor. The study of human sexuality as it relates to the health and well-being of individuals in the community, college, school or worksite settings. Previously offered as HRP 4233.

HLTH 4533 Psychosocial Issues in Health Education/Promotion. Prerequisite(s): Full admission to HEP and senior standing or consent of instructor. Psychosocial issues as they relate to the practice of health education/promotion. Personal and professional applications of the course material will be emphasized. Previously offered as HHP 4533.

HLTH 4770 Internship in Health Education and Promotion - Exercise and Health (Athletic Training). Prerequisite(s): Last semester; and Senior standing with cumulative GPA 2.75; current CPR and First Aid Certification. Supervised field work experience in health promotion or health-related settings for students going in to the Master of Athletic Training 3/2 Program.

HLTH 4783* Health Issues in Gerontology. Prerequisite(s): HLTH 2603. An in-depth study of physiological aspects, special health concerns, chronic illnesses and services as applied to gerontology. Previously offered as HHP 4783.

HLTH 4880* Internship in Health Education and Promotion - Community Health. Prerequisite(s): Last semester; Senior standing with cumulative GPA 2.75. Supervised field work experience in health promotion or health-related settings for students in the Community Health option. Previously offered as HHP 4880.

HLTH 4902 Pre-Internship Seminar. Prerequisite(s): Full admission to HEP, last semester prior to 4990 or consent of instructor. Capstone course for the health promotion program. Preparation for the health internship experience. Full admission to HEP, last semester prior to 4990 or consent of instructor. Capstone course for the health promotion program. Preparation for the health internship experience. Previously offered as HHP 4902.

HLTH 4973 Program Design in HEP. Prerequisite(s): Full admission to HEP and senior standing or consent of instructor. A survey of program design principles, including theoretical foundations, planning, marketing, delivering and evaluating. Same course as HHP 4433. Previously offered as HHP 4973.

HLTH 4990* Internship in Health Education and Promotion - Exercise and Health. 1-12 credits, max 12. Prerequisite(s): Last semester; Senior standing with cumulative GPA 2.75. Supervised field work experience in health promotion or health-related settings for students in the Exercise and Health option. Previously offered as HHP 4990.

HLTH 5113* Psychological Aspects of Health. Examination of the interactions of biological, psychological, social, and spiritual factors as they impact human health and disease. Previously offered as HHP 5113.

HLTH 5133* Environmental Health. Examination of health issues, etiology of disease, and control and prevention of major environmental health problems in industrialized and developing countries. Previously offered as HHP 5133.

HLTH 5233* Sexuality and Health. The study of human sexuality as it relates to the health and well-being of individuals in the community, college, school, and worksite settings. Particular emphasis will be on examining, developing, or modifying new programming related to sexuality and health. Previously offered as HHP 5233.

HLTH 5323* General Epidemiology. Examination of epidemiological theory and its methodological application to public health. Same course as MPH 5323*. Previously offered as HHP 5323.

HLTH 5453* Cultural Issues in Health. Examination of ways in which culture affects health and health care including perceptions of health, disease, treatments, and the values associated with these factors. The need for cultural sensitivity in health care is emphasized. Same course as MPH 5453. Previously offered as HHP 5453.

HLTH 5653* Philosophical Foundations of Health Education and Promotion. Exploration of key concepts, philosophies, ethical principles, historical events, theories/models, and responsibilities and competencies of public health promotion. Same course as MPH 5653*. Previously offered as HHP 5653.

HLTH 5683* Health Behavior Theory and Practice for Public Health. Theories and concepts of health behavior change and exploration of the application of theories to public health programs. Same course as MPH 5683. Previously offered as HHP 5683.

HLTH 5973* Designing Public Health Programs. Application of program design principles, including needs assessment, theoretical application, program planning and marketing. Same course as MPH 5973. Previously offered as HHP 5973.

HLTH 5983* Implementation and Evaluation of Public Health Programs. Application of program implementation and evaluation, including evaluation design. Same course as MPH 5983. Previously offered as HHP 5983.

Health Care Administration (HCA)

HCA 5000* Research and Thesis. 1-3 credits, max 6. Serves as the independent research and preparation of the thesis for the MS degree in Health Care Administration. Course includes the study of existing research and methodologies directly related to the individual discipline via computer, literature review, classroom and applied training. Same course as HCA 5010.

HCA 5010* Special Topics in Health Care Administration. Offered for variable credit, 1-3 credits, max 9. This course is designed to provide an overview of current issues in health care administration that relate to planning, leadership, legal, ethical and other related topics.

HCA 5013* Survey of Health Care Administration. Overview of current issues in health care administration that relate to planning, legal, ethical and other related topics.

HCA 5023* Human Resources in Health Care and Public Administration. Review, discuss and analyze current issues, rules, practices and governance of human resources in health care and public administration.

HCA 5033* Legal Issues in Health Care Administration. Explore, discuss and analyze current legal issues and topics that relate to all aspects of the health care professions.

HCA 5043* Organizational Leadership and Development in Health Care. Teaches leadership development theories, perspectives and skills found within health care organizations. Provides insight on leadership styles, team development, coaching and fostering growth. Prepares leaders for embracing change including globalization, knowledge management and sustainability.

HCA 5050* Directed Readings in Health Care Administration. Offered for variable credit, 1-3 credit hours, maximum of 3 credit hours. Focuses on specific topics of interest and emphasis in healthcare administration. Topics will be chosen or assigned for focused literature review.

HCA 5063* Health Care Compliance. Introduces general concepts as they relate to issues care compliance including legal issues, risk assessment, informed consent, credentialing, compliance and ethics.

HCA 5073* The Social Structure of Health Care Organizations. Sociology of health care with an understanding of the interconnectedness of financial incentives, social relationships, and health system performance. Examine the role physicians play in the social structure of health care institutions and the changing role of physicians in the health system.

HCA 5083* The Financial Structure of Health Care Organizations. Overview of the financial structure of the U.S. health care system in health organizations. Provide the non-financial health administrators tools to work effectively with financial professions to achieve organizational goals.

HCA 5093* Leadership Methods and Styles in Healthcare. Introduces leadership methods, styles and situations that are unique in the health care field. Interprets those styles through specific case studies. Discusses the importance of strategic leadership planning.

HCS 5103* Intro to Global Health. Highlights the chronic, emerging and re-emerging global health issues and examines possible measures to address them.

HCA 5113* Entrepreneurship and the Health Sciences. Introduces entrepreneurship as it relates to the health care industry. Includes concepts within the for- and non-profit sectors. Focuses on entrepreneurial competencies of creativity and innovation.

HCA 5123* Survey of Research and Evaluation in Health Care. Introduces a basic understanding of statistics used in healthcare and biomedical research and developing research from the biomedical bench to the final stages of clinical trials. Analyzes healthcare program outcomes.

HCA 5133* Health Care Informatics. Focuses on healthcare informatics for the entire spectrum within the medical community. Covers local and community applications to broad global initiatives.

HCA 5143* Relief and Development in Global Health. Explores the roles and interaction of intergovernmental and governmental agencies and NGOs involved in global health.

HCA 5153* International Health Systems. Provides an overview of the differences in global health care systems using a historical and sociopolitical context making extensive use of country case studies.

HCA 5163* Healthcare Accounting and Auditing. Introduces the unique aspects of healthcare accounting and auditing. Presents and discusses various accounting and auditing topics as they relate to healthcare administration.

HCA 5173* Emerging Global Infectious Diseases. Develops a realistic approach to addressing emerging global infectious diseases, emphasizing global health implications in the areas of prevention, surveillance, and control.

HCA 5183* Global Environmental and Occupational Health. Examines environmental health concerns in the context of public health, and the social, economic and other factors that mitigate the effects of environmental hazards or otherwise influence the population.

HCA 5193* Health Aspects of Disasters. Addresses important thematic areas such as types, phases and effects of disasters on health, public health and medical responses to infectious diseases and pandemics.

HCA 5203* Health Impact Assessment. Evaluates the connection between community design and public health by applying evidence to inform decision-making for new policies and plans.

HCA 5213* Advanced Cases in Healthcare Finance. Evaluates specific in-depth case studies in the financing and operations of different healthcare institutions.
The purpose of the course is to introduce and analyze the essential concepts and knowledge concerned with athletic training. Procedures relate to injuries and development of essential skills and competencies needed to perform selected athletic training procedures. Theory-based course with required lab experience.

HHP 2802 Medical Terminology for the Health Professions. Basic knowledge and understanding of medical language and terminology used in allied health and health professions.

HHP 2844 Clinical Examination and Diagnosis I. Lab 2. Prerequisite(s): 2654, 2733 and 2664. Advanced knowledge and skills related to the recognition, diagnosis and appropriate medical referral of injuries to the lumbar spine, pelvic and lower extremities.

HHP 2854 Clinical Examination and Diagnosis II. Lab 2. Prerequisite(s): 2654, 2664, 2733, and 2844. Advanced knowledge and skills related to the recognition, diagnosis and appropriate medical referral of injuries to the head, cervical and thoracic spine, upper extremities, abdominal and thoracic regions.

HHP 3010 Health and Human Performance Workshop. 1-3 credits, max 6. Concentrated study of selected areas of health and human performance, including problems in instruction and administration not usually addressed in the undergraduate curriculum.

HHP 3112 Radiography Evaluation and Assessment. Prerequisite(s): Full admission into ATEP clinical or pre-professional option. Introduction to the fundamental principles, equipment, and common methods and procedures of radiography.

HHP 3114 Physiology of Exercise. Lab 2. Prerequisites: MATH 1513. A study of various bodily systems, including major organs and tissues, and how they respond to acute and chronic exercise of varying intensity, duration and frequency.

HHP 3123 Principles of Personal Training. To develop an understanding of the basic skills and competencies in personal training and evaluation and prevention of the National Strength and Conditioning Association (NSCA) personal trainer certification exam. A detailed study of personal training inclusive of musculoskeletal and cardiorespiratory anatomy, resistance training, aerobic exercises, nutrition, health appraisal, fitness testing, flexibility, and plyometric training. The role of the personal trainer will also be addressed.

HHP 3133 Sport Supplements for Human Performance. To develop an understanding of the proper selection and administration of sport supplements, risk factors involved in consuming supplements, and discussion of how specific supplements may or may not affect performance.


HHP 3233 General Medical Concepts. Prerequisite(s): 2654, 2664, and ZOOL 3204. Principles of cellular and molecular biology. Application to human function. Special emphasis on comparisons to a wide variety of exercise, fundamental movement, sport and physical activity.

HHP 3243 Psychosocial Aspects of Sport and Coaching. Examination of the psychological aspects of sport that impact the performances of coaches and athletes.

HHP 3451 Athletic Training Practicum III. Lab 1. Prerequisite(s): Successful completion of 2461, 3802, and 3902. Directed observation in supervised intermediate and clinical experiences in athletic training.

HHP 3461 Athletic Training Practicum IV. Lab 1. Prerequisite(s): Successful completion of 3451, 3924. Directed observation in supervised intermediate and clinical experiences in athletic training.

HHP 3553 Theory and Practice of Coaching. The purpose of the course is to introduce and analyze the essential concepts and knowledge concerned with coaching in sports and related areas. This course provides a platform from which deeper knowledge in specific sub disciplines can be acquired through class specialization.

HHP 3563 Biomechanics. Prerequisite(s): 2654. The study of anatomical and mechanical phenomena underlying human motion. Application of biomechanical concepts to a wide variety of exercise, fundamental movement, sport and physical activity.
styles, implementation of behavioral goals and objectives through unit and lesson preparation, teaching methods and classroom management.

HHP 3763 Health and Physical Education for Elementary Age Children. Methods of teaching health and physical education to elementary age children. Theory and practical experience of health behaviors, movement skills and physical fitness.

HHP 3773 Methods in Teaching Secondary Physical Education. Prerequisite(s): HHP 1753, HHP 1823, HHP 1833, HHP 3433. Instructional styles, implementation of behavioral goals and objectives through unit and lesson preparation, teaching methods and classroom management.

HHP 3802 Therapeutic Modalities for Injury I. Lab 2. Prerequisite(s): 2654, 2664, CHEM 1314 and concurrent enrollment ZOOL 3204. Discussion and application of complementary and mechanical interventions used in the treatment of acute and chronic injuries to the musculoskeletal systems.

HHP 3883 Coaching Internship. Experience working with individual athletes, teams, coaches, and others in a practical setting.

HHP 3902 Therapeutic Modalities for Injury II. Lab 1. Prerequisite(s): 3802. Discussion and application of common electronic and physiologic devices used in the treatment of acute and chronic injuries to the musculoskeletal systems.

HHP 3924 Therapeutic Exercise. Lab 2. Prerequisite(s): 3802. Scientific methods used in therapeutic exercise and rehabilitation of injuries. Investigation of mechanisms of injury, anatomical structures involved and methodological approach in designing rehabilitative programs.

HHP 4010 Directed Study. 1-3 credits, max 6. Prerequisite(s): Written approval by department head. Supervised readings, research or independent study of trends and issues related to the area of health, physical education or leisure services.

HHP 4123 Principles of Strength and Conditioning. Designing and implementing safe and effective strength training and conditioning programs and apply exercise prescription principles for training, injury prevention, and reconditioning. This course is also designed to prepare students for the National Strength and Conditioning Association (NSCA) Certified Strength and Conditioning Specialist (CSCS) exam.

HHP 4243 Research Methods in Athletic Training. Prerequisite(s): STAT 2013. Interactive study of importance and process of conducting ethical research in athletic training and the healthcare professions. Emphasis placed on research design, ethics, collection of data, and the dissemination of results.

HHP 4451 Athletic Training Practicum V. Lab 1. Prerequisite(s): Successful completion of 3461. Directed observation in supervised advanced laboratory and clinical experiences in athletic training.

HHP 4461 Athletic Training Practicum VI. Lab 1. Prerequisite(s): Successful completion of 3233, 4451. Directed observation in supervised advanced laboratory and clinical experiences in athletic training.

HHP 4480 Internship in Health and Human Performance. 1-12 credits, max 12. Prerequisite(s): Last semester senior standing with cumulative GPA of 2.50. Supervised experience in school (physical education and health), community worksite or athletic training setting in order to qualify or prepare for appropriate teaching and professional certification.

HHP 4530 International Athletic Training. 1-3 credits, max 6. Explore and experience the techniques of prevention and care of athletic injuries in a culture outside of the United States. Course must be taken in two different countries to count as second time credit.

HHP 4643 School Health and Safety for Physical Educators. Health and safety content for which physical educators are held responsible.

HHP 4723 Assessment in Physical Education. Prerequisite(s): Full admission to professional education. Evaluation techniques commonly used by physical educators and health professionals to measure knowledge, attitudes, sport skill proficiency and physical fitness.

HHP 4733 Organization, Administration and Curriculum in Physical Education and Athletics. Prerequisite(s): 3753, 3773 or concurrent enrollment; admission into the professional practice, safety standards and resource management.

HHP 4983* Current Issues in Athletic Training. Prerequisite(s): 3663, 4451 and admission to athletic training program. Development of competencies set by the National Athletic Trainers Association Board of Certification. Current issues facing athletic trainers and the role in today’s health care systems.

HHP 5000* Master’s Thesis. 1-6 credits, max 6. Independent research required of candidates for master’s degree. Credit awarded upon completion of thesis.

HHP 5010* Seminar. 1-2 credits, max 4. Selected topics from the profession not covered in other courses. Presentation and critique of research proposals and results.


HHP 5030* Field Problems in Health and Human Performance. 1-3 credits, max 6. Individual investigations of issues in the areas of health and human performance.

HHP 5033* Advanced Techniques in Orthopedic Assessment. Knowledge in evaluating various upper and lower extremity orthopedic injuries.


HHP 5073* Psychological Aspects of Sport. Psychological foundations of sport emphasizing performance enhancement by athletes through psychological training techniques.

HHP 5122* Therapeutic Modalities I. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. Advanced knowledge in the application of common thermal and cryotherapeutic interventions for acute and chronic injuries as they related to evidence based practice.

HHP 5173* Therapeutic Interventions in Athletic Training. Advanced understanding of various methods of how to treat orthopedic injuries commonly

HHP 5523* Current Readings in Health. Contemporary research, literature, projections and views as applied to total health and well-being.

HHP 5530* International Athletic Training. 1-3 credits, max 6. Explore and experience the techniques of prevention and care of athletic injuries in a culture outside of the United States. Course must be taken in two different countries to count as second time credit.

HHP 5593* Human Electrocardiographic Interpretation. Prerequisite(s): 3114 or consent of instructor. Knowledge concerning the collection and interpretation of the electrocardiogram (EKG) and its relationship to heart anatomy, physiology and electrophysiology.

HHP 5603* Principles of Performance Enhancement. Prerequisite(s): 2654, 3114, ZOOL 3204. Theoretical foundation of specific tenets of exercise and performance enhancement. Upon successful course completion students will be eligible to sit for the National Academy of Sports Medicine (NASM) examination for NASM Performance Enhancement Specialist certification.

HHP 5613* Cardiac Rehabilitation. Prerequisite(s): 2653 and 3114 or equivalent. Factors involved in cardiovascular disease. History, implementation and administration of cardiac rehabilitation programs.

HHP 5703* Principles of Corrective Exercise. A scientific approach to corrective exercise program design and implementation.

HHP 5733* Motor Learning. Research in psychology and physical education relevant to the understanding of the nature and basis of motor skill learning.

HHP 5823* Applied Neuromuscular Anatomy and Physiology. Prerequisite(s): HHP 2654. Structure and behavior of the human body, especially as it pertains to movement. Particular emphasis will be placed on neuroanatomy, the muscular system, and the neuropsychological basis of human movement. An introduction to clinical motor-related disorders will also be provided.

HHP 5843* Quantitative Biomechanics and Kinesiology. Prerequisite(s): 5613. Analytical approach to the study of the human nervous system and human motion as applied to kinematic and kinetic analysis.

HHP 5853* Clinical Exercise Testing and Prescription. Prerequisite(s): HHP 3114. An in-depth study of the principles and application of clinical exercise testing including submaximal and maximal tests, oxygen consumption, and electrocardiography. Guidelines to prescribing individualized exercise plans will also be covered. Special attention will be paid to clinical variables and special populations.

HHP 5873* Human Bioenergetics. Prerequisite(s): 3114. Human energy production, utilization and storage in response to exercise.

HHP 5894* Biochemistry of Exercise Lab Methods. Lab 2. Prerequisite(s): Consent of the instructor. Practice using basic laboratory skills which can be applied to sophisticated techniques in biochemical analysis. General biochemistry as it relates to exercise metabolism, laboratory procedures, calculations, common lab problems and solutions and laboratory safety procedures.

HHP 6000* Doctoral Dissertation. 1-25 credits, max 25. Required of all
candidates for the Doctor of Philosophy degree. Credit is given upon completion of the dissertation.

HHP 6010* Independent Study in Health and Human Performance. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Supervised readings, research or independent study of trends and issues related to the areas of health and human performance.

HHP 6020* Research Colloquium. 1-3 credits, max 3. Exploration and presentation of selected topics and research in health and human performance.

HHP 6023* Special Topics in Health and Human Performance. Prerequisite(s): Admission to the Graduate College. Special topics related to health and human performance. Investigation, discussion and analysis of contemporary topics.

HHP 6053* Advanced Research in Health and Human Performance. Prerequisite(s): Graduate elementary statistical methods course. In-depth study of selected surveys and experimental research in HHP, including questionnaire development, survey methodology and analysis of data.

HHP 6063* Statistical Computing and Proposal Writing. Prerequisite(s): Consent of instructor. Instruction in the use of SPSS using a personal computer. Preparation of research proposals.

HHP 6723* Curriculum Development in Health, Leisure and Human Performance. Prerequisite(s): Admission to the Graduate College. Identification and analysis of curriculum theories with emphasis on traditional and innovative approaches to curriculum design for programs in health, leisure and human performance.

Higher Education and Student Affairs (HESA)

HESA 1113 Orientation in Student Athletics. To assist students to better understand and comply with the academic and athletic demands on student-athletes at a NCAA Division I university, including NCAA compliance issues.

HESA 2513 Foundations of Ethical Leadership. Prerequisite(s): 24 hours in good standing; admission into the UGLC or consent of instructor. Introduces students to a variety of theoretical views of ethics and leadership studies through the investigation of contemporary ethical challenges and the development of foundational leadership skills to meet those challenges. (Same course as EPSY 2513).

HESA 3013 (S) Leadership Concepts. Prerequisite(s): 12 hours completed course work. Increases undergraduate student competence through the study of leadership concepts. Stresses communications, decision-making, leadership styles and theories and group dynamics. Attempts integration of the theoretical concept with reality of application within the university community.

HESA 3091 Student Development Theory for Orientation Leaders. Prerequisite(s): Consent of instructor. Theories of student development. Topics include helping skills, student leadership community building, communication skills, and multicultural sensitivity. Application of theory to university orientation programs.

HESA 3092 Student Development Training for Resident Assistant. Theories of student development. Topics include helping skills, community building, communication skills, and multicultural sensitivity. Application of theory to living groups.

HESA 4513 Ethical Leadership for the Common Good. Prerequisite(s): HESA 2513 or EPSY 2513. Builds on foundational knowledge of ethical theory and leadership studies through application of ethical theory and leadership skills to specific contexts and evaluation of their results. (Same course as EPSY 4503)

HESA 5000* Master’s Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of instructor.

HESA 5173* Introduction to Student Affairs. History, philosophy, and goals of student affairs units in colleges and universities; emphasis on practitioner roles and responsibilities.

HESA 5213* Student Development Theory. Examination of theories describing patterns of growth and development during the college years. Implications for the design of education practice on the college campus.

HESA 5223* Career Development for College Students. In-depth exploration of issues and contemporary theory related to the topic of career development for college students.

HESA 5233* Advanced Student Development Theory. Prerequisite(s): HESA 5213. Focus is on contemporary and emerging theories of traditionally aged college student development from cognitive, spiritual, gender, racial identity, and student success families.

HESA 5320* Seminar in Student Development. 3-6 credits, max 6. Prerequisite(s): Consent of instructor. In-depth exploration of contemporary problems in student development and student affairs administration.

HESA 5533* Effective Leadership in Student Services. Prerequisite(s): HESA 5173 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.

HESA 5433* Group and Cultural Interventions in Student Affairs. Prerequisite(s): Consent of instructor. Explores group theory, dynamics and cultural dimensions as these factors relate to working with college students and advising student groups in a higher education environment.

HESA 5463* Legal Issues in Student Affairs. Prerequisite(s): HESA 5173 or HESA 6173. Legal issues confronted by entry-level student affairs practitioners, how to recognize these issues, and how to act within the parameters of the law.

HESA 5733* Environmental Theory and Student Affairs. Prerequisite(s): Consent of instructor. Examination of campus environmental theory providing an understanding of campus environments approach to student affairs practice.

HESA 5973* Foundations of Higher Education. Overview of the historical background and philosophical foundations of American higher education.

HESA 5983* Administrative Issues in Higher Education. Overview of the organization and administration operations and analyses of social, political and legal influences on colleges and universities.

HESA 6000* Doctoral Dissertation. 1-9 credits, max 15. Prerequisite(s): Consent of instructor. Required of all candidates for doctorate in Educational Leadership and Policy Studies.

HESA 6163* International Issues in Higher Education. Examines current international issues in higher education.

HESA 6173* Administrative Issues in Student Affairs. Develops an understanding of the history, philosophy, student life, critical issues and administration of student personnel work in higher education.

HESA 623* Higher Education Student Personnel Services. Prerequisite(s): HESA 6173 or consent of instructor. Higher education student personnel services such as: admissions, orientation, student activities, financial aids, housing, and counseling.

HESA 6220* Internship in Higher Education and Student Affairs. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Work and study opportunities under supervision in student affairs functional areas and/or college or university administrative units, and other appropriate work settings.

HESA 6233* Critical Issues in Higher Education and Student Affairs. Issues that have shaped and are shaping the practice of higher education and student affairs administration in American society.

HESA 6463* Higher Education Law. National and state constitutional provisions, laws, and court cases concerning higher education. Considerable legal research required.

HESA 6553* Public Policy and Higher Education. Examines the relationships between government and higher education in the United States, focusing on the roles and impacts of policy arenas beyond the local college or university.

HESA 6573* Institutional Research and Policy Analysis. Introduction to the processes and procedures of institutional research and policy analysis, as they are utilized within the context of American higher education.

HESA 6583* The Impact of College on Students and Society. The psychological and sociological impact that attending four-year colleges and universities has on undergraduates from their freshman year until they graduate.

HESA 6683* The Community Junior College. The American two-year college is examined from historical and philosophical development, curricular content and the learning process, faculty and instruction, administration and governance, support and control. Principles, practices and problems of community colleges in America.

HESA 6703* Finance in Higher Education. 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.

HESA 6733* Planning and Educational Change. Organizational and environmental parameters, sources of change, barriers to change, and strategies for planning and implementing organizational change.

HESA 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.

HESA 6803* Administration in Higher Education. 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.

HESA 6823* Educational Leadership. Leadership and the implications of leadership across contexts, cultures and time.

HESA 6833* College and University Presidency. The role and function of the presidency. For those who anticipate a career in college and university administration or a related management position.

HESA 6843* The Academic Department. Organization and administration in higher education emphasizing an analysis of the academic department and its leadership through the department head.

HESA 6853* Research Traditions in Higher Education and Student Affairs. Exploration of advanced integrated research strategies and the development of designs and methods supporting the field of higher education and student affairs administration.

HESA 6863* University and College Campus Culture. This course examines the concept of institutional and collegiate culture as a lens to understanding higher education institutions and their various stakeholders.
HESA 6903* Dissertation Proposal Writing. Assists doctoral candidates in the Higher Education and Student Affairs program with the development of Chapters One through Three of their dissertation proposals.

History (HIST)

HIST 1010 Studies in American History. 1-2 credits, max 2. Special study in American history to allow transfer students to fulfill general education requirements as established by Regents’ policy.

HIST 1020 Freshman Historical Research Methods. 1-3 credits, max 3. Prerequisite(s): Requires consent of instructor. For lower-division students interested in learning research methods in history while working on a research project with an individual faculty member. Preference given to students in A&S Freshman Research Seminar.

HIST 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 POLS 1113, the State Regents requirement of six credit hours of American history and American government before graduation. No degree credit for students with credit in 1483 or 1493.

HIST 1483 American History to 1865. From European background through the Civil War. Intended for Education majors seeking certification as Social Studies teachers. No degree credit for students with credit in HIST 1103.

HIST 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. Intended for Education majors seeking certification as Social Science teachers. No degree credit for students with credit in HIST 1103.

HIST 1613 (H) Western Civilization to 1500. History of western civilization from ancient world to Reformation.

HIST 1623 (H) Western Civilization after 1500. History of western civilization from Reformation to present.

HIST 1713 (H) 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.

HIST 2013 Introduction to the Study of History. This course is an introduction to the study of history. It offers an overview of the development of the discipline, historiography, and the philosophy of history. Students learn about the methodology of history, types of historical problems, habits of thought necessary for the discipline, and methods such as research and writing.

HIST 2023 (H) History of the Present. Introduction to the study of history through the lens of current events and contemporary issues, with a focus on America in a global context.

HIST 2113 World History. Development of civilization, primarily western, in modern world; how rise of cities and national states and expansion of man’s knowledge of physical and human environment molded civilization of modern and present day world.

HIST 2213 (H) World History from Ancient Times to 1500. This course examines the development of social, cultural, economic, and political systems from ancient times to the beginning of the sixteenth century. We will examine the growth of empires, trade routes, religions, and culture in Asia, Africa, the Americas, and Europe. This course will examine the ways in which these societies connected and made contact with each other through trade, warfare, and migration and the resulting exchange of ideas.

HIST 2223 (H) World History 1500 to Present. This course surveys world history from 1500 to the present day. The course will track the formation of the “modern” world through a study of changes in political situations, culture, and society. The course will examine topics such as changes in science and technology, culture and religion, the expansion and decline of empires, the growth of the nation state, and the rise of globalization. The class will emphasis the role of changing definitions and roles of race, social class, and gender in shaping historical events.

HIST 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.

HIST 2333 (H) American Thought and Culture: Survey. Survey of American religious, philosophical, artistic, and scientific ideas and their impact on culture and values.

HIST 2343 (H) Religion in America. Survey of the history of religion in America and its impact on social reform, politics, and intellectual life.

HIST 3003 (LS) Soviet Union: History, Society and Culture. A comprehensive view of the Soviet Union, stressing those issues in the political, economics, technological, geographical, and cultural spheres which are most relevant to the current situation. Accessible to beginning undergraduates. (Same course as POLS 3003 & RUSS 3003)

HIST 3013 (H) Ancient Egypt and Israel. The Ancient Near East with a focus on Egyptian and Israelite history, from the earliest times to the 5th century B.C.

HIST 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.

HIST 3033 (H) Ancient Rome. Political, social, economic and cultural history of the Roman Republic and Empire.

HIST 3043 (H) Ancient Mesopotamia: Iraq, Iran & Syria from 4000-333 B.C. From the birth of civilization to the end of the Persian Empire, this course examines the history, archaeology and cultures of the fertile crescent.

HIST 3053 (LS) Introduction to Central Asian Studies. A comprehensive view of newly-emerged Central Asian states examining the history, politics, economics, geography, and culture of Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan as reflected in their thoughts, religion, literature, and architecture, in the past, and the strategic importance of their natural wealth for the present and future. (Same course as GEOG 3053, POLS 3053 & RUSS 3053)

HIST 3113 (H,J) Germany Since 1815. Creation of a centralized state in Germany; impact of World War I and the subsequent failure of the Weimar Republic; rise of national socialism, totalitarianism, and the Third Reich; German experience in WWII, repression of minorities, and the Holocaust; post-war Germany and modern reunification.

HIST 3123 (H,J) The History of Modern Africa. The course will cover the history of Modern Africa from 1750 to the present. The class will begin with a general overview of the background and history of ancient and early modern Africa, and move forward with examinations of colonial and contemporary African culture, society, and politics. The course will have a particular focus on African perspectives on the West, and the effects of the slave trade, imperialism, and globalization on modern day Africa. Students will analyze many different types of sources including films, artwork, graphic novels, novels, and poetry.

HIST 3133 (H) African Diaspora History. Introduction to the origin, development, and maturation of the African Diaspora in the Americas and the Caribbean, from the transatlantic slave trade to the mid-20th century. Emphasis is placed on a critical reading and discussion of a selection of essays, historiographies and primary materials on diasporic and transnational experiences and identities of Africans, African descendants, and Caribbean transmigrants.

HIST 3153 (H) Russia to 1861. Political, institutional, societal and economic development of Russia from the Kievan period to the Great Reforms.

HIST 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.

HIST 3203 (H) The Medieval World, 500-1500. The society and culture of Europe, Byzantium and the Middle East, 500-1500. Emphasis on social, cultural, religious, and political developments.

HIST 3223 (H) Late Medieval World, 1000-1450. The Late Middle Ages in Europe and its ties to the Middle East. Examines the period of the Black Death, Hundred Years War, early Renaissance, and the flourishing of new forms of government, religious life and social upheaval. Emphasis on social, cultural, religious, and political developments.

HIST 3243 (H) Renaissance, 1350-1517. The development of the Renaissance from the Italian city-states to the New World. Political development, cultural innovation, and the role of disease in history.

HIST 3253 Absolutism and Enlightenment, 1648-1789. Political, economic, social, intellectual and religious transformation of Europe between the Peace of Westphalia and the French Revolution.

HIST 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.

HIST 3273 (H,I) 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.

HIST 3323 (H) Modern France, 1789-Present. French politics, economy, society, and culture from the defeat of Napoleon to France’s post-World War II “rebirth.”

HIST 3333 (H,I) History of the Second World War. Problems leading to World War II with their international implications and consideration of the war years.

HIST 3343 (H) World War I in Modern European Culture. Analysis of the war as the principal event determining the course of twentieth century European history: battles, home fronts, personal, literary and artistic expression.

HIST 3353 (H) Mediterranean World. Examination of the cultural and social encounters between East and West, Christian and Muslim. The meeting point for three world cultures and three continents explored in the following themes: pilgrimage, commerce, slavery, intellectual exchange, warfare, and minority communities.

HIST 3363 (H) Popular Religion in the West, 1300-1700. The study of the religious experience of both lay people and clergy between 1300 and 1700, when their religious worldview underwent fundamental challenges and changes.
The effort to understand the relationship between the secular world and the supernatural will be explored through devotional ideas, practices and religious rituals.

HIST 3733 (H) Invasion and Identity: The Medieval English World: 700-1400. Medieval English history through Britain’s experience of invasion and settlement: includes the Vikings, Normans and England’s conquest of Britain and parts of France. Emphasis on social, cultural, political and religious history.


HIST 3393 (H) 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.

HIST 3403 (H) East Asia to 1800. Traditional Chinese civilization and its impact on Japan, Korea and Southeast Asia.

HIST 4413 (H,I) 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.

HIST 4323 (H,I) Modern Japan. Modernization process in Japan since 1868.

HIST 4333 (H,I) Modern China. Response of China to the West since 1840, with stress on economic, social and intellectual currents.

HIST 4433 (H) Gender Relations in Chinese History. Men’s and women’s social, cultural, political, economic, family, and sexual experiences in Chinese history; particularly women’s own voices and efforts in pursuing their own goals and aspirations.

HIST 4543 (H) Colonial Latin America. Impact on the Indian cultures of Spanish and Portuguese conquerors, priests, administrators and entrepreneurs in the creation of a New World society, Class structure, 18th century reforms, and independence movements.


HIST 4843 (H) Reformation Europe, 1517-1648. Development and impact of religious reform movements, overseas expansion, state building, the Scientific Revolution, and the Thirty Years’ War on European civilization.

HIST 4943 (H,I) Scandinavia Since 1500. Exploration of Scandinavia from 1500 to the present. Focus on key historical and contemporary questions such as the development of Lutheran reformation, the Scandinavian welfare state, and multiculturalism.

HIST 5053 (H) Islamic Civilization 600-1800. Rise of Islam in Arabia and subsequent spread to Africa, Asia and Europe. Nature of Islamic civilization through discussions of legal, political, social, cultural and economic institutions established in the Middle Ages as well as diversity of Islamic traditions.

HIST 5153 (H,I) Modern Middle East Since 1800. Main political events, social institutions, cultural and economic developments, as well as various aspects of everyday life in the Middle East since 1800. Transformation of traditional society, imperialism and independence, Arab nationalism, Arab-Israeli conflict, the impact of oil, westernization, the rise of militant Islam, and the prospects of democratization.

HIST 5233 (H,I,S) History of South Asia 1700-Present. The course will examine the histories of India, Pakistan, Bangladesh, and Sri Lanka. It will focus on the historical changes in South Asian politics, culture, economics and society beginning with the growth of European imperial influence in the region and end with an examination of the issues facing these nations in the present day.


HIST 5553 (H,I) Media and Popular Culture in the Arab Middle East. Popular culture throughout the Arab-speaking world in light of the most important political and economic events of the 19th and 20th centuries.

HIST 5733 (H) The Mongol Empire. Genghis Khan is infamous for destruction of his conquests, yet his empire grew to be the largest land empire in history, and spun a diplomatic web of contacts on a far wider scale than ever before. This course traces the Mongol Empire from Genghis himself to the legacy of the divided Mongol khanates. Attention will be paid to the Mongol Empire’s institutional structure, political and cultural dynamics, contacts with Europe, and historical methods for using primary sources.

HIST 5853 (H) Minorities and Diversity in the Middle East. The Middle East has long been a melting pot, or mosaic, of different groups. Large parts of the region have been even ruled by minorities. This course will explore the history of social diversity in the Middle East, including ways that ethnic and religious minority groups interacted with rulers, the majority, and each other, whether peacefully or not. The effects of long-term social diversity will bring discussion to the contribution of minority groups to the Middle East as we know it today.

HIST 3613 (H) American Colonial Period to 1750. Colonization of British and French North America; colonial political, social, cultural, intellectual and economic development; international rivalries; the imperial structure.

HIST 3623 (H) Era of the American Revolution. British imperial problems; the American Revolutionary; political, economic, social and religious change; the War for Independence; the Articles of Confederation; the critical years.

HIST 3633 (H) 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.

HIST 3643 (H) The Jacksonian Era, 1828-1850. Development of a modern political system and an entrepreneurial economy; social reform; territorial expansion; and sectionalism.

HIST 3653 Civil War and Reconstruction, 1850-1877. Causes, decisive events, personalities and consequences of the disruption and reunion of the United States.

HIST 3663 (H) 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.

HIST 3673 (D,H) United States History, 1919-45. The political, economic, social and cultural changes in the United States from 1919 to 1945, the 1920s, the Depression, the New Deal, WWII, and domestic impact of the war.

HIST 3683 (D,H) United States History Since 1945. The political, social, and cultural history of the United States since World War II. Topics include the Cold War at home and abroad, the Civil Rights and other social movements, 1960s culture vs. counterculture, the Vietnam War, Watergate, Reagan’s America, the War on Terror, and modern globalization.

HIST 3693 (H) The Modern West. Social, political, economic changes that define the twentieth-century American West.

HIST 3713 (D,H) Women in the American West. Introduction to the history of women in the American West from pre-contact to present, with emphasis on cultural diversity, women’s roles as economic and social partners, and the many ways women were active participants in western development. This course incorporates Oklahoma and public history using written documents, art, film, museum and archival materials, and local historical sources.

HIST 3753 (D,H) 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.

HIST 3763 (D,H) 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.

HIST 3773 (S,O) Old South. Social, political and industrial conditions in the South before the Civil War.

HIST 3793 Native American History. Introduction to the history of Native American peoples from encounters with European colonists to the present, with an emphasis on tribal nationhood and sovereignty, war and diplomacy, treaty rights and federal policies, indigeneity in modern contexts, and a leadership in Indian Country.

HIST 3803 (H) Food and Culture. This course offers an interdisciplinary examination of the history and culture of food production and consumption in the US with an emphasis on how US food ways relate to those of other countries. It examines such topics as: food and the formation of social bonds, food and identity, the cultural meaning of food ways, issues of justice and equality in food production and consumption, and how food cultures have developed over time and in relation to other societies. Same course as AMST 3733 and AG 3733.

HIST 3913 (H) History of Medicine. Historical growth of medicine and its relationship to the society in which it develops. Scientific problems, cultural, religious, and medical.

HIST 3953 Religion in Modern Europe. Religions thought and experience as influences on the politics, economy, and general culture of European nations from the 17th century to the present.

HIST 3963 (H) Ideas and Ideologies in Modern Europe. Prerequisite(s): 1623. Intellectual and ideological developments in modern Europe, including political, social, and cultural factors and their influence on European leaders. U.S., and historical methods for using primary sources.


HIST 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. No credit for students with credit for 3663.

HIST 4073 Digital Methods in History. Introduction to the methods and practice of working with digital sources, creating digital content, basic
Overview of the history of U.S. 

Prerequisite(s): Graduate

Cultural, societal and political reflections

American society in

Examines the ways in which historical

Introduction to the methods

Examination of the ways

Civil-military relations, the

The development of technology in western

3 credits, max 39. Prerequisite(s):

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Prerequisite(s): Graduate student standing.

1-19 credits, max 30. Prerequisite(s):

interpretation of American history from the colonial era to the present day. Uses or lower-division survey course in U.S. History, any period. A transnational

HIST 4573  (H) Women in Western Civilization.

of masculinity and femininity. (Same course as AMST 4553)

HIST 4553  (D)  Gender in America.

in popular memory and culture.

HIST 4543  (H,I)  Vietnam War.

changing ways society (from Native American to post-industrial) has defined,

HIST 4523  (H)  American Environmental History.

Euro-American pioneers, women, people of color, and the tribal peoples of the

popular culture. These frontiers include those informed by imagery related to

HIST 4493  (D,H)  Frontier in American Memory.

may be taken independently. Emphasis on nonpolitical aspects of American

HIST 4483  (H)  American Cultural History Since 1865.

immigration, education, religion, reform, world influences; ends with Civil War.

HIST 4463  (H)  American Cultural History to 1865.

history of African Americans from the end of the Civil War to the present. Topics

abolitionist movement; and conditions of free blacks.

HIST 4403  (H)  American Urban History.

American communities from 1865 to the present. Evolving political and social

HIST 4503  (H)  American Urban History.

frontiers have been remembered, especially in popular culture. These frontiers include those informed by imagery related to

HIST 4493  (D,H)  Frontier in American Memory.

in which several American frontiers have been remembered, especially in

HIST 4483  (H)  American Cultural History Since 1865.

The primary focus involves examining the relationship between historical events and the ways in which those events are depicted, commemorated, memorialized, remembered and misremembered in film.

HIST 4463 (H) American Cultural 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.

HIST 4483 (H) American Cultural History Since 1865. Continuation of 4463; may be taken independently. Emphasis on nonpolitical aspects of American society and thought and on world influences.

HIST 4493 (D,H) Frontier in American Memory. Examination of the ways in which several American frontiers have been remembered, especially in popular culture. These frontiers include those informed by imagery related to Euro-American pioneers, women, people of color, and the tribal peoples of the American West.

HIST 4503 (H) 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.

HIST 4513 (S) American Economic History. Economic development and economic forces in American history; emphasis upon industrialization and its impact upon our economic society since the Civil War. (Same course as ECON 3823)

HIST 4523 (H) American Environmental History. Examination of the changing ways society (from Native American to post-industrial) has defined, interpreted, valued, and used nature.

HIST 4543 (H,1) Vietnam War. Origins of the Vietnamese struggle against colonialism, international policy, making of military strategy and diplomacy, anti-war movement, impact on the war on soldiers and civilians, reflections of the war in popular memory and culture.

HIST 4553 (D) Gender in America. Cultural, societal and political reflections of American men and women from the colonial era to the present. Examination of the women's movement and their opponents, Exploration of changing notions of masculinity and femininity. (Same course as AMST 4553)

HIST 4563 (H,1) Cold War. International perspectives on the origins, conflicts and ideologies of the Cold War, the nuclear arms race, impact on daily life, cultural reflections, the collapse of communism, victors and losers in the post Cold War world.

HIST 4573 (H) Women in Western Civilization. Women in the development of Western Civilization from the earliest times to the present.

HIST 4583 History of Technology. The development of technology in western civilization. The relationship between science and technology and the effect of technology on society.

HIST 4593 (H) America in International Perspective. Prerequisite(s): 1103 or lower-division survey course in U.S. History, any period. A transnational interpretation of American history from the colonial era to the present day. Uses a variety of interdisciplinary sources to place the history of the United States within a comparative, global framework. (Same course as AMST 4593)

HIST 4603 (H, I) History of Energy. This course is aimed at exploring how humans have produced and consumed energy from the earliest Paleolithic settlements up to the modern era. Coverage emphasizes North America but includes energy production and consumption from throughout the world.

HIST 4900 Senior Seminar. Prerequisite(s): HIST 203; History major or consent of instructor. An introduction to historical research for senior history majors. Students will be required to select, research, and write a seminar paper based on primary documents and use standard footnoting and bibliographical methods.

HIST 4900* Topics in History. 1-3 credits, max 9. For students interested in pursuing either a research or a reading project. Open to honors students in history and to others by permission of the department head.

HIST 4990 Undergraduate Internship. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. History related internship experience designed to introduce majors to career possibilities.

HIST 4993 Senior Honors Thesis. Prerequisite(s): 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 history.

HIST 5000* Thesis. 1-6 credits, max 6.

HIST 5021 Teaching History at the College Level. Survey of objectives and methods in the teaching of history at the college level.

HIST 5023* Historical Methods. Methods of historical research and the writing of history.

HIST 5030* Public History Internship. 3-6 credits, max 6. Prerequisite(s): Consent of graduate committee. Supervised practical experience in applied history.

HIST 5033* Introduction to Public History. Prerequisite(s): Graduate student standing. Introduction to theory and practice of public history. Includes public history careers, public history as a field in the discipline, and the public perception and use of the past.

HIST 5053* Museum Studies. Prerequisite(s): Graduate student standing. Introduction to museum theory and practice, especially as it pertains to history museums and sites.

HIST 5063* Historic Preservation. Prerequisite(s): Graduate student standing. Studies 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. No credit for students with credit in 4063.

HIST 5073* Digital Methods in History. Introduction to the methods and practice of working with digital sources, creating digital content, basic foundations of software and metadata for digital archives, introduction to web design and database construction.

HIST 5120* Reading Seminar in American History. 3 credits, max 15. Historiographical and bibliographical study of special areas of American history.

HIST 5140* Reading Seminar in European and World History. 3 credits, max 15. Historiographical and bibliographical study of special areas of European and World history.

HIST 5220* Research Seminar in American History. 3 credits, max 15. Research in selected problems in American history.

HIST 5240* Research Seminar in European and World History. 3 credits, max 15. Research in selected problems in European and World history.

HIST 6000* Doctoral Dissertation. 1-19 credits, max 30. Prerequisite(s): Admission to candidacy. Advanced research in history.

HIST 6023* Historiography. Major writers of history, historical schools and patterns of developments in historical interpretation from the earliest times to present.

HIST 6100* Directed Readings in History. 1-3 credits, max 36. Prerequisite(s): Graduate student standing. Readings in selected topics in history to develop factual knowledge, analytical skills, and interpretive understanding.

HIST 6120* Creative Component. 1-3 credits, max 36. Research in designated topic in History resulting in the preparation of a major paper demonstrating historiographical and bibliographical command of subject. Required for students in Plan III of MA program.

HIST 6130* Graduate Studies in History. 3 credits, max 39. Prerequisite(s): Graduate student standing. Graduate-level work under taken in association with upper-division lecture courses. Added component ordinarily entails a graduate-level research paper or historiographical essay of substantial length.
Honors College (HONR) 1000 Introductory Honors Topics. 1-3 credits, max 6. Prerequisite(s): 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.

HONR 1013 (H) The Ancient World. Prerequisite(s): 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 degree credit for students with prior credit in HONR 2113.

HONR 1023 (H) The Middle Ages and Renaissance. Prerequisite(s): 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 degree credit for students with prior credit in HONR 2113.

HONR 1033 (H) The Early Modern World. Prerequisite(s): Honors Program participation. Interdisciplinary study of art, history, philosophy and literature from the late Renaissance to the mid-19th century. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student. No degree credit for students with prior credit in HONR 2223.

HONR 1043 (H) Romanticism to Postmodernism: 19th and 20th Centuries. Prerequisite(s): Honors Program participation. Interdisciplinary study of art, history, philosophy and literature from the 19th century to the present. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student. No degree credit for students with prior credit in HONR 2223.

HONR 1093 (A) Patterns and Symmetry in Mathematics. Prerequisite(s): Honors Program participation. Tesselations, or repetitive patterns in the plane and in space, and the symmetries, or rigid motions, that preserve them. Illustrations from art, architecture, science, and nature. For the Honors student.

HONR 2013 (S) Honors Law and Legal Institutions. Prerequisite(s): 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.

HONR 2023 (D) Constitutional Dimensions of Diversity. Prerequisite(s): Honors College participation. An introduction to American constitutional law as it relates to diversity issues through the study of landmark Supreme Court decisions affecting the rights of various minorities. Introduction to legal research techniques.

HONR 2063 (H) Ethical Issues Across Cultural Perspectives. Prerequisite(s): 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 ethnicity 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.

HONR 2514 Honors Scientific Inquiry. Lab 2. Prerequisite(s): Honors Program participation. A team-taught interdisciplinary course dealing with philosophy of science and the application of the scientific method in the natural and social sciences. Selected topics that involve interdisciplinary scientific inquiry. For the Honors student.

HONR 3000 Advanced Honors Topics. 1-3 credits, max 6. Prerequisite(s): 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.

HONR 3013 (H.J) Holocaust Studies Seminar. Prerequisite(s): 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.

HONR 3023 (H.J) Contemporary Cultures of the Western World. Prerequisite(s): Honors College participation. Interdisciplinary examination of selected cultures of Europe and the western hemisphere. Emphasis will be on identification of main characteristics of "Western" culture and their manifestations in a variety of modern societies on both sides of the Atlantic Ocean. Key values, institutions, and practices will be examined to illustrate the twin themes of commonalities and cultural diversity. The course is team taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student.

HONR 3033 (I.S) Contemporary Cultures of the Non-Western World. Prerequisite(s): Honors College participation. Interdisciplinary study of contemporary cultures of non-western world including lifestyle, housing and food. Team-taught by faculty from appropriate disciplines in a lecture and discussion format.

HONR 3043 (D.S) Contemporary Cultures of the United States. Prerequisite(s): Honors Program participation. Interdisciplinary study of racial and ethnic diversity in the United States in context of social, political, and economic systems to promote knowledge of racial and ethnic minority groups in the United States and appreciation of their contributions to the mosaic of contemporary American life. Team-taught by faculty from appropriate disciplines in a lecture and discussion format.

HONR 3053 (D,H) Biology, Race, and Gender. Prerequisite(s): Honors College participation. Critical interdisciplinary investigation of relationships between biology and gender, race, and social and ethical issues. Attention to views of alleged biological aspects of perceived racial and gender differences and attempts to implement these views socially, legally, and medically in the United States and elsewhere.

HONR 4993* Honors Creative Component. Prerequisite(s): Honors Program participation, senior standing, and approval of 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) HORT 1003 Home Horticulture. Offered by correspondence only. An introduction to horticultural practices for the home gardener. Planning and care of home grounds, home orchards and vegetable gardens; selection, use and care of indoor plants. Non-majors only. Credit will not substitute for required courses.

HORT 1013 (L.N) 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.

HORT 2010 Internship in Horticulture or Landscape Management. 1-6 credits, max 6. Prerequisite(s): 24 credit hours and consent of adviser. Students will approach experience with approved public and private employers in horticulture, landscape management, or related fields. Credit will not substitute for required courses. Graded on a pass-fail basis.

HORT 2123 Environmental Issues in Horticultural Science. Impact of urban and suburban development on the environment and a study of horticultural solutions to limit or reverse environmental damage. Emphasis on horticultural design, construction, and maintenance techniques as they relate to the conservation of water, soil, native species, and ecosystems.

HORT 2513 Herbaceous Plant Materials. Lab 2. Identification, cultural requirements, and use of ornamental garden and indoor herbaceous plants.

HORT 2613 Woody Plant Materials. Lab 2. Identification, cultural requirements, and use of ornamental woody plants including deciduous and evergreen trees, shrubs and vines.

HORT 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.

HORT 3013 Arboriculture. Lab 2. Prerequisite(s): 2613 or NREM 2134 and SOIL 2124. Theory and practice of selecting, planting and maintaining trees, shrubs and vines in the landscape.

HORT 3084 Plant Propagation. Lab 2. Prerequisite(s): 1013 or PLNT 1213, BIOL 1404 and SOIL 2124. Theory and practice of selecting, planting and maintaining trees, shrubs and vines in the landscape.

HORT 3113 Greenhouse Management. Lab 3. Prerequisite(s): 1013, BIOL 1404, MATH 1483 or 1513 or above. 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.

HORT 3153 Turf Management. Prerequisite(s): 1013, SOIL 2124 and 2 hours plant science. Selection, establishment and maintenance of grass species and other plant materials for special use areas.

HORT 3123 Fruit and Nut Production. Prerequisite(s): 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.

HORT 3253 Personnel and Business Management for Horticulture. Prerequisite(s): 1013 or LA 1013 and one upper division HORT or LA course. Preparing and executing an operational budget in a horticultural service industry and methods for maintaining an effective work force.

HORT 3433 Commercial Vegetable Production. Prerequisite(s): 1013, SOIL 2124 and BiOL 1404. Commercial production and marketing of vegetable crops.

HORT 3513 Landscape Irrigation. Lab 2. Prerequisite(s): 1013 or LA 1013. Basics of landscape irrigation with an emphasis on residential irrigation design, maintenance and installation.

HORT 3612 Bidding and Estimating. Prerequisite(s): 1013 or LA 1013 or NREM 1114 or PLNT 1213. Bid preparation and job cost estimation for landscape related projects including quantity take-offs, plant material and horticulture estimates, budgeting and pricing.

HORT 3713 Urban Horticulture Production. Prerequisite(s): 1013. Principles
and production of crops for public or community practices with emphasis on production associated with hydroponics, raised beds, containers, controlled environments, roof tops, high tunnels, and farmers markets.

HORT 4053 (I) International Experience in Horticulture. Participation in international travel to develop an understanding of different horticultural systems and technologies used outside the U.S.

HORT 4102 Stress Physiology. Prerequisite(s): BIOC 3653 and BOT 3463 or HORT 4963. 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. Offered in combination with HORT 5133. No credit for both HORT 4133 and 5133.

HORT 4313* Commercial Flower Production and Marketing. Lab 3. Prerequisite(s): 3113. Commercial production of cut flower, pot plant and bedding plant crops. Application of plant physiological principles to crop culture, crop production costs and marketing.


HORT 4493 Athletic Field Management. Prerequisite(s): HORT 3153. Principles, practices and challenges associated with natural turf-covered athletic field management; field construction, maintenance and evaluation of playing surface quality, soil physical properties influencing management and field use, construction and maintenance materials specification, and traction, hardness and ball response factors. Offered in combination with HORT 5493. No credit for both 4493 and 5493.

HORT 4543* Sustainable Nursery Production. Lab 2. Prerequisite(s): HORT 2613 and 3463. Sustainable commercial production of field and container-grown woody ornamental crops. No credit for both HORT 4543 and HORT 5543.

HORT 4713* Public Garden Management. Lab 4. Prerequisite(s): 1013. Issues and methods in public garden management, including database management of collections, conservation of native species, grant writing, volunteer coordination, computerized mapping systems, master planning, and other topics pertaining to a career in public horticulture. Field trips required.

HORT 4773 Applied Landscape Planning. Lab 3. Prerequisite(s): 2233 or 2413. Concepts of landscape contracting, design and planning. Preparation of plans, and cost estimates with an emphasis on residential landscapes and use of plant materials. May be credited for students in the landscape architecture of landscape contracting programs.

HORT 4901* Horticulture in Controlled Environments Laboratory. Lab 2. Prerequisite(s): 4903 or concurrent enrollment. Hands-on experiences and virtual field trips designed to reinforce principles discussed in HORT 4903, and to develop skill sets important to successful implementation of horticultural practices in controlled environments. Offered through web-based instruction.

HORT 4903* Horticulture in Controlled Environments. Prerequisite(s): CHEM 1215 and HORT 3113. Designing, constructing, monitoring, and manipulating controlled environments for efficient horticultural production. Offered through web-based instruction.

HORT 4933 Principles of Sustainable and Organic Horticulture. Prerequisite(s): 1013. Principles and practices of sustainable, organic, and alternative horticultural management systems. Offered through web-based instruction.

HORT 4943* International Horticulture. Prerequisite(s): 1013. Overview of the horticulture industry worldwide. Export, marketing, and international trade issues in a global horticulture context. Individual country analyses of specific fruit, vegetable and ornamental crops. Offered through web-based instruction.

HORT 4953* Plant Growth and Development. Prerequisite(s): HORT 1013 and BOT 1404. Plant embryogenesis and organogenesis; growth and development of shoots and reproductive structures; plant developmental processes including shoot expansion and dormancy as influenced by temperature, light, and other environmental factors. No credit for both HORT 4953 and 5953.

HORT 4963* Horticulture Physiology. Prerequisite(s): CHEM 1215 and BIOL 1114. Physiology of horticultural plants, including water relations, respiration, photosynthesis, growth, and development. Offered through web-based instruction.

HORT 4973* Sustainable Landscape Management. Prerequisite(s): HORT 1013 or LA 1013. The ecological principles and landscape resources supporting decision-making for sustainable landscape management. Retrospects of existing development for enhanced sustainability, including equipment selection, stormwater management, use of successional landscapes, permeability, and organic methods. No credit for both HORT 4973 and 5973.

HORT 4990* Horticultural Problems. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Problems related to pomology, olericulture, nursery production, landscape architecture, or the culture, sales and arrangement of flowers.


HORT 5110* Advanced Horticultural Problems. 1-12 credits, max 20. Selected research problems in horticulture, floriculture, landscape design; nursery production, olericulture and pomology.

HORT 5133* Temperature Stress Physiology. Prerequisite(s): BIOC 3653 and BOT 3463 or HORT 4963. 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. Offered in combination with HORT 4133. No credit for both 4133 and 5133.

HORT 5233* Experimental Horticulture. Methods of conducting research with horticultural crops, including organization and plans, field plot techniques and analysis of data.

HORT 5422* Flowering and Fruiting in Horticultural Crops. Prerequisite(s): BOT 3463. Environmental, chemical and cultural factors affecting the flowering and fruiting of horticultural crops.

HORT 5433* Postharvest Physiology. Prerequisite(s): BOT 3463 and 3460. Physiological causes for post-harvest changes in horticultural crops (ripening and senescence) and the basis for certain postharvest treatments (precooling at harvest, controlled atmosphere storage, refrigeration, and packaging techniques). Commodity-specific postharvest phenomena.

HORT 5443* Basic Laboratory Experimentation. Lab 3. Principles and theory of safe laboratory practice and experimentation. Techniques for developing and optimizing plant sample acquisition, extraction and analysis procedures. Theory of operational control; laboratory instrumentation (pH measurement, solid and liquid analytical measurement, temperature measurement, spectrophotometry, HPLC, GC). Laboratory provides hands-on experience for integrated protocol development and instrument use.

HORT 5493* Athletic Field Management Prerequisite(s): HORT 3153. Principles, practices and challenges associated with natural turf-covered athletic field management; field construction, maintenance and evaluation of playing surface quality; soil physical properties influencing management and field use, construction and maintenance materials specification, and traction, hardness and ball response factors. Offered in combination with HORT 4493. No credit for both HORT 4493 and HORT 5493.

HORT 5543* Sustainable Nursery Production. Prerequisite(s): HORT 2613 and SOIL 2124. Sustainable commercial production of field and container-grown woody ornamental crops. No credit for both HORT 4543 and HORT 5543.

HORT 5593* Plant Growth and Development. Prerequisite(s): HORT 1013 and BOT 1404. Plan for student, project and credit for students in the landscape architecture of landscape contracting programs. Offered through web-based instruction.

HORT 5973* Sustainable Landscape Management. Prerequisite(s): HORT 1013 and LA 1013. The ecological principles and landscape resources supporting decision-making for sustainable landscape management. Retrospects of existing development for enhanced sustainability, including equipment selection, stormwater management, use of successional landscapes, permeability, and organic methods. No credit for both HORT 4973 and 5973.

HORT 6000* Doctoral Research and Dissertation. 1-12 credits, max 20 for crop science; max 24 for environmental science; max 30 for plant science. Research on dissertation problems required of PhD candidates in multidisciplinary programs.

Hotel and Restaurant Administration (HRAD)

HRAD 1102 Introduction to Hotels, Restaurants, and Tourism in a Global Environment. Study of hotels, restaurants, tourism and the hospitality industry from a global perspective. Emphasizes development and history, ethical issues, and professional opportunities.

HRAD 1114 Introduction to Professional Food Preparation. Lab 3. Prerequisite(s): Restricted to HRAD, NSCI and HDFS (Family and Consumer Sciences Education option) majors. Theory and technique of food preparation using a science-based approach. Includes mis en place, recipe analysis, use and selection of equipment, quality controls, and plate presentation.

HRAD 2021 Food Safety and Sanitation. Prerequisite(s): Restricted to HRAD, NSCI, and HDFS (Family and Consumer Sciences Education option) majors. Theory and technique of food safety and sanitation focused on prevention of food borne illnesses, and ensuring public health and consumer safety.

HRAD 2152 Introduction to Hospitality Accounting. Accounting principles, procedures and transactions used for the compilation of financial reports in hospitality businesses. Theory related to assets, liabilities, owners' equity, revenues and expenses and current hospitality accounting practices.

HRAD 2243 The Business of Tourism. All aspects of the tourism business including segments of global tourism, business practices, economic impact, management as well as marketing strategies and processes.

HRAD 2283 Hospitality Industry Financial Analysis. Prerequisite(s): 2152. Study of managerial accounting concepts and applications specific to the hospitality industry with an emphasis in analysis of financial reports, ratio analysis, CVP analysis, and operations budgeting.
HRAD 2533  Hospitality Information Technology. Lab 2. Prerequisite(s): Restricted to HRAD majors. Overview and practical experience in computer systems utilized in the hospitality industry including POS and PMS, databases, file structure, and productivity software. An analysis of the interaction between technology and hospitality organizational operations.

HRAD 2643  Lodging Operations. Lab 2. Prerequisite(s): 2533, restricted to HRAD majors. The organization and administration of lodging operations including front desk operations, housekeeping, laundry, sales/marketing, management and other positions common to lodging operations. Includes a laboratory experience in The Atherton Hotel at OSU.

HRAD 2665  Food Production Management. Lab 5. Prerequisite(s): 1114 and 2021 and 2553 and ServSafe Food Production Managers Certification. Planning and preparation of various foods in food service settings with an emphasis on production systems, food safety and sanitation, quality management, and customer satisfaction.

HRAD 2771  Hospitality and Tourism Industry Speakers Series. Seminars presented by distinguished hospitality or tourism industry professionals. Current issues and implications for the future of the hospitality and tourism industries.

HRAD 2900  Hospitality and Tourism Undergraduate Research. An introduction to research in hospitality and tourism including a guided research project under the direction of a faculty member.

HRAD 3120  Special Events Management. 1-3 credits, max 12. Prerequisite(s): Restricted to HRAD majors, consent of instructor. Study of special event planning, implementation and evaluation. The interaction between the staff, customer, guests, contractors, and others necessary to implement a successful special event. Additional focus on catering through restaurants, hotels, or special event facilities.

HRAD 3193  Hospitality Training Program Development. Prerequisite(s): 30 credit hours completed. Study of the design, delivery and evaluation of training programs for hospitality and tourism organizations. Needs assessment, performance objectives, instructional design, and a variety of presentation methods, organizational and individual development.

HRAD 3213  Hospitality and Tourism Management and Organizations. Prerequisite(s): 30 credit hours completed. Function and methods of management as related to the hospitality and tourism industries. Management principles, decision-making, organizations, interpersonal relationships, and production systems.

HRAD 3223 (I)  International Travel and Tourism. The study of international travel and tourism for business and pleasure. The management of travel and tourism concepts in the hospitality industry and related businesses around the world. International travel industry financial management, technology, economic planning and policy formulation.

HRAD 3411  Hospitality and Tourism Pre-Internship Seminar. Prerequisite(s): HS 1112 or 3112 (or concurrent). Preparation in written communication, resumes, interviews, securing an internship, professional behavior and ethics in the hospitality and tourism industries.

HRAD 3443  Hospitality and Tourism Industry Internship. Prerequisite(s): 2643, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418 hours of documented hospitality or tourism work experience. Supervised experience in an approved work situation related to a future career in the hospitality or tourism industry. Management and supervisory experience in multiple aspects of a hospitality or tourism organization.

HRAD 3473  Mechanical Equipment and Facility Management. Prerequisite(s): 30 credit hours completed. Fundamentals of building management, mechanical systems, maintenance and facilities management. The theory and interaction of illumination electric wiring, plumbing, heating, ventilation, air conditioning systems. Principles of facility management in the hospitality industry related to coordination of the physical space with guest services.

HRAD 3543  Lodging Property Management. Prerequisite(s): 2643. The organization, duties, and administration of hotel support departments. The various jobs in lodging housekeeping, engineering, security, and convention and meeting services. Facilities management, purchasing, and furnishing, fixtures and equipment concepts.

HRAD 3573  Franchising and Quick Service Restaurant Management. Study of the history and transformation of hospitality industry chains. The organization of chains, fundamentals of franchising, sales and growth, evaluation of franchise financial performance, and unit ownership characteristics. Quick service restaurant organization, guest services, cost controls, sanitation, personnel management, purchasing, marketing, and time management.

HRAD 3575  Service Management in Hospitality Operations. Lab 4. Prerequisite(s): 2665. Development of service management skills for the hospitality industry with an emphasis on leadership behavior, motivation; communication training, staffing and professionalism with an emphasis on food service.

HRAD 3623  Purchasing and Cost Control for Hospitality and Foodservice. Lab 2. Prerequisite(s): 2283. Theory, processes and complexities of procurement and cost controls for products and services utilized in hospitality industries. Emphasis on the management of the purchasing process, cost control systems, and technology applications.

HRAD 3643 (D, S)  Geotourism. A unique tourism destination will be examined and evaluated in depth related to the authenticity of its environment, culture, aesthetics, and heritage emphasized through specific geotourism practices.

HRAD 3663  Hotel Food and Beverage Operations. Prerequisite(s): 30 credit hours completed. Examination of the products, production techniques, presentation, and service styles of hotel food and beverage operations. Planning, producing and marketing hotel food and beverage services.

HRAD 3721  Overview of Beverages in the Hospitality Industry. Prerequisite(s): Proof of minimum age 21. Overview of the international dimensions, history, classifications, production techniques, distribution, and quality factors of beverages such as wines, distilled spirits, beers, and non-alcoholic beverages used in the hospitality industry. Responsible alcohol beverage service and management techniques.

HRAD 3783  Hospitality Industry Human Resources Management. Prerequisite(s): 30 credit hours completed. Theories and practices used for personnel management in the hospitality and services industries. The organization of a human resource department, hiring, discipline, compensation, job analysis and performance evaluation.

HRAD 4090*  International Hospitality Studies. 1-18 credits, max 18. Prerequisite(s): 45 credit hours completed. Participation in a hospitality educational experience outside of the U.S. The international aspects of the hospitality industry especially in country or countries included in the experience. Development of an understanding of local, regional and national customs and cultures through experiential learning.

HRAD 4093 (I)  European Lodging and Tourism Management. Prerequisite(s): consent of instructor. Participation in a hospitality educational experience in Europe. International aspects of the lodging and tourism industries, especially in the country or countries included in the experience. Development of an understanding of local, regional and national customs and cultures as related to lodging and tourism management and practices.

HRAD 4103*  Hospitality Law and Ethics. Prerequisite(s): 30 credit hours completed. Examination of the laws regulating the hospitality industry. The interrelationships between law, the hospitality industry, and the public. Exploration of ethics, how legal principles apply in a global environment, and fundamental principles of tort and contract law.

HRAD 4120*  Advanced Special Events Management. 1-3 credits, max 6. Prerequisite(s): Consent of instructor and restricted to HRAD majors. Hands on study of special events, forums and conferences. Planning activities include conception, planning, implementation, and evaluation of an event, forum or conference. Public relations and coordination.

HRAD 4163*  Hospitality and Tourism Marketing and Sales. Prerequisite(s): 30 credit hours completed. Strategies for marketing, sales and decision-making in the hospitality and tourism industries. Includes techniques and methods of customer identification, consumer behavior, competition, product, promotion, placement and pricing strategies as well as developing sales strategies to attract the target market.

HRAD 4193* (I)  European Cuisine and Restaurant Management. Prerequisite(s): Consent of instructor. Participation in a hospitality educational experience outside of the U.S. Introduction to the international aspects of the food and beverage industry, especially in the country or countries included in the experience. Development of an understanding of local, regional and national customs and cultures as related to culinary practices as well as food and beverage management.

HRAD 4213*  Hospitality Catering. Fundamentals of the theory, processes and operations of hospitality catering operations. Additional emphasis on the organizational structure and detailed elements of a catering business including menus, production schedules, function types, and catering contracts. Includes elements of event organization, production and evaluation.

HRAD 4263  Beverage Management and Controls. Prerequisite(s): 3575 and 3623. The theory of beverage service in the hospitality industry. Strategies to manage beverage and bar operations, control systems and profitability, product selection and marketing, facility requirements and responsible alcohol service.

HRAD 4293*  Hospitality Small Business Development. Prerequisite(s): 3543, 3575 and 3623 and 4163. The theories and procedures necessary to develop a small business in the hospitality industry. Financial analysis, feasibility study, pro-forma creation, building and site construction and brand selection.

HRAD 4333*  Hospitality and Tourism Financing. Prerequisite(s): 2283. The theory and practice of operational and strategic financial policy and problems in the hospitality industry. Financial concepts, fund allocation, asset management, financial structure and analysis of the financial environment.

HRAD 4413*  Hospitality Information Systems. Prerequisite(s): 2533, 2643 and 2665. Conceptual analysis of hospitality technology systems such as food and beverage service, housekeeping, sales, property management, personnel, accounting, front office, and inter- and intra-departmental functions. The ethical implications of technology.

HRAD 4443*  Advanced Hospitality and Tourism Industry Internship. Prerequisite(s): 3443, 75 credit hours completed, consent of instructor. Management experience in multiple aspects of a hospitality or tourism...
organization. Exploration of human resources, development of an understanding of organizational behavior, conflict resolution, negotiating and communication techniques. Application of critical thinking skills to solve problems. The interaction between the customer and the products and services provided by the organization.

HRAD 4453* Revenue Management in Hospitality Operations. Prerequisite(s): 3623 or concurrent enrollment and 3543. Focus on revenue management in hospitality organizations with specific emphasis on pricing and strategies, forecasting sales and trend analysis.

HRAD 4523* Integrated Capstone Seminar. Prerequisite(s): 3543 and 3575 and 3623 and 4163 or concurrent enroll and 90 credit hours completed. Integration of previous classroom, laboratory, and practical experiences through development of a comprehensive project. Additional focus on application of critical thinking, demonstration of leadership principles, interaction with industry professionals and development of an awareness of societal and ethical issues and their application to the hospitality and tourism industries.

HRAD 4551 Certified Hotel Industry Analytics. Prerequisite(s): HRAD 4551. Focuses on developing thorough knowledge of the foundational metrics and definitions used by the hotel industry with an opportunity to complete a certification exam (CHA) by STR through AHLEI (American Hotel and Lodging Educational Institute).

HRAD 4561* Hospitality Management Seminar. The issues having an impact on the hospitality industry. Exploration of the issues utilizing various strategies and a multi-disciplinary approach. Discussion and interpretation of multiple perspectives with an emphasis on critical thinking, strategic decision making, and the formulation of innovative solutions and processes to enhance the workplace.

HRAD 4563 Gastronomy. Prerequisite(s): 2665 or consent of instructor. An introduction and evolution of the ideas, philosophies and attitudes toward food production and the role of the chef, restaurateur and hospitality professional.

HRAD 4610 Hospitality Leadership Symposium. 1-3 credits, max 9. Case study based course focusing on leadership and innovation in the hospitality industry. Course taught in an interactive seminar format.

HRAD 4643* Applied Human Resources in Hospitality. Prerequisite(s): 3783 and concurrent enrollment in 3443 or permission of instructor. Directed learning for effective and legal employee management within hospitality industry operations utilizing strategies for job analysis, recruitment, employee involvement, measurement and organizational change to improve unit performance. Also incorporates a Certificate in Human Resource Management and Supervision.

HRAD 4723 Beverage Education. Prerequisite(s): Proof of minimum age 21. Emphasis on the international dimensions of the history, classifications, production techniques, distribution, and quality factors of beverages such as wines, distilled spirits, beers, and non-alcoholic beverages. Emphasis on responsible alcohol beverage service and management techniques.

HRAD 4833* Casino and Gaming Management. Prerequisite(s): 2152 and 2283. Focus on the management of casino and gaming operations including the history and trends of gaming, current legal issues, current environmental influences and social consequences of casino, lottery and pari-mutual segments. Also theory and practice in the analysis of gaming operations in the areas of casino management, marketing, accounting/controls, security, human resources and law.

HRAD 4850* Special Unit Course in Hotel and Restaurant Administration. 1-15 credits, max 15. Prerequisite(s): Consent of instructor. Special unit of study related to specific problems in the hospitality industry.

HRAD 4900 Honors Creative Component. 1-3 credits, max 3. Prerequisite(s): College of Human Sciences Honors Program participation, senior standing. Guided creative component for students completing requirements for College Honors in the College of Human Sciences. Thesis, creative project or report under the direction of a faculty member in the major area, with second faculty reader and oral exam.

HRAD 4983* Conference and Meeting Planning. Prerequisite(s): 2643, 2665, and 2283 or consent of instructor. Planning and implementing conferences, teleconferences, conventions, special events, seminars and symposia. Designing, promoting, managing and evaluating educational events, and contract management.

HRAD 5000* Master’s Thesis. 1-6 credits, max 6. Prerequisite(s): Graduate standing and consent of advisor. Individual research interests in hospitality administration fulfilling the requirements for the MS degree.

HRAD 5030* Master’s Creative Component and Independent Study. 1-3 credits, max 3. Prerequisite(s): Graduate standing and consent of instructor. Individual research and study having relevance to the hospitality field and a positive impact on the hospitality industry.

HRAD 5111* Hospitality and Tourism Graduate Studies and Research. Prerequisite(s): Master’s degree students only or consent of instructor. Systematic introduction to the competencies of graduate education and research in hospitality and tourism education and administration.

HRAD 5213* Hospitality and Tourism Management. In-depth study of hospitality and tourism management including theory, research, operations and practical experience. Emphasis on lodging operations systems, commercial food service systems, and tourism. Analysis and synthesis of a comprehensive management philosophy consistent with theory.

HRAD 5233 Convention and Special Event Management. Meeting and event design, working with industry suppliers, on-site management, post-event analysis, computers and technology, and meetings documentation.

HRAD 5243* Retailing and Franchising in the Hospitality Industry. Entrepreneurial perspective of growth and performance of commercial and non-commercial food service and health care organizations. Challenges relative to operations management, convenience stores, quick service operations, procurement, price analysis, communication, efficient customer response, capital and human resources, competition, governmental influence, and decision-making process.

HRAD 5253* Critical Issues in Gaming. Focuses on current issues, advanced research and the theoretical constructs of the gaming industry and includes exploration of current issues, cultural influences and social consequences of casino, lottery, racing and pari-mutual segments. Students will also gain theoretical knowledge and learn to apply research skills in the analysis of gaming operations in the areas of casino management, marketing, accounting/controls, security, human resources and law.

HRAD 5262* Seminar in Contemporary Hospitality Administration. Principles, theories, and methods of hospitality management applied to various types of hospitality organizations. Hospitality Administration topics of finance, human resources, marketing, technology, education and management. Supervised readings of current literature not included in regularly scheduled courses. Course taught in an interactive seminar format.

HRAD 5313* Hospitality and Tourism Information Technology. Conceptual analysis of the technology used in the hospitality industry. Investigation of technology applications, ethical implications of technology and system development practice.

HRAD 5323* Hospitality Accounting and Finance. Understanding the role of the accounting and financial function in hospitality firms. Learn how to read hospitality financial statements and develop analytic concepts as management tools to examine the profitability of hospitality firms and to make superior capital investment decisions, and to become familiar with major financial instruments and concepts.

HRAD 5333* Hospitality Business Analysis. Fundamental understanding of the logic and structure of business plan, and knowledge of concepts for analyzing hospitality businesses. Examination of the application of hospitality management concepts and principles within hospitality organizations, assessment of factors contributing to a company’s business orientation.

HRAD 5413* Employee Development Issues in the Hospitality and Tourism Industries. Recent theories and research in human resource management, employee development, and labor issues affecting the hospitality and tourism industry in maintaining a productive workforce.

HRAD 5423* Hospitality Customer Development Strategies. Prerequisite(s): Undergraduate marketing course. The concepts and strategies of hospitality and tourism marketing and development.

HRAD 5513* Hospitality Corporate Strategy. Focus on strategic decisions in hospitality businesses, and with both the content of those decisions and the processes by which managers position the businesses and strategically allocate resources to maximize its economic value under conditions of uncertain, dynamic, and competitive environments.

HRAD 5613* Service Quality in Hospitality and Tourism Management. Study of contemporary management principles in the hospitality industry. Service improvement and customer satisfaction in the hospitality industry through the use of total quality management. How service industries such as hospitality can use business techniques such as continuous improvement, employee involvement, measurement and organizational change to improve unit operations.

HRAD 5813* Research Methods in Hospitality and Tourism Administration. Prerequisite(s): REMS 5953 or STAT 5013. Scientific methods and research as applied to problems in hospitality and tourism administration. Proposal planning, research design, statistical use and interpretation, and research reporting.

HRAD 5850* Special Topics in the Hospitality Industry. 1-3 credits, max 9. Special topics related to the hospitality industry. A problem-solving technique to design the research model and investigative procedures. Presentations to faculty, students and industry professionals at specialized workshops with research, instructional and industry project components.

HRAD 5870* Problems in the Hospitality Industry. 1-3 credits, max 9. Special recurring problems in the hospitality industry. Broad perspective of the issues and their application to the industry. Critical thinking skills to solve operational dilemmas.

HRAD 5992* Hospitality and Tourism Research Seminar I. Prerequisite(s): 5813 and Master’s degree students only or consent of instructor. Review and critique hospitality and tourism research articles. Address the problems encountered in communicating and presenting hospitality and tourism research papers.

HRAD 6000* Doctoral Dissertation. 1-12 credits, max 30. Prerequisite(s):
Consent of major professor. Research in hospitality administration for the PhD degree.

HRA D 611* Hospitality and Tourism Doctoral Studies and Research. Prerequisite(s): Doctoral degree students only or consent of instructor. Systematic introduction to the competencies of graduate education and research in hospitality and tourism education and administration for doctoral students.

HRA D 611* Hospitality and Tourism Education. Prerequisite(s): Doctoral degree students only or consent of instructor. Theoretical and practical components of hospitality and tourism education with emphasis on universities, community colleges and vocational schools.


HRA D 631* Tourism Policy and Planning. Examination of current international and national tourism policies, planning and development perspectives and the economic impact.

HRA D 641* Leadership in a Diverse Society. Comparing and critiquing leadership and diversity research, theories and practices society. Development of models for future professional practice that integrate leadership and diversity principles.


HRA D 661* Advanced Research Methodology in Hospitality and Tourism. Advanced research methodologies in hospitality and tourism. Essential concepts in contemporary research, examination of multivariate data analysis techniques in hospitality and tourism research. Development of individual research projects.

HRA D 660* Seminar in Food Service Management. 1-3 credits, max. 9. Examination of research, practice, and future trends in food service management issues from a strategic perspective.

HRA D 671* Contemporary Hospitality and Tourism Theory. Prerequisite(s): Doctoral degree students only or consent of instructor. Advanced survey of the classic and current body of knowledge in the area of hospitality and tourism management. Introduction to important works in the research area of hospitality and tourism management that will prepare students to assess fundamental research questions, opportunities, and limitations of the research.


HRA D 6880* Seminar in Travel and Tourism Management. 1-3 credits, max. 9. Study of the latest developments in travel and tourism research and management.

HRA D 699* Advanced Hospitality and Tourism Research. Prerequisite(s): Graduate level basic and/or intermediate research methods and intermediate statistics and doctoral degree student or consent of instructor. The latest advances in hospitality and tourism research theory development, modeling and research design. Focus is on improving ability to effectively develop build a conceptual framework/model with an appropriate research design and hypotheses.

Human Development and Family Science (HDFS)

HDFS 1101 Relationships 101. An applied course designed to actively involved students in the exploration of topics which influence the development of positive relationships. Topics include gender differences, relationship principles, family of origin and personal needs. Application to personal and professional settings.

HDFS 1112 Introduction to Human Development and Family Science. Exploration of the philosophy of human development and family science including topics related to academic achievement, risk and resilience, careers in HDFS, and specific fields of study within HDFS.

HDFS 2113 (S) Lifespan Human Development. Study of human development within diverse family systems. Taught from a life span perspective.

HDFS 2114 Lifespan Human Development: Honors. Prerequisite(s): Honors students only. Honors course critically examining the study of human development within diverse family systems. Taught from a lifespan perspective.

HDFS 2123 (D) Developmental Disabilities: Issues Across the Lifespan. Prerequisite(s): 2113. The intersection of biological and environmental influences on patterns of atypical development across the lifespan. Assumes a basic knowledge of cultural diversity and research methods employed in human development. Directed observation of persons with developmental disabilities.

HDFS 2211 Early Childhood Field Experience I. Prerequisite(s): concurrent enrollment in 2233 and 2243; Full admission to Professional Education. Clinical experience working with children ages birth through 5, including observation of children in classroom contexts and design and teaching of creative activities with groups of students.

HDFS 2213 Human Sexuality and the Family. Sexual development emphasizing personal adjustment and interaction with family and culture.


HDFS 2223 Development of Creative Expression, Play and Motor Skills in Early Childhood. Prerequisite(s): For ECE students: concurrent enrollment in HDFS 2211 and HDFS 2243 and full admission to Professional Education. For Non-ECE students: HDFS 2113 and consent of instructor. Consideration of appropriate experiences in the areas of play, art, music and motor skills for young children from birth through eight years of age with an emphasis upon such experiences as a curricular base in early educational group settings. Observation and participation experiences with young children.

HDFS 2243 Infant-Toddler Programming. Prerequisite(s): For ECE students: concurrent enrollment in HDFS 2211 and HDFS 2233 and full admission to Professional Education. For Non-ECE students: HDFS 2113 and consent of instructor. Program planning, implementation and evaluation of developmentally appropriate programs for infants and toddlers. Directed observation and participation in infant and toddler programs.

HDFS 2433 (S) Relationship Development and Marriage. Theory and research on the formation of interpersonal relationships from dating through courtship and marriage.

HDFS 2453 Management of Human Service Programs. Prerequisite(s): 1112 and 2113. Development of professional skills for the human services. Intakes, interviewing, assessment, reporting, program marketing, case management, advocacy, facilitating change, community collaboration and using databases.

HDFS 2850 Special Unit Courses in HDFS. 1-6 credits, max. 6. Various units taught by specialists in Human Development and Family Science.

HDFS 3021 Topics in Early Childhood Education. Current selected problems or topics in early childhood education which influence individual and family risk and resiliency, including NCLB, current legislative issues, policy issues and other topics that are of interest and importance to students enrolled during the semester.

HDFS 3023 Child Development - Birth to 3. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Major theories and research on development from birth to age 3 including growth patterns, influences of disabilities and risk factors, environmental factors and their effects on attachment styles, language acquisition, brain development, cognitive development, social-emotional development, and perceptual and sensory motor skills. Web-based instruction.

HDFS 3024 Literacy Assessment and Instruction in Early Childhood Education. Prerequisite(s): Concurrent enrollment in 3023, 4363, 4323 and 4313 and full admission to Professional Education. Developmentally appropriate assessment and instructional practices to meet language and literacy needs of children, age birth to 6 years. Based on a constructivist framework, formal and informal assessment of children is discussed. Assessments consistent with SBRR, NAEYC and IRA guidelines, with a focus on performance, observation, and interviews will address literacy needs of diverse learners in the context of an EC classroom practicum.

HDFS 3033 Child Development - 4 to 8. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Physical, cognitive, social/emotional and personality growth and development during early childhood. Major theories of development and current research and ideas in conjunction with historical approaches to examining growth and development in ages 4-8. Web-based instruction.

HDFS 3043 Professional Development for Early Childhood Educators. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. The role of a professional as a teacher, administrator or advocate in early childhood programming. Professionalism and effective teaching strategies and applying universal precautions. Discussion of qualities of the early childhood educator role, program models, and working with children and professional colleagues. Web-based instruction.

HDFS 3053 Child Guidance and Classroom Environments. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Developmentally appropriate practice in child development. High review of current guidance methods and programs to familiarize students with successful guidance techniques. Students will develop their own approach to guidance based upon practices best suited to their own unique skills and strengths. Web-based instruction.

HDFS 3063 Health, Safety and Nutrition. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Planning, promoting and maintaining healthy and safe learning/care environments, understanding childhood illnesses and establishing healthy lifestyles, first aid, and maintaining care provider’s own health. Maintaining safe relationships with others, including identifying and reporting abuse, neglect,
and exploitation of children. Exploration of nutrients for life and feeding, food preparation and safety policies and guidelines, food allergies and intolerances, appropriate feeding practices. Web-based instruction.

HDFS 3103 Social Development and Social Studies in Early Childhood. Prerequisite(s): Concurrent enrollment in 3213, 3223, 3233 and 3202; full admission to Professional Education. Developmentally appropriate social studies curriculum and instruction for young children; content selection, lesson planning, teaching methods, materials and evaluation strategies.

HDFS 3123 (S) Parenting. Prerequisite(s): 2113 or other life-span development course. Examination of the fundamental issues and special topics in parent child relationships across the life span. Current theory and empirical research in multiple contexts of family, school and community.

HDFS 3202 Early Childhood Field Experience II. Prerequisite(s): Concurrent enrollment in 3103, 3213, 3223; 3233; full admission to Professional Education. Field experiences in classroom setting working with children in PreK through 3rd grade. Reflective practice making the most incorporates the major content area concepts and skills involved in organizing, planning, and developing instruction in early childhood classrooms.

HDFS 3203 (I) Children’s Play: A World Perspective. An examination of children's play in contemporary international cultures. Play in children from birth through late childhood will be reviewed; social and cognitive outcomes will be analyzed as related to complex, modern world systems.

HDFS 3213 Literacy Development in Early Childhood Education. Prerequisite(s): Concurrent enrollment in 3103, 3202, 3223 and 3233 and full admission to Professional Education. Theoretical and research based rationale for an integrated language arts and an interdisciplinary approach to literacy development as it addresses writing, reading and oral language for infants through age eight. Use of children’s literature.

HDFS 3223 Mathematics and Science in Early Childhood. Prerequisite(s): Concurrent enrollment in 3103, 3213, 3233, and 3202; full admission to Professional Education. Mathematics and science curricula, instructional practices, and assessment techniques for young children. Content selection and organization, lesson planning, teaching and assessment materials.

HDFS 3233 Classroom Management in Programs for Young Children. Prerequisite(s): Concurrent enrollment in 3103, 3202, 3223, and 3202; and full admission to Professional Education. Effective guidance practices in group settings (PreK-3) based upon the application of theoretical models. Various guidance strategies will be examined. Relevant theories, influential research and developmentally appropriate guidance techniques that facilitate the development of pro-social behaviors.

HDFS 3263 Curriculum Development for Children Ages Birth to 3. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3023, 3033, 3043, 3053, 3063. Learn and utilize assessment and documentation to inform curriculum, plan and evaluate developmentally appropriate activities, and learn effective ways to share curriculum information with families for children ages 0-3. Developmental domains and content areas; issues related to diversity in family composition, culture, and individual abilities will also be addressed. Web-based instruction.

HDFS 3273 Curriculum Development for Children Ages 4-8. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3023, 3033, 3043. Learn and utilize assessment and documentation to inform curriculum, plan and evaluate developmentally appropriate activities, and learn effective ways to share curriculum information with families for children ages 4-8. Developmental domains and content areas; issues related to diversity in family composition, culture, and individual abilities will also be addressed. Web-based instruction.

HDFS 3283 Assessing Young Children and their Environments to Enhance Development. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3023, 3033, 3043, 3053, 3063. Select, evaluate, and use appropriate assessment tools for children birth to age 8 using assessment data to inform decisions about teaching (environments and practice) and intervention. Observations on the ethical assessment, valid assessments, multicultural sensitivity, and assessments for children with special needs. Web-based instruction.

HDFS 3293 Understanding and Adapting for Developmental Differences. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3023, 3033, 3043, 3053. Knowledge of disability conditions, assessment and identification, interventions in inclusive environments, and collaborations among family members and service providers. Web-based instruction.

HDFS 3303 Administration and Supervision in Early Childhood Settings. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Exploration of issues surrounding the administration of early childhood programs including identification of community needs, analysis of business opportunities, evaluation and appropriate use of cost management, and quality program policy and legal responsibilities, and professionalism in the field. Best practices in staff selection, training, coaching and supervision. Web based instruction.

HDFS 3313 Technology and Young Children. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Electronic technology’s impact on the development of young children in educational, home, and community environments and how it can be used in early childhood classrooms to enhance teaching and learning. Students will be critical thinkers and informed consumers of technology related to young children. Web-based instruction.

HDFS 3323 Diversity in the Lives of Young Children and Families. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program; SOC 1113; PSYC 1113; and HDFS 2113 or equivalents. Exploration of cultural diversity in daily life and beliefs farm and with young children. The focus is on U.S. families, with attention to the multiple cultures from which they come. Web-based instruction.

HDFS 3333 Working with Families. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 2113. Application of an ecological model to the understanding of variation in parent roles, perspectives, relationships, approaches, and challenges. Web-based instruction.

HDFS 3413 Infant and Child Development. Prerequisite(s): 2113. Examination of continuity and change in physical, cognitive/language, and socioemotional development from the prenatal period through early middle childhood (age nine). Diverse contexts, directed observation of infants and children.

HDFS 3423 (S) Adolescent Development in Family Contexts. Prerequisite(s): 2113. Development of the adolescent physically, socially, intellectually and emotionally with emphasis on the search for identity, sexuality, vocational choices and interpersonal relations. Observational and interview methods.

HDFS 3443 Family Dynamics. Prerequisite(s): 2113. Applying family theories and current research to the examination of dynamics of diverse families across the life course and within the social context.

HDFS 3513 Research Methods in Human Development and Family Science. Prerequisite(s): STAT 2013 or STAT 2023 or STAT 2053 and ENGL 3323. Examination of fundamentals of scientific methodology as applied to research in human development and family science. Research design, sampling and measurement. Analytical, evaluative, and interpretive skills needed to understand the professional research literature. Application of statistical analysis to research in human development and family science.

HDFS 3603 Foundations and Philosophies of Family and Consumer Sciences Education. Prerequisite(s): HDFS FACS major and 15 hours completed from major requirement courses. Historical and contemporary influences on the development and mission of Family and Consumer Sciences Education. Emphasis on the professional roles and responsibilities of FACSED in Cooperative Extension Service and public schools.

HDFS 3623 Field Experiences in Family and Consumer Sciences Education. Prerequisite(s): HDFS 3603. Supervised Family and Consumer Sciences Education field experiences specific to Cooperative Extension Service and public schools. A minimum of 60 observation hours are required.

HDFS 4000 Senior Thesis. 1-5 credits. max 6. Prerequisite(s): 4743, STAT 2013, senior standing, consent of instructor. Supervised research for the bachelor's degree.

HDFS 4013 Practicum I in Early Childhood. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3023, 3033, 3043, 3053. 3-6 credits. Guided learning experience in a professional agency that provides services to children and families. Learning experiences and projects will provide teacher candidates the opportunity to utilize and implement theories and practices learned in other ECE classes. Web-based instruction.

HDFS 4023 Practicum II in Early Childhood. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3023, 3033, 3043, 3053, 3063, 4013. Guided learning experience in a professional agency that provides services to children and families. Learning experiences and projects will provide teacher candidates the opportunity to utilize and implement theories and practices learned in other ECE classes. Web-based instruction.

HDFS 4033 Practicum III in Early Childhood. Prerequisite(s): Admission to Great Plains IDEA Early Childhood Non-certification program and HDFS 3273, 3283, 3293, 3303, 3313, 3323, 3333, and 4013. 15 week experience of practical application of developmentally appropriate early childhood teaching techniques and skills, actual teaching experience and developmental feedback. Observation and evaluation of classroom experiences, environmental design, classroom management, and parent communication. Web-based instruction.

HDFS 4313 Early Childhood Field Experience III. Prerequisite(s): Concurrent enrollment in 2123, 3024, 4363, 4323; full admission to Professional Education. Field experience in pre-kindergarten settings through third grade. Develop philosophical perspectives of teaching, consider effective parent-teacher relations, and connect with the wider community as a resource context for teaching and learning. Plan and teach an integrated, thematic curriculum unit for prekindergarten through grade three as part of the field component. Graded on a pass-fail basis.

HDFS 4323 Family, School and Community. Concurrent enrollment in 2123, 3024, 4363, and 4313; Full admission to Professional Education. Examination of theories of families and their relationships with schools and communities and the implications for early childhood practices.
The field of Marriage and Family Therapy (MFT). Includes theoretical foundations of the disciplines as well as assignments that demonstrate the application of the theories in a family therapy session.

HDFS 4713 Family Resource Management. Examination of individual and family management of interpersonal, financial, workplace, social, and community resources over the lifespan. Includes an emphasis on decision making within the family system, particularly regarding families with issues that affect timing and balancing of resource management.

HDFS 4750 Topics in HDFS. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Various units of work related to specific issues in Human Development and Family Science.

HDFS 4793 (I,S) The Family: A World Perspective. Family structure and interaction that transcend specific cultures or nationalities; examination of specific cultural and international family forms, their social issues and relevant services to meet their needs.

HDFS 4813 Dying, Death and Bereavement. Physical, psychological, emotional and social aspects to dying and death across the life course. Examination of human experiences with and responses to dying and death within various contexts such as family, medical and cultural.


HDFS 4850 Special Courses in Human Development and Family Science. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Various courses related to specific issues in Human Development and Family Science.

HDFS 4900 Honors Creative Component. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Band studies. Creative component for students completing requirements for College Honors in College of Human Sciences. Thesis, creative project or report under the direction of a faculty member in the major area, with second faculty reader and oral exam.


HDFS 4950 Research Practicum in HDFS. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Hands-on research experience under the direction of faculty members in various human development and family science topics. Graded pass/fail.

HDFS 5000* Master’s Thesis. 1-6 credits, max 6. Research in HDFS for MS degree.

HDFS 5110* Directed Study in HDFS. 1-9 credits, max 9. Prerequisite(s): 5253, 5293, 5513 or 5523 and consent of instructor. Directed individual study in human development and family science.

HDFS 5112* Computer Applications in HDFS Research. Creating variable codebooks, data coding, data entry, variable specifications and data manipulation, merging files, and basic analysis using SPSS software. No computer experience necessary.

HDFS 5133* Research Methods in Human Development and Family Science. Prerequisite(s): HDFS 5173. Research processes, design, and methods in human development and family science. Application of research tools and methods to investigate theoretical, empirically-based, or field-based research issues with a focus on individual and family risk and resilience. Development of a research proposal and application of statistical analyses.

HDFS 5153* Policy in Human Development and Family Science. Critical analysis of approaches to and models of policy in Human Development and Family Science. Examination of policy analysis and evaluation, development, advocacy, and implementation of state and federal policy and legislation.

HDFS 5160* Master’s Creative Component. 1-6 credits, max 6. Prerequisite(s): 5253, 5293, 5513 or 5523 or equivalent and consent of instructor. Creative application of student’s knowledge to solve a problem of interest in HDFS.

HDFS 5163* Creative Component in HDFS: Development and Application. Prerequisite(s): 5133 and 5290. Development and implementation of a creative component project related to an area of human development and family science. Interfaces with practicum experience and involves the integration of theory, research, and application.

HDFS 5173* Program Design, Implementation, and Evaluation in Human Development and Family Science. Prerequisite(s): Online Section Prerequisite: Admission to the HDFS Family and Community Services GPIDEA Graduate Program; Campus-based Section Prerequisite: Admission to the HDFS Graduate Program or consent of instructor. An exploration of the principles and methods of program design, implementation, and outcome evaluation of family and community programs.

HDFS 5183* Practicum in Developmental and Family Sciences Research. Prerequisite(s): Admission to graduate study in HDFS, nine hours of graduate credit in HDFS, and consent of instructor. Supervised research experiences in human development and family sciences.
HDFS 5190* Teaching Practicum. 1-3 credits, max 3. Prerequisite(s): Six hours of graduate course work and consent of instructor. Teaching human development and family sciences; content and techniques.


HDFS 5203* Family Systems. Research and theory related to family functioning throughout the life cycle, especially financial decision making during crisis and conflict. Factors that shape family values, attitudes and behaviors from a multicultural perspective. New and emerging issues critical to family functioning.

HDFS 5213* Lifespan Development. Prerequisite(s): Online Section Prerequisite: Admission to the HDFS Family and Community Services GPIDEA Graduate Program; Campus-based Section Prerequisite: Admission to the HDFS Graduate Program or consent of instructor. An examination of human development including the cognitive, both a lifespan and a bio-ecological perspective.

HDFS 5223* Resilience in Individuals and Families. Prerequisite(s): Admission to the HDFS GPIDEA Graduate Program. Exploration of resilience approaches to the study of families and human development across the life cycle. Web-based instruction.

HDFS 5233* Infant Mental Health. Foundations of infant mental health theory, research, and practice. Includes the familial context of children’s early development and the importance of infant-caregiver relationships, early intervention, assessment, and reflective practice. Emphasis is placed on the application of early infant mental health principles across settings and disciplines focused on early childhood and families.

HDFS 5243* Infant and Early Childhood Development and Attachment. Survey of research and theory pertaining to infant and early childhood development and attachment. Content includes cognition and learning, social and emotional development, and assessment. An emphasis is placed on attachment and implications for practitioners working with young children and families.

HDFS 5253* Theory and Research: Social and Emotional Development. Research and theory pertaining to social and emotional development, including attachment and family context, social interaction, friendships and temperament. Incorporates applications to policy and practice.

HDFS 5263* Theory and Research: Cognitive and Language Development. Research and theory pertaining to cognitive and language development including environmental influences and family influences, attention and memory, problem solving, and social cognition. Incorporates applications to policy and practice.

HDFS 5273* Parent Education. Prerequisite(s): Consent of instructor. Parent-child relations, parenting strategies, and other major components of empirically validated parent education programs that lead to certification. Supervised practice.

HDFS 5283* Developmental Disabilities. Recent policies, practice, theory, and research related to individuals with developmental disabilities and their family members.

HDFS 5290* Practicum. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Supervised experience in various settings relevant to human development and family sciences.

HDFS 5293* Developmental Contexts ofNormative Behavior Problems. Examines the theory and research regarding biological, developmental and contextual factors associated with normative behavior problems. Contexts include families, neighborhoods, peers and schools. A lifespan perspective examining the origins and course of individual patterns of maladaptation, such as aggression, delinquency, social withdrawal, anxiety and depression. Addresses prevention of and intervention with normative adjustment difficulties.


HDFS 5333* Early Childhood Education History and Theory. The history of early childhood education and the theoretical approaches for planning educational programs and learning experiences for young children.

HDFS 5343* Developmental Assessment and Interventions. Applications of qualitative and quantitative approaches to observation and developmental assessment and intervention strategies for students preparing to become specialists or practitioners working with children and families, including early childhood education, child and parenting practitioners, and human service practitioners.

HDFS 5353* Diversity in Early Childhood. Exploration and critical review of the state of early childhood programming with emphasis on research, theory, and policy making that bear on current diversity and multicultural issues in practice.

HDFS 5363* Early Childhood Development and Education. The interaction of biology, family, culture, and extended environment on children’s emotional, social, and cognitive development during the early childhood years. The implications of regularities and diversity in development for teaching and learning and on principles of educational practice to enhance development.

HDFS 5373* Early Childhood Administration. Examination of the administration, management, and supervision of programs for young children. Legal, social, and economic conditions affecting programs.

HDFS 5400* Professional Seminar in Gerontology. 3 credits, max 3. An integrative experience for gerontology students designed to be taken near the end of the degree program. By applying knowledge gained in earlier coursework, students strengthen skills in ethical decision-making and behavior, applying these skills in gerontology-related areas such as advocacy, professionalism, family and workplace issues. Students from a variety of professions bring their unique perspectives to bear on topics of common interest. Web-based instruction.

HDFS 5403* Perspectives in Gerontology. An overview of current aging issues including current focus of gerontology theory and research; critical social and political issues in aging, the interdisciplinary focus of gerontology; current career opportunities, and aging in the future. Web-based instruction.

HDFS 5411* Ethics and Aging. Analysis of ethical issues for the aging population. Critical examination of various ethical issues from legal, psychological, social, and financial perspectives. Enrollment requires attendance of the one-day, Oklahoma Ethics and Aging Conference.

HDFS 5413* Adult Development and Aging. The biological, psychological and social factors associated with aging. Special emphasis on developmental adaptation in late and very late life.

HDFS 5423* Research Perspectives in Gerontology. Critical review of gerontological literature. Special emphasis on current knowledge related to research methodologies, measurement applications, and clinical interventions used to study age-related processes and outcomes.

HDFS 5433* Theories of Aging. Addresses the historical, contemporary and interdisciplinary basis of aging theory. Biological, psychological, sociological and human developmental conceptualizations of aging are critically assessed. Emphasis is placed on conceptual models, as well as theoretical development and application within gerontological research and the field of aging.

HDFS 5443* Interpersonal Relationships. Prerequisite(s): Admission to the HDFS GPIDEA Graduate Program. An examination of interpersonal relationships in context, including theoretical perspectives, research methods, relationship forms, and relationship processes. Web-based instruction.

HDFS 5453* Aging in the Medical Context. Orients students to the unique issues related to health and the health system for individuals in later life. A particular focus is placed on health programs, the role of medical personnel and tasks of family members as older persons face health issues and decisions.

HDFS 5470* Developments and Innovations in Human Development, Family Science, and Early Childhood Education. 1-3 credits, max 3. 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.

HDFS 5483* Aging Network Seminar. Personal, academic, and professional development in preparation for a career in the aging service network. Primary focus on networking with applied aging researchers and aging service providers.

HDFS 5493* Aging and Families. Theories and research related to individual and family adjustments in later life affecting older persons and their intergenerational relationships. Critical issues include marriage, divorce and remarriage, adult children and their parents, grandparenting, and alternative family forms.

HDFS 5513* Issues in Family Science. Current and classic literature in family science. Consideration of philosophical bases and current research issues relevant to the family as a field of study.

HDFS 5523* Family Theory. Theoretical frameworks and processes in family science. Overview of the interface between theory, research, and application in family science.

HDFS 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.

HDFS 5553* Perspectives on Parenting and Parent Education. Prerequisite(s): Admission to the HDFS GPIDEA Graduate Program. An examination of theories, models, methods, research, and skills related to parenting and parent education. Web-based instruction.

HDFS 5563* Community and Family. Prerequisite(s): Admission to the HDFS GPIDEA Graduate Program. Examination of current research and theory in the interactions of families and communities. Emphasis on empirical strategies for intervention to address community and family-based problems.

HDFS 5573* Adolescent in Family Context. Physical, social, emotional and intellectual development of adolescents within the context of family relationships. Exploration of research and theory as it relates to adolescent development and parent-adolescent relationships.

HDFS 5583* Human Sexuality. Multiple aspects of human sexuality including physiological and psychosexual development and response, sexual relationships, and sexual dysfunction.

HDFS 5603* Pre-Practicum in Marriage and Family Therapy: Counseling Skills. Prerequisite(s): Admission to the marriage and family therapy program.
specialization and consent of instructor. Pre-clinical experience for students in the marriage and family therapy (MFT) specialization, emphasizing counseling skills and structured observations.

HDFS 5613* Pre-Pacticum in Marriage and Family Therapy: Group Processes. Prerequisite(s): Admission to marriage and family therapy specialization and consent of instructor. Pre-clinical experience for students in the marriage and family therapy specialization emphasizing group processes, designing and running therapy groups.

HDFS 5614* Theoretical Models of Marriage and Family Therapy. An introduction to the historical context of marriage and family therapy. An overview of the major schools of marriage and family therapy and emerging models.

HDFS 5623* Systems Theory and Applications to the Family. Examination of the cybernetic roots and terminology used with general systems theory providing an understanding, appreciation and integration of the role of “systems” approaches to family theory and clinical practice.

HDFS 5633* Couples Treatment in Marriage and Family Therapy. Prerequisite(s): Graduate standing or consent of instructor. Focus on assessment of couples and the systemic interventions available to address common couple issues. Pre-marriage, divorce and remarriage, sexuality, domestic violence, infidelity, and gender.

HDFS 5643* Child and Adolescent Treatment in Marriage and Family Therapy. Prerequisite(s): Graduate standing or consent of instructor. An overview of the issues surrounding children and adolescents in marriage and family therapy including child abuse and neglect, drug abuse, oppositional behaviors, ADHD, and family structures and hierarchies. Assessment and treatment methods. Strategies for engaging families.

HDFS 5653* Systemic Approaches to Psychopathology and Psychopharmacology. Prerequisite(s): Graduate standing or consent of instructor. Overview of major mental disorders and other conditions that maybe the focus of clinical mental health treatment. Treatment issues and an introduction to psychopharmacology.

HDFS 5663* Professionalism and Ethics in Marriage and Family Therapy. Prerequisite(s): 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.

HDFS 5673* Family Dynamics of Addiction. Prerequisite(s): Graduate standing and consent of instructor. An examination of the theory and research related to addictive behaviors and couple and family relationships, and an exploration of the techniques and strategies of relational intervention for addiction.

HDFS 5690* Marriage and Family Therapy Practicum. 1-3 credits, max 18. Prerequisite(s): Admission to the marriage and family therapy program and consent of instructor. Supervised clinical experience for students in the marriage and family therapy specialization.

HDFS 5693* Child Treatment Practicum in Marriage and Family Therapy. Prerequisite(s): Admission to the marriage and family therapy program and consent of instructor. Supervised clinical experience focusing on the treatment of children within a family context.

HDFS 5713* Individual and Family Resource Management. Survey course of personal finance and family resource management literature to provide an overview of how individuals and families develop and exercise their capacity to obtain and manage resources to meet life needs. Resources include the self, other people, time, money, energy, material assets, space, and environment. Web-based instruction.


HDFS 5753* Leadership and Management of Community Service Programs. Prerequisite(s): Admission to the HDFS GPIDEA Graduate Program. An examination of leadership and management concepts related to the effective administration of community-based agencies. Web-based instruction.

HDFS 5813* Practicum in Human Development and Family Science. Prerequisite(s): Admission to graduate study in HDFS. 9 hours of graduate credit in HDFS, and consent of instructor. Supervised experiences in child development, family services or health-related settings.

HDFS 5823* History and Philosophy of Family and Consumer Sciences Education. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Historical, philosophical, and legislative bases of Family and Consumer Sciences Education in Cooperative Extension Service, public schools, and higher education. Web-based instruction.

HDFS 5833* Occupational Programs in Family and Consumer Sciences. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Planning and implementing occupational family and Consumer Sciences programs and courses. Web-based instruction.

HDFS 5843* Reading in the Content Areas of Family and Consumer Sciences Education. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Incorporating reading skills in Family and Consumer Sciences Cooperative Extension Service, public school, and higher education settings. Web-based instruction.

HDFS 5853* Adolescent Learners in Family and Consumer Sciences Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Exploration of adolescent cognitive, physical, social and emotional characteristics, with application to providing group and individual learning experiences. Web-based Instruction.

HDFS 5863* Exceptional Learners in Family and Consumer Sciences Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Strategies for working with youth, adolescent, and adult exceptional learners in Cooperative Extension Service, public schools, and higher education settings. Web-based Instruction.

HDFS 5873* Technology in Family and Consumer Sciences Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Incorporation of technology applications in Family and Consumer Sciences Cooperative Extension Service, public school, and higher education settings. Web-based Instruction.

HDFS 5883* Family and Consumer Sciences in a Pluralistic Society: Foundations and Issues. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Discussion of contemporary issues within the context of multicultural influences and cultural diversity in Cooperative Extension Service, public school, and higher education settings. Web-based Instruction.

HDFS 5913* Foundations and Principles of Family and Community Services. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Introduction to the field of family science and related professions that involve working with individuals and families in communities. Web-based instruction.

HDFS 5923* Dynamics of Family Interaction. Prerequisite(s): Admission to the Great Plains IDEA Graduate Program. An examination of theories of family function and dysfunction, techniques of assessment, and models of family intervention. Web-based instruction.

HDFS 5943* Development of Instructional Materials for Family and Consumer Sciences Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Development of individual and group materials for youth, adolescent, and adult Family and Consumer Sciences programs in Cooperative Extension Service, public school, and higher education settings. Web-based Instruction.

HDFS 5953* Research Experience in Family and Consumer Sciences. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Development of a research project related to Family and Consumer Sciences in a Cooperative Extension Service, public school, or higher education setting. Web-based Instruction.

HDFS 5963* Evaluation and Assessment in Family and Consumer Sciences Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Procedures for appraisal of individual growth and achievement in all subject areas in Family and Consumer Sciences Education for Cooperative Extension Service, public school, and higher education settings. Development of evaluative instruments for cognitive, affective, and psychomotor learning. Techniques for interpreting data. Web-based Instruction.

HDFS 5973* Administration of Family and Consumer Sciences Education Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Emphasis on educational leadership and related issues in Cooperative Extension Service, public school, and higher education settings. Web-based Instruction.

HDFS 5983* Techniques of Supervision in Family and Consumer Sciences Programs. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Philosophy, responsibilities, and techniques for supervising in Family and Consumer Sciences Cooperative Extension Service, public school and higher education settings. Web-based Instruction.

HDFS 5993* Special Topics in Family and Consumer Sciences Education: 4-H and FCCLA. Prerequisite(s): Admission to the HDFS Great Plains IDEA Graduate Program. Techniques for developing and managing 4-H and FCCLA programs as part of Cooperative Extension Service and public school Family and Consumer Sciences programs. Web-based Instruction.

HDFS 6000* Doctoral Dissertation. 1-12 credits, max 30. Prerequisite(s): Consent of instructor. Research in human environmental sciences for the PhD degree under supervision of a graduate faculty member.

HDFS 6101* Doctoral Seminar in Human Development and Family Science. Prerequisite(s): 5253, 5293, 5513, 5523 or equivalent and consent of instructor. Seminar on topics in human development and family science focusing on current research, theory or application.

HDFS 6102* Doctoral Directed Study in HDFS. 1-9 credits, max 9. Prerequisite(s): 5253, 5293, 5513, 5523 or equivalent and consent of instructor. Doctoral level directed individual study in human development and family science.

HDFS 6123* Advanced Research in Risk and Resilience. Prerequisite(s): 5133 and 5253 or 5293, 5513 or 5523. Integration of current research and theory.
in human development and family science to address current issues in individual and family risk and resilience.

HDFS 6133* Advanced Research Methods in Human Development and Family Science. Prerequisite(s): One course in research methods and one in statistics. Research design and analysis of data appropriate to the areas of human development and family science.

HDFS 6143* Structural Equation Modeling for HDFS Applications. Prerequisite(s): 6133, REMS 6013 or equivalents. Introduction to structural equation modeling (SEM) with applications to longitudinal and grouped data typical of research in Human Development and Family Science. Includes elementary matrix algebra, measurement models (factor analysis), and latent path models, such as growth curve models. Applications using appropriate statistical software.

HDFS 6153* Multilevel Modeling for HDFS Applications. Prerequisite(s): 6133 and REMS 6013 or equivalents. Introduction to advanced statistical methods for analyzing longitudinal and grouped data. Multilevel modeling is emphasized, with brief introductions to other advanced statistical procedures, such as survival analysis and developmental trajectory analysis. Models include occasions nested within persons and persons nested within groups. Applications using appropriate statistical software.

HDFS 6190* Research Internship. 1-15 credits, max 15. Prerequisite(s): Consent of instructor. Special research studies under the supervision of a graduate faculty member.

HDFS 6223* Risk and Resilience in Human Development. Prerequisite(s): 5253 or 5293 or equivalent course. Critical analysis of research and theory on risk and resilience processes in human development across the life course. Emphasis on roles of families in enhancing resilience. Demonstration of application to selected aspects of Individual development.

HDFS 6273* Parent-Child Relations. Examination of theory and research related to parenting and the impact of parenting on the well-being of children, parents and the broader family system.

HDFS 6283* Seminar in Human Development. Prerequisite(s): 5253. Selected topics in human development with special attention given to recent research literature and current theory.

HDFS 6523* Advanced Family Theory. Prerequisite(s): 5523. Family theory process, including logic, theory construction, and relating conceptual orientations to current research areas.

HDFS 6533* Marital and Couple Relationships. In-depth analysis of historical and contemporary research on developmental and relational processes in marital and couple relationships. Emphasis on research and theory addressing the nature, dynamics and developmental course of committed couple relationships.

HDFS 6583* Seminar in Family Science. Prerequisite(s): 5513 or 5523 or consent of instructor. Current research and theory in selected topics in family science.

HDFS 6613* Contemporary Issues in Marriage and Family Therapy. Prerequisite(s): Admission to marriage and family therapy specialization. Critical issues facing students in the marriage and family therapy (MFT) specialization, while taking advantage of the unique expertise of clinical faculty. Professional seminar on dialogue with participants taking an active role in the learning process.

Human Resources and Adult Education (HRAE)

HRAE 4010* Occupational and Adult Education Workshop. 1-3 credits, max 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.


HRAE 5000* Thesis or Report. 2-10 credits, max 10. Students studying for a master’s degree may enroll in this course for a total of two credit hours if they write a report or research hours if they write a thesis. Students working on a specialist’s degree may earn a maximum of 10 hours credit.

HRAE 5010* Seminar. 1-3 credits, max 6. Graduate student seminars focusing on current and critical issues and common problems relevant to occupational and adult education.

HRAE 5223* Organization and Administration of Adult Education. Organizational procedures and administrative practices for effective planning, implementation and management of adult and continuing education programs. Analyses of legislation, finances and community groups that influence and impact upon adult and continuing education programs.

HRAE 5233* Needs Analysis. Techniques of conducting organizational analyses of human performance problems, including surveys, interviews, records analysis, group interaction, and task analysis.

HRAE 5340* Special Problems. 1-6 credits, max 6. Directed independent study of special topics involving assigned readings, library research, field work or a combination of these.

HRAE 5433* Instructional Design for Training. Design and development of training to address performance problems in organizations, business and industry. In-depth study of a systematic approach to training for performance.

HRAE 5533* Human Resource Development. Introduction to training and development, including history and nature of the field, trainer roles, needs analysis, program development, evaluation, and techniques of conducting training.

HRAE 5633* Technology Application in Human Resource Development. The practice, theory, and research related to human resource development applications for technology and background information on specific technology-related topics. Development of technology applications.

HRAE 5703* Adult Learning in Diverse Settings. The study of adult learning in diverse geographic and cultural settings. Interaction with experts in the field and reflection upon their experiences after returning from travel.

HRAE 5730* Special Topics in Human Resource Development. 1-3 credits, max 6. The practice, theory and research related to a current topic in human resource development.

HRAE 5833* Global Consulting. The consulting process, including contract, entry, diagnosis, response, disengagement, closure and ethical considerations. The competencies of successful consultants and trainers in the international environment, including cultural adaptations of self and of training materials.

HRAE 5880* Internship. 3-6 credits, max 6. Supervised experience working in business, industry, human service or education settings.

HRAE 6000* Doctoral Dissertation. 2-10 credits, max 15. Required of all candidates for the Doctor of Education degree in adult education and human resource development.

HRAE 6103* Foundations of Lifelong Learning. The definitions, historical and philosophical development, and the scope and function of lifelong learning.

HRAE 6110* Graduate Readings in Adult Education and Human Resource Development. 1-6 credits, max 6. Prerequisite(s): Consent of supervising professor. Supervised readings of significant literature not included in regularly scheduled courses.

HRAE 6203* Managing Adult Education Research. Analysis and application of techniques necessary for managing research projects in diverse agencies with adult learners. Practice with computer-based programs. Data sets from adult education research projects.

HRAE 6213* Lifelong Learning and Performance. Lifelong learning theory within the context of applications in formal and informal settings in the community as well as in the workplace. Synthesis of research findings on changes of cognitive performance due to aging and analysis of recent literature on participation in adult education and training.

HRAE 6223* Current Research in Adult Education. Analysis of the major research trends in the field of adult education. Recent research studies in the field.

HRAE 6233* Critical Issues in Adult Education. Exploration of current issues of concern to adult educators from diverse settings.

HRAE 6330* Special Topics in Adult Education. 1-3 credits, max 9. Prerequisite(s): 5203, 5213. Analysis and critique of the application of adult learning principles and methods in one of the numerous diverse settings in which adult education is practiced.

HRAE 6340* Independent Study in Human Resources and Adult Education. 1-3 credits, max 9. Directed independent study for doctoral students involved in a research-based project.

HRAE 6533* Organization and Development. Seminar examining the field of organization development. Emergence of the field, diagnosis, performance, change management, the client and the consultation.

HRAE 6633* Advanced Human Resource Development. Prerequisite(s): 5533. Scholarly critique of organizations as adaptive systems and the role human resource development plays in organization, process and individual performance.

HRAE 6880* Internship in Human Resources and Adult Education. 1-8 credits, max 8. 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.

Human Sciences (HS)

HS 1112 Human Sciences First-Year Seminar. Experiences that effectively facilitate transition from high school to the College of Human Sciences at OSU. Identification of the developmental advising process to ensure a successful adviser/advisee partnership. Career development through connections among the student’s major curriculum, general education courses, career goals, and eventual careers. Analysis of case scenarios. Required of all first semester freshmen in COHS.

HS 2080 Introduction to International Experiences. Prerequisite(s): consent of Associate Dean. Introduction to international cultures through an educational experience outside the USA.

HS 2111 Career Exploration in Human Sciences. Acquisition of career
information critical to introduce students to the world of work. Career searches, processes for interviewing and acquiring careers.

**HS 2210 Professional Field Experience in Human Sciences.** 1-3 credits, max 3. Prerequisite(s): Consent of instructor and DHM or HDFS or HRAD or NSCI major and freshman or sophomore standing. Supplied field experience in professional setting related to Human Sciences field of study.

**HS 2510 Human Sciences Freshman Research Seminar.** 1-3 credits, max 6. Prerequisite(s): College of Human Sciences major; Admission to the Freshman Research Scholars program. Seminar for College of Human Sciences' freshmen participating in the Freshman Research Scholars Program. Includes exploration of what “research” means in a variety of settings and introduces basic research skills and processes.

**HS 2511 Dynamics of Leadership in Human Sciences.** Prerequisite(s): consent of Associate Dean. Major topics related to personal and professional development, including developing and utilizing leadership skills, teamwork and team building, total quality management, ethics, public speaking, and business and social etiquette. Open to sophomores in the College of Human Sciences who have been accepted in the Ambassadors student organization.

**HS 3002 Leadership and Collaboration in the Workplace.** Prerequisite(s): Junior standing in a major in the College of Human Sciences. Exploration of personal and workplace leadership, conflict resolution, workplace diversity and ethics. Development of transferable skills and emotional intelligence. Generation of personal mission statements. Current leadership and collaboration strategies, issues and terminology.

**HS 3080 International Experience.** 1-18 credits, max 36. Prerequisite(s): Consent of associate dean. Participation in a formal or informal educational experience outside the United States.

**HS 3090 (J) Study Abroad.** 1-18 credits, max 36. Prerequisite(s): Consent of the Office of Study Abroad and associate dean of the College of Human Sciences. Participation in an OSU reciprocal exchange program.

**HS 3112 Human Sciences First-Year Seminar for Transfer Students.** Experiences that effectively facilitate transition for the first year transfer student to the College of Human Sciences at OSU. Introduction to the developmental advising process to ensure a successful advisor/advisee partnership. Career development through connections among the student’s major curriculum, general education courses, career goals, and eventual careers. Analysis of case scenarios. Requirement of all first semester transfer students in COHS.

**HS 3210 Internship in Human Sciences.** 1-3 credits, max 3. Prerequisite(s): Consent of instructor and DHM or HDFS or HRAD or NSCI major and sophomore standing and HS 1112 or 3112. Supervised internship related to a Human Sciences field of study.

**HS 3511 Public Policy and Human Sciences.** Prerequisite(s): consent of Associate Dean. The impact of human, economic and material resources. Analysis of developmental, ethical, cultural and public policy factors that influence need satisfaction. Open to juniors and seniors in the College of Human Sciences who have been accepted in the Ambassadors student organization.

**HS 4000 Honors Seminar in Human Sciences.** 1-6 credits, max 6. Prerequisite(s): Junior standing and admission to the Honors Program. In-depth interdisciplinary seminar focused on a current national or international issue having an impact on quality of life. Exploration of the issue utilizing various strategies and informational resources. Dialog and debate from multiple perspectives with emphasis on verbal and written expression.

**HS 5110* Directed Studies in Human Sciences.** 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Directed individual study in Human Sciences.

**HS 5240* Master’s Creative Component.** 1-6 credits, max 6. Prerequisite(s): Consent of associate dean. An in-depth application of theoretical models and philosophies related to area of specialization.

**HS 5253* Family Economics.** Issues related to the economics of families, household production, and human capital development; economics of crises public policy and family life cycle spending, saving and borrowing; special attention to the role of ethics in family economic issues. A theoretical and a research perspective used to illuminate the concepts in the course. Web-based instruction.

**HS 5303* Fundamentals of Family Financial Planning.** The nature and functioning of financial systems, including currencies, markets, monetary and fiscal policy, and supply and demand for land, labor and capital. Focus on the impact of global financial interdependence on individuals and families in the U.S. Current and emerging issues, as well as current research and theory relative to financial systems. Web-based instruction.

**HS 5333* Theories and Research in Family Financial Planning I.** Prerequisite(s): Admission to the Great Plains IDEA FFP program. Introduction of the essential science of family finances. Focus on theories of family functioning, microeconomic theory related to family resource allocation decisions, the family as an economic unit, and the interaction of economy and families. Web-based instruction.

**HS 5343* Theories and Research in Family Financial Planning II.** Prerequisite(s): Admission to the Great Plains IDEA FFP program and HS 5333. Microeconomic theory as it relates to family resource allocation decisions, theories of household behavior, the lifecycle hypothesis, behavioral economics, behavioral finance, theories of behavioral change, and psychological theories of family well-being. Focus on empirical research investigating household financial decision-making. Web-based Instruction.

**HS 5353* Financial Counseling for Family Financial Planning.** Theory and research regarding the interactive process between client and practitioner, including communication techniques, motivation and esteem building, counseling environment, ethics, and data intake, verification, and analysis. Legal issues, compensation, technology to identify resources, information management, and current or emerging issues. Web-based instruction.

**HS 5403* Estate Planning for Families.** Fundamentals of estate planning processes, estate settlement, estate and gift taxes, property ownership and transfer, and powers of appointment. Tools and techniques in implementing effective estate plan, ethical considerations in providing estate planning services, new and emerging issues in the field. Experience with case studies in developing and creating estate plans for environment forms. Web-based instruction.

**HS 5433* Retirement Planning, Employee Benefits and the Family.** Study of micro and macro considerations for retirement planning. Survey of various types of retirement plans, ethical considerations in providing retirement planning services, assessing and forecasting financial needs in retirement, and retirement benefits. Web-based instruction.

**HS 5483* Military Family Financial Issues.** An overview of topics relevant to the financial planning process, adapting topics to address the unique needs of and resources available to military service members and their families. Topics include status of service member; financial readiness; financial, risk, investment, tax, retirement, and estate planning; record keeping; insurance; credit and debt management; savings; education planning; and special topics. Web-based instruction.

**HS 5533* Economics of Aging and Public Policy.** Policy development in the context of the economic status of the elderly populations. Retirement planning and wealth transfer decision; Social Security and public transfer programs for the elderly; intrafamily transfers to or from the elderly; private pensions; financing medical care for the elderly; prospects and issues for the future. Web-based instruction.

**HS 5543* Environments and Aging.** Special needs of older people and atmosphere of physical environments in COHS. How do they support these needs? Consideration of the “meaning of and attachment to home.” Application of knowledge to design and management of housing, institutional settings, neighborhoods and communities. Environment-person fit; aging-in-place, assisted living and long-term care; and therapeutic environments. Web-based instruction.

**HS 5553* Insurance Planning for Families.** Study of risk management concepts, tools, and strategies for individuals and families, including life insurance; property and casualty insurance; liability insurance; accident, disability, health, and long-term care insurance; and government-subsidized programs. Current and emerging issues related to tax and insurance implications of employee benefits. Relationships between investment options and employee/employer benefit plans choices. Web-based instruction.

**HS 5603* Investing for the Family’s Future.** Evaluation of investment markets for the household. Analysis of how families choose where to put their savings. Understanding the family’s overall financial and economic goals to help make informed decisions about which investments to choose. Web-based instruction.

**HS 5633* Program Evaluation and Research Methods in Gerontology.** Overview of program evaluation, research methods and grant writing in gerontology. Application of quantitative and qualitative methods in professional settings. Web-based instruction.

**HS 5653* Personal Income Tax for Family Financial Planning.** Information on income tax practices and procedures including tax regulations, tax return preparation, tax audit processes, appeals process, preparation for an administrative or judicial forum, and ethical considerations of taxation. New, emerging issues related to tax with a focus on client financial and individual case studies practice in applying and analyzing tax information and recommending appropriate tax strategies. Web-based instruction.

**HS 5703* Professional Practices in Family Financial Planning.** Challenges of managing financial planning practices, including business valuation, personnel, marketing, client services, ethics and technological applications. Relying on theoretical as well as applied approach, analysis of case studies that provide relevant, practical exposure to practice management issues, with strong emphasis on current research findings. Web-based instruction.

**HS 5803* Case Studies in Family Financial Planning.** Prerequisite(s): 5303, 5403, 5453, 5553, 5603, 5653, 5853. Case studies in financial planning, including ethical considerations, regulation and certification requirements, communication skills, and professional responsibility. Utilization of skills obtained in other courses and work experiences in the completion of professional finance case studies, the development of a targeted investment policy, and other related financial planning assignments. Web-based instruction.

**HS 6993* Graduate Seminar in Human Sciences.** Prerequisite(s): Consent of instructor. Analysis of philosophy, critical issues, current developments and interrelationships among elements in human sciences.
**Industrial Engineering and Management (IEM)**

**IEM 2003** Manufacturing and Service Systems and Tools I. Prerequisite(s): ENGR 1111; MATH 2144. Introduction to definition, design, operation, and improvement of systems that produce goods and services. Case studies featuring classical and contemporary issues in industrial engineering and management. Issues include system effectiveness and efficiency in meeting customer needs, demands and expectations. Introduction to computer-aided tools useful in documentation, analysis, and modeling within contemporary organizations.

**IEM 3103** Introduction to Probabilistic Modeling. Prerequisite(s): MATH 2153. Introduction to concepts and models of randomness, which support industrial engineering and management analyses and decision-making. Includes probability models, statistical models and distributions, Markov processes and Little's Law.

**IEM 3303** Manufacturing Processes. Lab 3. Prerequisite(s): ENGR 1322 and ENSC 3313. Manufacturing processes used to transform new materials into finished goods. Traditional and nontraditional manufacturing processes. Introduction to CAD/CAM. Basic process selection.

**IEM 3403** Collaborative Engineering Project Management. Prerequisite(s): 2903, 3703. Engineering management and group issues involved in project planning, implementation and topics addressed include project management methodologies and software; teamwork structures, processes, and collaborative technologies; process management, leadership and other team roles.

**IEM 3503** Engineering Economic Analysis. Prerequisite(s): MATH 2153. Development and use of time value of money models. Bases for comparison of alternatives, including present worth, annual equivalent, rate of return and payout period methods. Decision-making among independent, dependent, capital-constrained and unequal-life projects. Replacement, breakeven and minimum cost analyses. Depreciation and depletion methods and their effect on corporate income taxes, leading to after-tax cash flow analysis. Introduction to financial reports.


**IEM 3703** Manufacturing and Service Systems and Tools II. Prerequisite(s): ENGR 1111, MATH 2144. Introduction to definition, design, operation, and improvement of systems that produce goods and services. Case studies featuring classical and contemporary issues in industrial engineering and management. Issues include system effectiveness and efficiency in meeting customer needs, demands and expectations. Introduction to computer-aided tools useful in documentation, analysis, and modeling within contemporary organizations.


**IEM 4010** Industrial Engineering Projects. 1-3 credits, max 6. Prerequisite(s): Consent of school head. Special undergraduate projects and independent study in industrial engineering.

**IEM 4013** Introduction to Operations Research. Prerequisite(s): 3103, MATH 3263. Introduction to operations research, analytics, and mathematical optimization with an emphasis on topics in linear, integer, and network optimization. Effective model formulation techniques and computer-aided tools for solving optimization, tactical and operational problems encountered in manufacturing, and service industries. Covers the simplex method, duality theory, sensitivity analysis, branch-and-bound, network simplex, and Dijkstra’s algorithm.

**IEM 4020** Undergraduate Engineering Practicum. 1-3 credits, max 4. Prerequisite(s): Consent of IEM adviser. Admission to the Professional School of Industrial Engineering and Management and satisfactory completion of at least 12 hours of IEM 3000 or 4000 level courses. Professionally supervised experience in real life problem solving involving industrial projects for which the student assumes a degree of professional responsibility. Activities prescribed in advance by the instructor. 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.

**IEM 4103** Introduction to Quality Control. Prerequisite(s): 3103. Performance excellence in a enterprise, including relationships between industrial engineering and quality control. Statistical quality control concepts to measure, monitor, diagnose, and improve performance at the enterprise level, the operational level, and the project level. Quantitative and qualitative tools to solve problems and capture opportunities for improvement.

**IEM 4113** Industrial Experimentation. Prerequisite(s): 3103. Analytical methods for the purpose of process improvement. Experimental designs including single, blocked and multiple factors. Introduction to fractional factorial designs, central composite designs, and Taguchi robust designs. Data collection, analysis, and interpretation, including graphical methods, confidence intervals, and hypothesis tests. Multiple linear regression analysis methods. Industrial applications.

**IEM 4163** Service Systems and Processes. Prerequisite(s): 3103, 3503, 4613. Design and analysis of service systems and processes from the perspective of industrial engineering and engineering management. Application of basic industrial engineering principles and tools applied to service systems. Basics of service quality and productivity, including metrics, measurement and improvement.

**IEM 4203** Facilities and Material Handling System Design. Prerequisite(s): 3303, 3813, 4013, 4713. Design principles and analytical procedures for determining facility location and location of physical assets within a facility. Integration of facilities to material handling system design. Considerations include production processes, product volume, material flow and information flows.

**IEM 4343** Introduction to Micro Devices Assembly. Micro devices assembly: Use of virtual reality in design of micro assembly cells, micro gripping techniques, micro assembly force, and micro assembly control methods. Support rapid assembly of micro devices, review of state of the art. Information modeling and virtual reality technology in the context of micro assembly cell design. No credit for students with credit in 5343.

**IEM 4373** Virtual Engineering for Space Systems. Virtual Reality based design and prototyping of space systems and habitats. Collaborative product and process design. Role of information modeling and concurrent engineering in space systems design. Use of Virtual Reality based prototyping tools to build simulation environments to support different phases of space systems design. Software tools for virtual prototyping.

**IEM 4413** Industrial Organization Management. Prerequisite(s): 2903, 3703. Issues, concepts, theories and insights of engineering management and applications emphasizing effective performance.

**IEM 4613** Production Planning and Control Systems. Prerequisite(s): 4013. Concepts of planning and control for production and control systems. Design of operation planning and control systems. Techniques used in demand forecasting, operations planning, inventory control, scheduling, and process control.

**IEM 4623** Introduction to Supply Chain Management. Prerequisite(s): IEM 3103, IEM 4013 and consent of instructor. Introducing basic concepts and methods in supply chain management. Developing managerial insights into supply chain strategies in the global economy. Measuring supply chain performance under dynamic market conditions. May not be used for graduate credit with IEM 5763.

**IEM 4713** Introduction to Systems Simulation Modeling. Lab 3. Prerequisite(s): 4013. Simulation of discrete-event systems, including problem formulation, translation to a computer model, and use of a model for problem solution as well as concepts of random variable selection and generation, model validation and statistical analysis of results.

**IEM 4723** Information Systems Design and Development. Prerequisite(s): 2903, 3703, Information systems development methodologies, networking technologies, and software tools for the design and development of information systems. Differences phases of system design and implementation. Data modeling using entity-relationship diagrams and process modeling using data flow diagrams, IDEFO and IDEFT. Introduction to enterprise resource planning systems and their use within different enterprise functional units.

**IEM 4913** Senior Design Projects. Lab 6. Prerequisite(s): 3403, 3503, consent of instructor; IEM majors only. Student teams work on professional-level engineering projects selected from a wide range of participating organizations. Projects are equivalent to those typically experienced by professionals and require both oral and written reports. Normally taken during student’s last semester of undergraduate work.

**IEM 4931** Industrial Engineering and Management Seminar. Prerequisite(s): Senior standing. Designed to orient seniors to their professional work environment. Topics include the professional school procedures, research, interviewing, consulting 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.

**IEM 4953** Industrial Assessment and Improvement. Prerequisite(s): Senior standing and consent of instructor. Plant assessment and improvement-based concepts, strategies, and tools for manufacturing operations. Emphasis is on small to medium-sized manufacturing operations. Issues include energy, water, waste, quality, and productivity analysis across the organization from a systems perspective. Justification of improvement projects and measurement of results.
IEM 4990  Selected Topics in Industrial Engineering and Management. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Study of selected contemporary topics in industrial engineering and management, including operations research; quality; manufacturing systems; engineering management; enterprise systems and supply chains; facilities, energy, and environmental management.

IEM 5000  Master’s Research and Thesis. 1-6 credits, max 6. Prerequisite(s): Approval of major adviser. Research and thesis for master’s students.

IEM 5003  Probability and Stat for Engineers. Prerequisite(s): STAT 4033 or IEM 3103. Probability and statistical topics and methods used in various areas of industrial engineering including random numbers, probability theory, conditional probabilities, parameter estimation, confidence intervals, hypothesis testing, and regression models.

IEM 5010  Industrial Engineering Projects. 1-6 credits, max 6. Prerequisite(s): Consent of school head and approval of major adviser. Special graduate projects and independent study in industrial engineering.

IEM 5013  Introduction to Optimization. Prerequisite(s): IEM 4013 or equivalent. Introduction to mathematical programming with an emphasis on linear programming, integer programming, minimum cost network flows and convex programming. Effective formulation techniques, basic mathematical and algorithmic concepts, and software solution of large-scale industrial engineering problems including transportation and assignment.

IEM 5020  Graduate Engineering Practicum. 1-3 credits, max 3. Prerequisite(s): Consent of IEM adviser and satisfactory completion of 12 hours of IEM 5000- or 6000-level courses. Professionally supervised experience in real-life problem solving involving projects for which the student assumes a degree of professional responsibility. Activities approved in advance by the instructor and must reflect graduate level analysis. 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, are required as specified by the adviser.

IEM 5023  Optimization Applications. Prerequisite(s): Graduate standing. A survey of various methods of unconstrained and constrained linear and non-linear optimization. Applications of these methodologies using hand-worked examples and available software packages. Intended for engineering and science students. (Same course as CHE 5703, ECEM 5703 & MAE 5703)

IEM 5030  Engineering Practice. 1-9 credits, max 12. Prerequisite(s): 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.

IEM 5033  Linear Optimization. Prerequisite(s): IEM 5013 or equivalent. Mathematical theory of linear programming and its applications in algorithm development. Fundamentals of convex analysis, polyhedral sets, development of the simplex method, Farkas’ lemma, development of duality theory, sensitivity analysis, Dantzig-Wolfe decomposition, Benders decomposition, interior point algorithms.

IEM 5067  Network Optimization. Prerequisite(s): IEM 5013 or equivalent. Network flows and combinatorial optimization models, and algorithms with an emphasis on applications in transportation and logistics planning. Covers basics of graph theory and complexity theory; algorithms for shortest paths, max flows and min cut, min cost flows, assignments and matchings, min spanning trees, traveling salesman problem, local search and metaheuristics including simulated annealing, genetic algorithm and tabu search.

IEM 5103  Breakthrough Quality. Prerequisite(s): IEM 4103, IEM 4113 and IEM 5003. Structured, systematic approach and advanced statistical and modeling tools to achieve breakthrough improvement across all areas of an enterprise. Rigorous appraoch, innovation, and betterment of strategies and tools for improving or redesigning products and processes such that performance gains are noticeably higher or quicker than those achieved under traditional incremental improvement approaches.

IEM 5113  Strategic Quality Leadership. Prerequisite(s): IEM 4013 and IEM 5003. Quality-related strategies. Critical elements that differentiate high performing organizations from their competitors. Delivering value to customers. Quality leadership, strategic planning, customer value, learning organizations, knowledge management, quality systems and the results.

IEM 5123  Service Quality. Prerequisite(s): IEM 4013 or equivalent. Theory and application of service quality, including characteristics of services (intangibility, heterogeneity, perishability and inseparability of production and consumption), dimensions of service quality, measurement methodologies for service quality and improvement methodologies for service quality. Certification and accreditation processes for service industries.

IEM 5133  Stochastic Processes. Prerequisite(s): MATH 2233, MATH 3013, STAT 5123. 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 & MATH 5133)

IEM 5143  Reliability and Maintainability. Prerequisite(s): STAT 4033 and IEM 5003. 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.

IEM 5153  Process Design and Integration. Prerequisite(s): IEM 4033 or equivalent. Process design, integration, control, and improvement within and between enterprises. Analytical and systems approaches to address physical and logical characterization of inputs, transformation, and outputs. Modeling issues, including process mapping, cause and effect analysis, and impact projection. Purpose, linkages, value, leverage, measurement, creativity and leadership.

IEM 5163  Service Systems and Processes. Prerequisite(s): IEM 3103, 3503, 4613. Design and analysis of service systems and processes from the perspective of industrial engineering and engineering management. Application of basic industrial engineering principles and tools applied to service systems. Basics of service quality and productivity, including metrics, measurement, and improvement.

IEM 5203  Facility Location, Warehousing and Freight Transportation. Prerequisite(s): IEM 4013, IEM 4203 and IEM 5003. Analytical models for single and multi facility location problems. Algorithms for network location problems including the median, center and covering problems. A discussion of storage location policies such as dedicated, randomized and class-based and their relationship to the warehouse location problem. Analysis of decision rules for warehouse material handling systems. Introduction to warehouse management systems, freight movement modeling and transportation infrastructure planning.

IEM 5303  Computer Integrated Manufacturing Systems Design for Higher Volume Products. Prerequisite(s): IEM 4103, 3503 or equivalents. Principles and procedures related to the design, implementation and documentation, and control of manufacturing systems focusing on higher volume, lower product variety production systems. Introduction to product life cycle concepts and the application of computer-aided design and computer-aided manufacturing tools to systems characterized by dedicated production equipment and the need for absolute minimization of unit costs. Product and production system design, analysis, and operation for fixed automation. Operational philosophies and applicable systems concepts, especially those relating to line design, analysis, efficiency, and unit production cost reduction.

IEM 5343  Introduction to Micro Devices Assembly. Prerequisite(s): Graduate standing or consent of instructor. Micro devices assembly. Use of virtual reality in design of micro assembly cells, micro gripping techniques, interactive forces in micro assembly, design of factories to support rapid assembly of micro devices, review of state of the art. Information modeling and virtual reality technology in the context of micro assembly cell design. No credit for students with credit in 4343.

IEM 5350  Industrial Engineering Problems. 1-6 credits, max 6. Prerequisite(s): Approval of major adviser. A detailed investigation into one area of industrial engineering with a required written report.

IEM 5373  Virtual Engineering for Space Systems. Virtual Reality based design and prototyping of space systems and habitats. Collaborative product and process design. Role of information modeling and concurrent engineering in space systems design. Use of Virtual Reality based prototyping tools to build simulation environments to support different phases of space systems design. Software tools for virtual prototyping.

IEM 5413  Managing the Engineering and Technical Function. Prerequisite(s): 4413 or equivalent industrial experience. Advanced study of the engineering and technical organization. Engineering and technical functions, management process, roles, and activities. Individual study of current technical management issues of student interest.

IEM 5503  Financial and Advanced Capital Investment Analysis. Prerequisite(s): 3503, 4013, STAT 4033 or IEM 3103 or equivalent. An understanding of financial concepts and markets, and an advanced treatment of proper methods of capital project selection under risk and uncertainty. Decision making under capital rationing. Financial environment and valuing securities, representing cash flows, selecting investments, avoiding common pitfalls, evaluating timing consideration, depreciation and corporate taxation, replacement analysis, and incorporating risk and uncertainty.

IEM 5603  Project Management. Prerequisite(s): 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 utilization.


IEM 5633  Advanced Production Control. Prerequisite(s): IEM 4103, 4613. 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 disaggregation, 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.

IEM 5703* Discrete System Simulation. Prerequisite(s): IEM 4013, IEM 4203 and IEM 5003. 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 simulation languages and related software tools.

IEM 5723* Data, Process and Object Modeling. Prerequisite(s): Graduate standing or consent of instructor. Logical and physical models in the analysis, design and improvement of enterprise systems. Structured and object-oriented analysis and design techniques. Data modeling using entity-relationship diagrams and IDEF1X. Data normalization techniques. Production modeling using data flow diagrams, IDEF0, IDEF3, and Petri nets. Object modeling using the unified modeling language (UML).

IEM 5743* Information Systems and Technology. Prerequisite(s): Graduate standing or consent of instructor. For current and potential engineering and technology managers. Knowledge of information systems and technology to lead the specification, selection, implementation, and integration of information technology in manufacturing and service organizations. Management issues involved in the use of information technology in organizations.

IEM 5763* Supply Chain Strategy. Prerequisite(s): IEM 4613 or equivalent. Supply chain strategy including the philosophical base of business practice and the analytical base of modeling. Supply chain strategy, including key objectives and financial considerations, supply chain dynamics, supply chain performance measurement, supply chain integration, characteristics of different supply chains and supply chain performance modeling.

IEM 5773* Supply Chain Modeling. Prerequisite(s): 5763 and 5013 or 5033 and 4713 or 5703 or equivalents. Supply chain analysis using different approaches to the supply chain modeling, including the Supply Chain Council’s SCOR (Supply Chain Operations Reference) model, optimization and simulation. Specialized and standardized tools to develop each modeling approach.


IEM 5813* Performance Measurement Systems. Prerequisite(s): 5813, 4413 or equivalent. Strategies and methods to define, measure, and apply individual, group- and organizational-level performance metrics in a variety of service and production contexts. Implementation and effective use of metrics. Measurement’s role in a management system, managerial decision styles and preferences, operating control, and performance feedback. Basic quantitative performance measurement and control methods. Application to decision-making and performance measurement.

IEM 5833* Industrial Assessment and Improvement. Prerequisite(s): Senior standing and consent of instructor. Plant assessment and improvement-based concepts, strategies, and tools for manufacturing operations. Small to medium-sized manufacturing operations. Energy, water, waste, quality, and productivity analysis across the organization from a systems perspective. Justification of improvement projects and measurement of results.

IEM 5900* Special Topics in Industrial Engineering and Management. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Study of selected contemporary topics in industrial engineering and management including operations research; quality and reliability; manufacturing systems; engineering management; enterprise systems and supply chains; facilities, energy, and environmental management.

IEM 6000* Doctoral Research and Dissertation. 1-15 credits, max 30. Prerequisite(s): Approval of major adviser and advisory committee. Independent research for PhD dissertation requirement under direction of a member of the Graduate Faculty.

IEM 6033* Linear Optimization. Prerequisite(s): IEM 5013 or equivalent. Mathematical theory of linear programming and the implications for algorithm development. Fundamentals of convex analysis, polyhedral sets, development of the simplex method, Farkas’ lemma, development of duality theory, sensitivity analysis, and Dantzig-Wolfe decomposition. Benders decomposition, interior point algorithms. Previously offered as IEM 5033.

IEM 6043* Nonlinear Optimization. Prerequisite(s): IEM 5033 or equivalent. Mathematical theory and algorithms of nonlinear optimization. Convexity, local/global optima, optimality conditions and duality in nonlinear programming and their effect on model and algorithm development. Convex analysis, optimality conditions and algorithms for unconstrained/constrained optimization. Lagrangian duality, relaxation-linearization techniques and interior point algorithms for convex optimization. Previously offered as IEM 5043.

IEM 6053* Integer and Combinatorial Optimization. Prerequisite(s): IEM 5033 or equivalent. Theory and algorithms of integer programming. Formulation of binary, pure, and mixed integer linear programs, relaxations, duality, preprocessing, implicit enumeration, branch and bound, cutting plane methods, column generation, Lagrangian relaxation, Benders decomposition; theory of polyhedra, convex hulls and facets, theory of valid inequalities, superadditivity and master polytope, lifting and projection. Previously offered as IEM 5110.

IEM 6110* Special Problems in Industrial Engineering. 1-6 credits, max 12. Prerequisite(s): 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.


IEM 6133* Dynamic Programming and Stochastic Control. Prerequisite(s): 5013. Models and solution techniques for problems of sequential decision making under uncertainty. Deterministic discrete-time optimal control, deterministic continuous-time optimal control, stochastic optimal control with perfect state information, stochastic optimal control with imperfect state information, and infinite horizon problems.

IEM 6693* IEM Doctoral Seminar. The IE&M Doctoral Seminar is designed to train the doctoral student in the doctoral dissertation research process and is normally taken in the first year of the student’s program. The course involves significant work outside the classroom, under the supervision of the student’s research faculty advisor. The course will use for formal instruction on research methods/process, discussion of current research in IEM lead by select faculty, guest speakers, and presentations by students.

IEM 6990* Advanced Topics in Industrial Engineering and Management. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Study of advanced topics in industrial engineering and management including research on design, quality and reliability, manufacturing systems, engineering management, enterprise systems and supply chains, facilities, energy, and environmental management.

Interdisciplinary Toxicology (ITOX)

ITOX 5103* Biochemical Toxicology. Prerequisite(s): Graduate standing; consent of instructor. In-depth overview of biochemical and molecular mechanisms of interactions between exogenous chemicals and living systems. Transport, distribution, elimination and alteration of exogenous chemicals within the body and mechanisms whereby exogenous chemicals disrupt biochemical processes critical for cell/organ/organismal integrity and function. (Same course as VANE 5103*)

ITOX 5282* Methods of Forensic Science. Advanced-level laboratory course in which students apply knowledge from earlier course work in a hands-on setting and employ fundamental techniques and methods related to forensic biology, forensic microbiology, forensic pathology, and forensic toxicology. (Same course as FRNS 5282)

ITOX 5303* Organismal Ecotoxicology. Prerequisite(s): Consent of instructor. Comparative study of the major groups of environmental contaminants (e.g. heavy metals, PCB’s, insecticides) and an introduction to the basic theories, principles and techniques associated with the study of contaminant fate and effects on organisms. (Same course as ZOOL 4303 and 5303*)

ITOX 5343* Population & Community Toxicology. Prerequisite(s): course in ecology strongly recommended. Examines the exposure of animals to environmental contaminants and resulting effects at the individual through community level. The dynamic nature of exposure to contaminants will be of particular interest in this course. For example, how do the natural history traits of a species either protect it from exposure, or enhance its potential for exposure to contaminants? Topics will range from the historical perspectives to ecotoxicology to study design and risk assessment. (Same course as ZOOL 5343*)

ITOX 5423* Techniques in Environmental Toxicology. Prerequisite(s): organic chemistry or consent of instructor. Practical understanding of modern techniques used to quantify exposure and effects of environmental toxicants. Laboratory topics include gas chromatography, HPLC, atomic absorption spectroscopy, immunoassay, and toxicology testing. (Same course as ZOOL 5423*)

ITOX 5523* Forensic Toxicology. Introduction of fundamental aspects of forensic toxicology and emphasis on major subfields of postmortem forensic toxicology, human performance toxicology and forensic drug testing. Examination of methodologies and analyses associated with these three major subfields. (Same course as FRNS 5523*)

ITOX 5543* Advanced Forensic Toxicology. Prerequisite(s): FRNS 5523*. Familiarizes the student with advanced aspects of forensic toxicology in view of current forensic toxicological trends. Covers risk assessment principles, factors in pharmacokinetics, weapons of mass destruction, and integrating concepts
with current applications. (Same course as FRNS 5543*)

ITOX 6213 Toxicology: From Molecules to Ecosystems. Prerequisite(s): Graduate standing; consent of instructor. An integrated systems-based approach to toxicology form molecular, cellular, organ, organismal, and ecological perspective. (Same course as VBSC 6213*)

ITOX 6223 Xenobiotic Disposition. Prerequisite(s): Graduate standing; consent of instructor. Discussion of xenobiotic absorption, distribution, metabolism, and excretion. Analysis of xenobiotic concentration-time data using pharmacokinetic software. (Same course as VBSC 6223*)

ITOX 6543* Neurochemical Toxicology. Prerequisite(s): BIOM 5215*, 5816*. The fundamental aspects of neurochemistry and neurotoxicology using both cellular and molecular approaches in neurotoxicology will be emphasized using the effects of exogenous toxins such as heavy metals, pesticides, solvents, and drugs of abuse and their role in the pathogenesis of neurological toxicity.

ITOX 6820* Selected Topics in Biochemistry. Prerequisite(s): BIOC 5853*. Recent developments in biochemistry. Subject matter varies from semester to semester; students should inquire at the department office before enrolling. (Same course as BIOC 6820*)

International Studies (INTL)

INTL 4020 Independent Study. 1-3 credits, max 6. Prerequisite(s): Instructor permission. Directed study in student’s area of interest.

INTL 4110 Internship in International Studies. 1-3 credits, max 6. Prerequisite(s): Instructor permission. Internship in International Studies.

INTL 4200 Study Abroad. 1-6 credits, max 6. Prerequisite(s): Consent of instructor and consent of SIS Director of Academic Programs. Academic work abroad may be either a group or individual basis.

INTL 5000* Master’s Thesis. 1-6 credits, max 6. Prerequisite(s): Graduate standing and consent of adviser. For students studying for a master’s degree in international studies under the thesis option.

INTL 5013* Contemporary Issues in International Studies. Prerequisite(s): Enrollment in MS program in International Studies or enrollment in an OSU graduate program and consent of instructor. Examination of major transnational issues and associated problems of international cooperation, including ethnic conflicts, environmental degradation, global standards for human rights, and economic globalization.

INTL 5020* Independent Study. 1-3 credits, max 6. Prerequisite(s): Consent of supervising faculty member. Readings and directed study in student’s focus area.

INTL 5043* Politics of the Global Economy. Prerequisite(s): Graduate standing. Theory and practice of international political economics. The patterns and associations between political and market-based processes among nation-states. Emphasis on interactions among advanced industrial states, transnational phenomena, and opportunities and pitfalls in north-south relations. (Same as POLS 4043)

INTL 5100* Research in International Studies. 3-6 credits, max 6. Prerequisite(s): Graduate standing. Individually supervised research on topic within the student’s area of interest. (For the International Studies Program)

INTL 5110* International Studies in Internship. 1-6 credits. Prerequisite(s): Graduate standing and consent of Director. Individually supervised internships in international career areas.

INTL 5200* Study Abroad. 1-6 credits. Prerequisite(s): Graduate standing, consent of instructor, and consent of SIS Director of Academic Programs. Academic work abroad may be either a group or individual basis.

INTL 5223* Culture, History and World Systems. Prerequisite(s): Graduate standing. Study of the impact and influence of culture and history on the development of contemporary world systems with future projections. (Same course as SOC 5223*)

INTL 5233* Global Competitive Environment. Development of a global business strategy for the organization. Issues of highly diversified markets and business environments, global competition, financial markets, and complex organizational relationships. (Same course as MKTG 5233*)

INTL 5333* Certified Global Business Professional. This course deals with the practicalities of international trade. Topics include finding appropriate partners, international pricing, legal considerations, tax and accounting issues. International market and cultural issues are also addressed. The course is designed to prepare students to successfully complete certification as a Global Business Professional (CGBP certification).

Japanese (JAPN)


JAPN 1225 Elementary Japanese II. Prerequisite(s): 1115 or equivalent. Reading, the writing system, culture, grammar, conversation. Not for native speakers per University Academic Regulation 4.9.


JAPN 3013 Advanced Japanese Conversation. Prerequisite(s): 20 hours of Japanese or equivalent proficiency. Designed to increase facility and naturalness of delivery in dialogue. Development of general oral and aural proficiency.

JAPN 3133 Readings in Japanese. Prerequisite(s): 20 hours of Japanese or equivalent proficiency. Development of the student’s competence in reading a wide variety of materials by contemporary Japanese writers.

Landscape Architecture (LA)

LA 1013 Introduction to Landscape Architecture and Landscape Management. An overview of the fields of landscape architecture and landscape management with an emphasis on the application of artistic and scientific principles of design, planning, and management of natural and built environments.

LA 2213 Visual Communication I for Landscape Architecture. Lab 3. The practice and application of drafting, freehand sketching, design vocabulary, and design concepts to explore, communicate, and represent built and imagined landscapes.

LA 2223 Visual Communication II for Landscape Architecture. Visual journaling and communication. The practice and application of delineation techniques and computer based multimedia for conveying information and conceptual ideas about landscape through the development of understandable graphic presentations.

LA 2323 Computer-Aided Design. Principles of electronic drafting and visual communication techniques related to the landscape for two-dimensional and three-dimensional systems.

LA 2513 (D) Native American Symbolism in Landscape Design. Lab 3. Study of cultural diversity through Native American symbolism and application of these symbols as design elements relating to functional and aesthetic qualities in landscape design.

LA 2523 Garden Design in Harmony with Local Ecology. Lab 3. History, theory, and practice of creating gardens in harmony with local ecology to express aesthetic and cultural values of individuals and societies. Environmental aspects of place related to design form and expression.

LA 3010 Internship in Landscape Architecture. 1-7 credits, max 10. Prerequisite(s): 45 credit hours and consent of internship supervisor. Supervised work experience with approved public or private employers in landscape architecture or related fields. May not be substituted for other required courses. Graded on a pass-fail basis.

LA 3112 Landscape Architecture Regional Built Works. Prerequisite(s): 1013. Analysis of various aspects of the landscape architecture profession and design work with guest speakers. One-day field trips to selected sites in the region to view landscape architecture built works and visit professional offices. Required of third year students.

LA 3315 Studio I: Principles and Theory of Design. Lab 9. Prerequisite(s): LA 1013, LA 2223 and concurrent enrollment in LA 2323. Introduction to basic elements, principles, and theory of design. Exploration of design process, both 2D and 3D form, spatial organization, and temporal nature of landscape. Applied projects in small scale landscape design.

LA 3325 Studio 2: Site Design. Lab 9. Prerequisite(s): 3315. Design process, site inventory and analysis as it relates to physical and social site design. Place making, experimental, behavioral, and environmental considerations among several issues to be examined. Applied projects will focus on residential design, site design and design development.

LA 3673 (H) History and Theory of Landscape Architecture. Introduction to the history of the built environment from ancient to contemporary time that have created the styles of historical significance in landscape architecture. Examination of the social, philosophical, cultural, economic, political, and environmental conditions of the built environment within design theory.


LA 3844 Landscape Architectural Construction 1: Site Grading. Lab 4. Prerequisite(s): LA 2323 and MCAG 2313. Review of common construction techniques, understanding contours, principles of stormwater runoff, site grading and earthwork calculations, methods of managing stormwater runoff, erosion control, introduction to paving and drainage construction, materials, specifications, cost estimating, Computer applications and hand graphics used for projects.

LA 3894 Landscape Architectural Construction 2: Sustainable Applications. Lab 4. Prerequisite(s): LA 2323 and LA 3884. Sustainable stormwater management practices, including green roofs, rain gardens, pervious paving, bioretention, bioswales, riparian buffers, infiltration trenches,
water conservation, and green streets. Introduction to sustainable materials and their applications. Computer applications and hand graphics used for projects. LA 4034* Landscape Planting Design. Lab 4. Prerequisite(s): 3324, HORT 2313 and 2413. Plants in the landscape as aesthetic and functional elements. Environmental enhancement by and for plants. Preparation of planting sketches, plans and specifications.

LA 4053 (I) International Experience in Landscape Architecture - Japan. Prerequisite(s): Consent of appropriate faculty member. Participation in a formal or informal educational experience related with landscape architecture in Japan.

LA 4063 (I) International Experience in Landscape Architecture - Peru. Prerequisite(s): Consent of appropriate faculty member. Participation in a formal or informal educational experience related with landscape architecture in Peru.

LA 4112 Landscape Architecture National Built Works. Prerequisite(s): LA 4425 and consent of instructor. Examination of the issues of the design/build environment, sustainable strategies for land use and rehabilitation, and professional practice while exploring career opportunities for students. Expose students to built works, including sustainable-developed sites, and landscape architectural professional offices with targeted practices and market niches. Includes 4-6 day out-of-state field trip component.

LA 4415* Studio 3: Recreation and Open Space Design Lab 9. Prerequisite(s): 3325, 3884. Recreation and play, the interface of nature, human-kind and land ethic. Applied projects will address structured and nature play, active and passive recreation. Open space planning, open natural landscapes.

LA 4423* Planning and Design for Sustainable Landscapes. Explore the origins of sustainability as a basis for understanding how to improve the planning and design of natural and cultural environments in the practice of landscape architecture.

LA 4425* Studio 4: Ecological Planning and Community Design Lab 9. Prerequisite(s): LA 4415. Introduction to the principles of landscape ecology applied to the analysis of the designed environment. Projects on community design will address ecological and sustainable issues and provide ecologically sound and aesthetically appealing creative solutions.

LA 4433* Land Use and Community Planning. Historical survey of land use and community planning as it has informed the discipline of landscape architecture. Contemporary municipal framework of comprehensive plan, zoning, planned use development and subdivision regulations to land use, new urbanism, and designed communities.

LA 4453* Principles of Landscape Analysis for Site Design. Prerequisite(s): 2323 and 3325. Analysis of landscapes for design and management decision-making using real-world projects integrating computer-aided design (CAD) and geographic information systems (GIS), aerial photography, and global positioning system (GPS) technologies. Applications will be related to landscape architecture and site design.

LA 4515* Studio 5: Urban Design Lab 9. Prerequisite(s): 4425, 4894. Contemporary urban issues affecting the design process, site master planning, and multi-disciplinary problem solving. Applied project will address influences on urban design, from regional influences to user behavior.

LA 4525* Studio 6: Collaborative Design Lab 9. Prerequisite(s): 4515. Exploration of the principles of design teams, professional office environments, and community involvement. This capstone course will apply collaborative comprehensive solutions to community based projects while addressing environmental, social, and economic dynamics.

LA 4573* Recreation Planning. Lab 2. Prerequisite(s): 3324. Theory and methods for small and large scale area planning with emphasis on natural and cultural resources.

LA 4583* Landscape Environmental Planning. Prerequisite(s): 3325. Development of landscape architectural projects in the context of the National Environmental Policy Act (NEPA) and state and local government environmental regulations affecting planned projects encountered by the landscape architect.

LA 4894* Landscape Architectural Construction 3: Materials and Methods. Lab 4. Prerequisite(s): LA 2323 and LA 3884. A capstone course using design techniques, computer skills, construction materials, methods and applications for the landscape industry. Detailed computerized construction drawing of pavements, fences, walls, wood structures, and water features. Comprehensive construction documents using computer drafting, design and calculation applications.

LA 4990* Landscape Architecture Special Problems. 1-6 credits, max 12. Prerequisite(s): Consent of appropriate faculty member. Landscape architectural related problems.

LA 5110* Advanced Special Problems. 1-2 credits, max 20. Prerequisite(s): Consent of appropriate faculty member. Specific landscape architectural problems.

Latin (LATN)

LATN 1113 Elementary Latin I. The rudiments of beginning Latin: grammar, vocabulary and elementary readings.

LATN 1223 Elementary Latin II. Prerequisite(s): 1113 or equivalent proficiency. Continuation of 1113. Grammar, vocabulary and readings.

LATN 2113 Elementary Latin III. Prerequisite(s): 1223 or equivalent. A continuation of 1223. Grammar and readings of Latin authors.

LATN 2213 Intermediate Readings. Prerequisite(s): 2113 or equivalent proficiency. Readings from Virgil’s Aeneid.

LATN 3330 Advanced Readings in Latin. 1-6 credits, max 9. Prerequisite(s): 2213. Prose authors, poetry, and medieval Latin.

LATN 4113 (H) Latin Literature in Translation. Readings of significant works from Latin literature in English translation, from the late Republic through the early Christian era. Readings and classes conducted in English.

Legal Studies in Business (LSB)

LSB 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.

LSB 3010 Special Topics in Legal Studies in Business. 1-3 credits, max 6. Prerequisite(s): 3213, prior consent of instructor. Analysis of a contemporary topic in business law. Changing social issues and trends in legal studies in business.

LSB 3213 Legal and Regulatory Environment of Business. Prerequisite(s): Junior standing. 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.

LSB 4323 Law of Commercial Transactions and Debtor-Creditor Relationships. Prerequisite(s): 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.

LSB 4403 Law and Entrepreneurship. Prerequisite(s): 3213 or permission of instructor. Explores how to recognize and ethically manage legal risks within an emerging enterprise in order to optimize opportunities. Topics include: evaluating appropriate business organizations; understanding alternatives for obtaining capital; using employees to help achieve organizational goals; protecting intellectual property; and complying with the regulatory environment when advertising and marketing a product or service.

LSB 4413* Law of Business Organizations. Prerequisite(s): 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.

LSB 4423* (D) Employment Law. Prerequisite(s): LSB 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 opportunities and affirmative action, fair labor standards, safety in the workplace and state workers compensation laws. Same course as LSB 5423.

LSB 4523* Law of Real Property. Prerequisite(s): 3213 or equivalent. Nature of real property and of the legal transactions relating thereto. Topics may include deeds and conveyancing, landlord-tenant relationships, mortgages, easements, oil and gas interests, types of estates, joint ownership, and legal descriptions.

LSB 4633 (I) Legal Aspects of International Business Transactions. Prerequisite(s): 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.

LSB 5010* Research and Independent Studies. 1-3 credits, max 10. A workshop arrangement or supervised independent study.

LSB 5163* Legal Environment of Business. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. 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.

LSB 5203* Foundations of Issue and Conflict Management. Provides professionals from all fields with the skills necessary to handle conflicts, solve disputes, influence decisions and develop positive interpersonal relationships. It provides an overview of the alternative dispute resolution processes by utilizing readings, research, discussion and role-playing exercises.

LSB 5213* Mediation and Facilitation: Theories and Practice. Prerequisite(s): 5203. This course examines the theories, skills, and boundaries of the mediation and facilitation processes, and analyzes the role of the third party neutral in the intervention and resolution conflicts. Ethical, practical and legal constraints are also addressed.

LSB 5233* Introduction to Arbitration and Litigation. Prerequisite(s): 5203.
This course examines the elements and process of arbitration, situations, in which arbitration skills are required, including construction, securities, civil conflicts, labor disputes and commercial contracts. Topics include comparisons to litigation, the role of judicial review and the enforcement of arbitration awards.

**LSB 5290** Seminar in Negotiation and Alternative Dispute Resolution. 1-3 credits. Prerequisite(s): Consent of instructor. Individual investigations in the areas of issue and conflict management under the direct supervision of a faculty member.

**LSB 5423** Employment Law. Prerequisite(s): LSB 3213 or equivalent or permission of instructor. 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, collective bargaining, and safety in the work place. Students may not take both LSB 4243 and LSB 5423 for degree credit.

**Leisure (LEIS)**

**LEIS 1232** Beginning Golf. Lab 2. Theory and practice of basic skills, rules, terminology and etiquette.

**LEIS 1242** Beginning Tennis and Racquetball. Lab 2. Theory and practice of tennis and racquetball: basic skills, rules, terminology, and game strategy for singles and doubles play. No credit for students with credit in 1242.

**LEIS 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.


**LEIS 1342** Physical Fitness. Lab 2. Theory and practice of aerobic and weight training activities with learning experiences designed to promote physical fitness.

**LEIS 1352** Weight Training. Lab 2. Improvement of muscular strength and endurance in the major muscle groups of the body through progressive resistive exercise. Fundamental anatomy, physiology, mechanical principles, methods and techniques as applied to weight training programs.

**LEIS 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.

**LEIS 2112** Rock Climbing. Lab 2. Theory and practice in the basics of technical rock climbing, bouldering and spelunking.

**LEIS 2122** Backpacking and Hiking. Lab 2. Theory and practice of outdoor skills and leadership techniques for executing and evaluating a wilderness activity.

**LEIS 2322** Recreational Dance. Lab 2. Theory and practice of traditional social dances and a variety of “free style” dance forms.

**LEIS 5000** Master’s Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of major professor. Research in leisure studies for master’s degree.

**LEIS 5010** Directed Study in Leisure Services. 1-3 credits, max 20. Directed study in leisure studies for topics not included in other courses.

**LEIS 5020** Workshop in Leisure Studies. 1-6 credits, max 20. Prerequisite(s): Consent of instructor. Advanced instruction on specialized topic area in leisure studies.

**LEIS 5023** Legal Aspects of Health, Physical Education and Leisure Services. The application and interpretation of the law as it applies to teachers, coaches and administrators of health, physical education and leisure services programs.

**LEIS 5030** Field Problems in Leisure Studies. 1-6 credits, max 20. Prerequisite(s): Consent of instructor. Applied research within the practice of leisure studies.

**LEIS 5073** Therapeutic Recreation and Geriatrics. Prerequisite(s): 2433 or consent of instructor. Role of Therapeutic Recreation (TR) specialists working with the geriatric population. Topics include terminology, etiology, prognosis, assessment, and program development in TR.

**LEIS 5403** Interpretation in Leisure Services. 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.

**LEIS 5413** Organization and Administration of Leisure Services. Systematic approach to problem solving and decision-making for structure, personnel management, finance and program development for leisure service delivery systems.

**LEIS 5423** Supervision and Leadership in Leisure Services. Prerequisite(s): Graduate standing. Administrative supervision and leadership in leisure services delivery systems. An examination of theories and practice as it relates to human, programmatic, and facility resources.

**LEIS 5433** Current Issues in Leisure Services. Prerequisite(s): Admission to the leisure studies program. Current issues related to the leisure services profession. Investigation, discussion and analysis of contemporary issues.

**LEIS 5443** Social Foundations of Leisure Services. Prerequisite(s): Graduate standing. Social, psychological, philosophical and historical foundations of leisure. The impact of social forces on leisure throughout history.

**LEIS 5453** Social Psychology of Leisure. Inquiry into the understanding of human behaviors, thoughts and attitudes related to leisure, and the understanding of complex issues related to the social psychology of leisure.

**LEIS 5463** Issues in Therapeutic Recreation. Prerequisite(s): LEIS 2433 or professional experience in therapeutic recreation. Current issues in therapeutic recreation with emphasis on accreditation, certification, licensure, quality assurance and ethics.

**LEIS 5473** Leisure and Aging. Prerequisite(s): 2433 or consent of instructor. Overview of the leisure needs and services for older adults, with emphasis upon the delivery system and leisure interventions.

**LEIS 5483** Therapeutic Recreation for Persons with Physical Disabilities. Prerequisite(s): 3483 or consent of instructor. Role of therapeutic recreation in the treatment and rehabilitation of individuals with physical disabilities, with emphasis on terminology, prognosis, etiology of specific disabilities, program development and assessment.

**LEIS 5493** Therapeutic Recreation in Mental Health and Mental Retardation. Prerequisite(s): 3483 or consent of instructor. Role of therapeutic recreation in mental health with emphasis upon client prognosis and methodologies of treatment programs.

**LEIS 6000** Doctoral Dissertation. 1-25 credits, max 25. Required of all candidates for the Doctor of Philosophy degree. Credit is given upon completion of the dissertation.

**LEIS 6010** Independent Study in Leisure Studies. 1-6 credits, max 20. Prerequisite(s): Consent of instructor. Supervised readings, research or study of trends and issues related to leisure studies.

**LEIS 6013** Professional Issues in Leisure Studies. Prerequisite(s): Admission to the Graduate College. Introduction to higher education issues relevant to professional preparation in leisure studies curricula, including roles of the educator, curriculum development, implementation and management, instructional strategies and accreditation.

**LEIS 6020** Leisure Research Colloquium. 1-3 credits, max 20. Prerequisite(s): Graduate student standing. Exploration and presentation of selected topics and research in leisure studies.

**LEIS 6023** Special Topics in Leisure Studies. Prerequisite(s): Admission to the Graduate College. Special topics related to recreation, parks and leisure studies. Investigation, discussion and analysis of contemporary topics.

**LEIS 6043** Ethical Issues in Health, Leisure, and Human Performance. Prerequisite(s): Admission to the Graduate College. A survey of ethical issues with specific emphasis on health, leisure, and human performance in higher education.

**LEIS 6453** Leisure Behavior. The advanced study of leisure and human behavior. Research related to the understanding of how and why humans engage in leisure.

**LEIS 6763** Management in Health, Leisure, and Human Performance Settings. Prerequisite(s): Admission to the Graduate College. Essential elements of organizational structures, management issues, functions and styles in public, non-profit and private settings in health, leisure and human performance.

**Library Science (LBSC)**

**LBSC 1011** Library and Internet Information Competencies. Introduction to the organization, retrieval and evaluation of information found in research libraries and on the Internet. Development of information-seeking competencies using both print resources and electronic databases.

**LBSC 5013** Library Media Center in the Schools. Effective utilization of the centralized school media center for the teaching-learning process.

**LBSC 5113** Selection and Organization of Informational and Educational Resources. Selection, evaluation, organization and use of informational and educational resources.

**LBSC 5413** Organization of Information. Basic principles of the organization of information in schools. Information and knowledge organization techniques that exist or are emerging and focuses on standards and tools that are used in educational environments.

**LBSC 5613** Library Networks and Databases. Introduction to the organization, retrieval and evaluation of information found in research libraries and on the Internet. Development of information-seeking competencies using both print resources and electronic databases.

**LBSC 5823** Administration of School Library Media and Technology Programs. Vision of, planning, organizing, policy making, staffing, budgeting, decision-making and evaluating a standards-based school library media or school technology program.

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Management (MGMT)

MGMT 3011 Business, Government and Society. Students will be exposed to topics in business sustainability including ethics and corporate responsibility; social environmentalism and stakeholders; natural environment and externalities; and the regulatory environment.

MGMT 3013 Fundamentals of Management. Survey of management principles and techniques. Examines a variety of issues at individual, team and organizational levels and challenges faced by today's managers.

MGMT 3023 Management of Sustainable Enterprises. Students will be introduced to the social, economic, and natural environment and the interdependence between these forces. The course will cover the external drivers of sustainability as well as internal responses to these pressures. Students may not take both MGMT 3023 and MGMT 5023* for credit.

MGMT 3123 Managing Behavior and Organizations. Prerequisite(s): 3013. Focuses on the complexities of human behavior in organizational settings. Performance expectations and determinants at the individual, team and organizational levels are examined. Priority enrollment is given to management majors.

MGMT 3133 Developing Leadership Skills. Prerequisite(s): 3013. The study of personal, interpersonal and group factors relating to leadership performance. An integration of the theory and practice of leadership.

MGMT 3143 Business Career Development. Prerequisite(s): MGMT 3013. Topics include career planning, company research, interviewing techniques, networking and personal selling. Students develop strategies to develop their professionalism, confidence and sophistication.

MGMT 3313 Human Resource Management. Prerequisite(s): 3013. Policies and practices used in personnel management. Focuses upon the functions of a human resource management department.

MGMT 3513 Human Resource Analytics. Prerequisite(s): MGMT 3313. This course focuses on the application of analytic procedures and theories to the practice of human resource management. Topics include: research methods, psychometric, descriptive statistics, inferential statistics, correlation, linear prediction, and other methods as deemed appropriate by the instructor. Students will show competence in proper data collection and evaluation techniques, as well as skills necessary to write up and present quantitative findings. Students may not take both STAT 3013 or PSYC 3214 and MGMT 3513 for degree credit.

MGMT 3943 Sports Management. Prerequisite(s): 3013. Basic management skills necessary in the operation of sport organizations. The social, behavioral and managerial foundations of sport management, public relations, finance, economics, budgeting in the sport industry and managing a sports facility.

MGMT 3963 Social Issues in Sports Management. Analysis of the external environment and its relationship to sports management will be explored. Topics include social issues will be discussed and presented and students will gain insight on how sports organizations operate complex issues.

MGMT 4011 Crucial Interactions. Examines methods for increasing positive communicative behavior between you and organizational members. Crucial conversations are those conversations that we must have. Ways to increase the free-flow of dialogue to maximize benefit from a crucial conversation are discussed. No credit for students with credit in 5011.

MGMT 4013 Current Topics in Management and Leadership. Prerequisite(s): 3013. Examination of selected topics representing the most current management and leadership theories and practices.

MGMT 4021 Managing Professional Relationships. The study of political behaviors and ways to use them effectively in order to be successful in your career. Ways to be prepared for political dynamics at work and what you can do to emerge a winner will be discussed. No credit for students with credit in 5021.

MGMT 4031 Leading Organizational Change. An introduction to ways of leading change in an organization to keep pace with the economy and the competition. Building an eight step process for developing, selling and implementing change initiatives. No credit for students with credit in 5031.

MGMT 4041 Performance Management. A study of the role of a performance management (PM) system in an organization, the basic components of a PM system (standards, measurement, judgment and action), PM methods and performance management interviews and the Balanced Scorecard. No credit for students with credit in 5041.

MGMT 4051 Creating Ethical Work Places. An examination of the meaning of ethics in business and human resource management, how ethical, work-related behavior can be increased, and how ethical organizational cultures facilitate organizational effectiveness. Establishing and critiquing an ethics program and examining your own code of ethics. No credit for students with credit in 5051.

MGMT 4061 Managing Confrontations. Crucial confrontations directly address gaps between expectations and performance with a model that ensures individual and team effectiveness. Learn to hold people accountable, master face-to-face performance discussions, motivate without using power, enable without taking over, and move to action. It will improve the quality of your life and of your organization. No credit for students with credit in 5061.

MGMT 4063 Management of Corporate Philanthropy. The course is designed as an opportunity for students to learn about the relationship between nonprofit and for-profit organizations, about individual and corporate philanthropy, and possibly to take part in a philanthropic experience.

MGMT 4073 Management and Ethical Leadership. This course focuses on the application and evaluation of real-life ethical dilemmas using ethical decision-making models. Students will evaluate personal value systems, individual, leadership driven, organizational, and community ethical issues. Students may not take both MGMT 4073 and MGMT 5073* for credit.

MGMT 4083* Corporate and Social Responsibility. Prerequisite(s): 3013. Management of situations to minimize adverse consequences and serve an organization's best interests.

MGMT 4089 Management of Non-Profit Organizations. Students will be introduced to the role of non-profits in the economy including management systems, strategy, and the interface between non-profits, other businesses and various stakeholders. Students may not take both MGMT 4093 and MGMT 5093* for credit.

MGMT 4123 Labor Management Relations. Prerequisite(s): 3013. Labor relations and collective bargaining. Negotiation and administration of labor agreements and employee relations in non-union organizations. Modes of impasse resolution.

MGMT 4133 Total Rewards. Prerequisite(s): MGMT 3313 and (STAT 3013 or PSYC 3214 or MGMT 3513). Introductory course. Fundamentals of compensation such as the legislative environment, compensation theories, job analysis, job evaluation, wage structures and indirect compensation programs.

MGMT 4143 Preventive Stress Management. Prerequisite(s): 3013. Manage to promote eustress (positive stress) and prevent or resolve distress (negative stress) in organizations. Psychophysiology of the stress response and the individual and organizational costs of distress. The principles and methods of preventive stress management.

MGMT 4153 Talent Development. Prerequisite(s): MGMT 3313 and (STAT 3013 or PSYC 3214 or MGMT 3513). The role of training and development in organizational sustainability and competitiveness is examined. Topics include assessing training needs, developing and delivering training, evaluating training effectiveness, and career development. Students develop a training program and trainer skills.

MGMT 4163 Fundraising for Non-Profits. Students will be introduced to the theory and practice of raising external funding for social causes. Courses may include exposure to exposure to non-profits and non-profit organizations. (Students cannot concurrently enroll in MGMT 4163 and MGMT 5163*).

MGMT 4213 (D) Managing Diversity in the Workplace. The American workforce is becoming increasingly more diverse. Successful leaders need to be able to interact with a wide-range of individuals. In this class, students will explore how managers build a successful organization by embracing diversity.

MGMT 4313 Organization for Action. Prerequisite(s): 3013. A behavioral approach to the study of inter-organizational processes and the implementation strategies of firms. Building on Strategic Management and Human Resource Management, from the behavioral science, the study of the cognitive, social, cultural, and political aspects of strategy implementation in simple and complex organizations.

MGMT 4403 Environmental Sustainability for Business. The course reviews human-nature relationships and how they affect the ability of future generations to sustainably improve their quality of life. The course also considers methods of environmental stewardship that can contribute to sustainability. In-class and/or online discussions of issues, guest presentations by outside experts, and reports on selected topics are included.

MGMT 4413 Change Management. Prerequisite(s): 3013. Managing organizational change and redesign. The study of organizational change processes and the enhancement of performance through change management. Study of the body of knowledge and applications in this branch of organizational science.

MGMT 4423 Environmental Problem Analysis for Business. This course explores methods of analyzing sustainable solutions to complex environmental, safety and health problems using an integrated team approach. This approach combines technical, legal, economic, and sociopolitical information into a coherent analytical framework.

MGMT 4433 Industrial Ecology for Business. Provides students with an overview and broad understanding of ecology principles as applied to an industrial setting. The course begins with an overview of general ecological principles such as ecosystem theory and various components, energy flows, and properties of populations. The course concludes with a consideration of industrial ecology principles such as sustainability, pollution prevention, life cycle assessment and waste minimization.

MGMT 4493 Applied Environmental Standards for Business Managers. Foundational understanding of the complex regulatory framework related to waste management.
MGMT 4513 Strategic Management. Prerequisite(s): Senior standing or business core classes. Builds on concepts from business core courses to explain the upper management tasks of formulating and implementing strategies that increase organizational performance. Teaching methods may include case analysis and business simulation.

MGMT 4533 Leadership Dynamics. Prerequisite(s): MGMT 3013. The challenges of leadership require management of the highest order. Students will learn about the latest developments in leadership theory and research. Students will also gain experience in putting into action the concepts learned in this class.

MGMT 4573 Managerial Decision Making. Prerequisite(s): 3013. The goal of this course is to help students become more effective decision-makers. It attempts to provide an understanding of decision-making at two levels - the individual and the group. It examines the mechanisms that underlie decision choices, preferences, and judgments, and through this examination, attempt to discuss how to improve decisions.

MGMT 4613 (I) International Management. Prerequisite(s): 3013 or 3123. 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.

MGMT 4623* Small Business Management. Prerequisite(s): 3013 or 3123. Starting and managing a small business.

MGMT 4650 Leadership Issues. 1-6 credits, max 9. Prerequisite(s): 3013. Examination of leadership issues. Specific topics vary from semester to semester.

MGMT 4693* International Human Resource Management. Prerequisite(s): 3013 required, 3133 preferred and LSB 4423 recommended. A comparison of human resource management policies and practices in the United States with those of major U.S. trading partners. Major human resource functions such as planning, staffing, training, compensation, performance appraisal and labor relations. Human resource policies and practices of China, Japan, Mexico, Canada and other countries.


MGMT 4743 Advanced Sports Management. Prerequisite(s): 3943. This course builds on the material covered in MGMT 3943. More in-depth coverage is given to topics selected and applied to managing sport industry.

MGMT 4750 International Leadership Experience. 3 credits, max 6. This course focuses on developing leadership skills through international travel. Students will learn the skills and values used by leaders in other countries. The cultural and business environment faced by leaders in other countries will also be explored.

MGMT 4813* Talent Acquisition. Prerequisite(s): MGMT 3313 and (STAT 3013 or PSYC 3214 or MGMT 3513). Theories and methods of recruiting and selecting employees. Job analysis, human resource planning, recruiting, employment laws, and staffing. Staffing methods such as interviews, references, application blanks, cognitive ability and personality tests and others. Development and critique of a selection plan and conduct of a behavioral interview.

MGMT 4843 Strategic Sport Management. Prerequisite(s): 3943. An in-depth analysis and review of revenue generation in the sport industry. Topics will include past and present examples from many different types of sports, both in the United States and internationally. Revenue generation strategies will be discussed in terms of management planning and decision making.

MGMT 4850 Applied Leadership Studies. 1-6 credits, max 6. Prerequisite(s): 3013. Structured internship of field project with supporting academic study.

MGMT 4883 (I) Multiple Perspectives in Global Management. Prerequisite(s): 3013 or 3123. View of how multinational corporations and cross-border business transactions have an impact on countries, cultures, employees, and ecological systems. The border business transactions have an impact on countries, cultures, employees, and ecological systems.

MGMT 4893 (I) International Sports Management. A broad overview of the industry of sports around the globe. The historical, political, cultural, and business influences of sport development and management across the world will be discussed. The similarities and differences in organizational and management strategy from various countries, regions, and continents will also be examined.

MGMT 5011* Crucial Interactions. Examines methods for increasing positive communication between you and organizational members. Crucial conversations are those conversations that we must have. Ways to increase the frequency of dialogue to maximize benefit from a crucial conversation are discussed. No credit for students with credit in 4011.

MGMT 5021* Managing Professional Relationships. The study of political behaviors and ways to use them effectively in order to be successful in your career. Ways to be prepared for political dynamics at work and what you can do to emerge a winner will be discussed. No credit for students with credit in 4021.

MGMT 5023* Management of Sustainable Enterprises. Students will be introduced to the social and natural environments and threats to sustainability. The course will cover the external drivers of sustainability as well as internal responses to these pressures. Students may not take both MGMT 3023 and MGMT 5023* for credit.

MGMT 5031* Leading Organizational Change. An introduction to ways of leading change in an organization to keep pace with the economy and the competition. Building an eight step process for developing, selling and implementing change initiatives. No credit for students with credit in 4031.

MGMT 5041* Performance Management. A study of the role of a performance management (PM) system in an organization, the basic components of a PM system (standards, measurement, judgment and action), PM methods and performance management interviews and the Balanced Scorecard. No credit for students with credit in 4041.

MGMT 5051* Creating Ethical Work Places. An examination of the meaning of ethics in business and human resource management, how ethical, work-related behaviors can be maximized, and how ethical organizational cultures facilitate organizational effectiveness. Establishing and critiquing an ethics program and examining your own code of ethics. No credit for students with credit in 4051.

MGMT 5061 Managing Confrontations. Crucial confrontations directly address gaps between expectations and performance with a model that ensures individual and team effectiveness. Learn to hold people accountable, master face-to-face performance discussions, motivate without using power, enable without taking over, and move to action. It will improve the quality of your life and of your organization. No credit for students with credit in 4061.

MGMT 5073* Management and Ethical Leadership. This course focuses on the application and evaluation of real-life ethical dilemmas using ethical decision-making models. Students will evaluate personal value systems, individual, leadership driven, organizational, and community ethical issues. Students may not take both MGMT 4073 and MGMT 5073* for credit.

MGMT 5083* Corporate and Social Responsibility. Ethics and decision-making in corporations. Students will be exposed to managerial responsibility as well as social responsibility at the corporate level. Students may not take both MGMT 4083 and MGMT 5083* for credit.

MGMT 5093* Management of Non-Profit Organizations. Students will be introduced to the role of non-profits in the economy including management systems, strategy, and the interface between non-profits, other businesses and various stakeholders. Students may not take both MGMT 4093 and MGMT 5093* for credit.

MGMT 5113 Management and Organization Theory. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Contemporary theories often related to managerial responsibility and organizational goals and environments.

MGMT 5123* Contemporary Management Topics. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Examination of selected topics representing the most current management theories and practices.

MGMT 5133* Total Rewards. This course covers the development, implementation, and evaluation of compensation and benefits policies/programs. Students will learn the underlying theory as well as complete projects deemed necessary to master this material. Additionally, content will be provided to cover the legal environment, governing total rewards programs, administrative functions, and total rewards programs.


MGMT 5163* Fundraising for Non-Profits. Students will be introduced to the theory and practice of raising external funding for social causes. Course may include exposure external speakers and non-profit executives.

MGMT 5213* Seminar in Organizational Behavior. Prerequisite(s): Admission to MBA program or consent of MBA director. Current research on group behavior in organizations. Group processes and structural factors affecting the interaction process and intra- and intergroup performance characteristics. Laboratory simulation and team research projects used to pursue advanced topics.

MGMT 5223* Seminar in Human Resource Management. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Principles, theories and methods of human resource management applied to various types of organizations. Human resource functions of planning, staffing, training and development, performance management, compensation and benefits, safety and health, and labor relations.

MGMT 5303* Corporate and Business Strategy. Prerequisite(s): FIN 5053 or concurrent enrollment. Key issues in formulating and implementing business and corporate strategies. The orientation of top management and diagnosis of what is critical in complex business situations and realistic solutions to strategic and organizational problems.

MGMT 5313* Project Management. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. The processes and techniques of managing projects in today's business world. The processes of idea generation, needs analysis, implementation, evaluation, and learning. The techniques of team building and conflict resolution including stakeholder analysis.

MGMT 5323* Teams in Organizations. Prerequisite(s): 5113, admission to MBA program or consent of MBA director. The different ways in which teams are formed and managed in organizations. Focus on selected topics related to managing a sports entity.
MGMT 5443* Building the Effective Organization. Prerequisite(s): 5113, 5513 (concurrent enrollment). The steps involved in building a small to mid-sized business into a well-run organization.

MGMT 5453* Technology Commercialization. Prerequisite(s): Admission to MBA program or consent of MBA director. The steps involved in evaluating and commercializing new technologies. The necessary steps in moving from prototypes to product.

MGMT 5500* Special Projects in Management. 1-6 credits, max. 9. Structured internship, academic project, or field project on a management topic under the direction of a faculty member.

MGMT 5523* Human Resource Analytics. Topics include: research methods, psychometrics, descriptive statistics, inferential statistics, correlation, linear prediction, and other methods as deemed necessary by the instructor. Students will show competence in proper data collection and evaluation techniques, as well as skills necessary to write up and present quantitative findings. Students will apply these concepts practically over the course of the semester and will be expected to develop their own data sets for analysis.

MGMT 5533* Leadership Challenges. Prerequisite(s): 5113, admission to MBA program or consent of MBA director. Contemporary leadership practices. Leadership as a behavior, not as a position. The challenges of leadership, regardless of position.

MGMT 5553* Management of Technology and Innovation. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. 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 technological knowhow and strategic management of technology and innovation.

MGMT 5563* Crisis in Organizations. Prerequisite(s): 5113, admission to MBA program or consent of the MBA director. Management and leadership in the face of crisis, from the smallest mom and pop store to the largest multinational corporation.

MGMT 5613* Business Opportunity Identification and Analysis. Prerequisite(s): Admission to MBA program or consent of MBA director. The techniques required for locating business opportunities, assessing their feasibility, and evaluating their potential returns.

MGMT 5643* Sport Management. Designed to give the student an understanding of the basic management skills necessary in the operation of sport organizations. Topics include the social, behavioral, and managerial foundations of sport management, public relations, finance, economics, and budgeting in the sport industry, and managing a sports facility.

MGMT 5673* Advanced Sport Management. Builds on the material covered in 5643. More in-depth coverage is given to selected topics related to managing a sports entity.

MGMT 5713* Negotiation and Third-Party Dispute Resolution. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. This course is designed to improve students' personal effectiveness and increase their productivity by drawing on the latest research in the psychology of judgment, decision making, and the art of negotiation and decision-making. Students learn to develop effective strategies and systematic approaches to negotiations and influence opportunities.

MGMT 5743* International Negotiations. Prerequisite(s): Admission to MBA program or consent of MBA director. Improvement of negotiation skills and learn how cultural and national issues affect negotiations.

MGMT 5750* International Leadership Experience. Prerequisite(s): 3 credits, max. 6. This course focuses on developing leadership skills through international travel. Students will learn the skills and values used by leaders in other countries. The cultural and business environment faced by leaders in other countries will also be explored.

MGMT 5800* Special Topics in Management. 1-6 credits, max. 9. Exploration of emerging management topics. Specific topics will vary from semester to semester.

MGMT 5823* Talent Acquisition. This course focuses on the process of talent acquisition. Course topics include: human resource planning, position analysis, recruitment, selection, employment offers, and verification procedures. Students will study underlying human resource management theory and complete projects deemed necessary for mastery of the material. The course will also cover material related to the development, implementation, and evaluation of selection systems and the legal environment as it pertains to talent acquisition. Related topics will be discussed at the discretion of the instructor.

MGMT 5843* Advanced Strategic Sports Management. Brand management in collegiate sports, the role of collegiate athletics in higher education in the United States, brand management in sports merchandising and entertainment, stadium financing and politics, franchise movement, legal cases, biographical stories, and the role of sports and tourism.

MGMT 5943* Advanced International Sports Management. Historical, political, cultural, and business influences of sport development and management across the world. Emphasis on similarities and differences in organizational and management strategy form various countries, regions and continents.

MGMT 6313* Advanced Organizational Behavior. Prerequisite(s): Doctoral student 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.

MGMT 6323* Advanced Strategic Management. Prerequisite(s): Doctoral student standing and consent of instructor. Research concerning the content of organizational strategy and the process through which it is formulated and implemented.

MGMT 6333* MESO Organization Studies. Prerequisite(s): Doctoral student standing and consent of instructor. Integration of macro- and micro-level concepts and topics across individual, group and organizational levels of analysis. Work and organization design, teams and groups, decision-making, and conflict management.

MGMT 6434* Contemporary Research in Management I. Prerequisite(s): Doctoral student standing and consent of instructor. Introduction to the research process in management and building a career as a management scholar.

MGMT 6535* Advanced Methods in Management Research. Prerequisite(s): Doctoral student standing 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 testing to be, and design research study using various methodologies. (Same course as BADM 6353)

MGMT 6563* Advanced Organizational Theory. Advanced organization theory in the field of management research. Analysis of key theoretical perspectives and management and related disciplines.

MGMT 6443* Contemporary Research in Management II. Prerequisite(s): Doctoral student standing and consent of instructor. Specialized contemporary topics in management for doctoral students.

MGMT 6453* Advanced Measurement in Management Research. Scale transformations, test construction, scale development, item analysis, reliability testing, validity, EFA/CFA, and regression and endogeneity.

MGMT 6553* Structural Equation Modeling Applications in Business. Prerequisite(s): Doctoral student standing and consent of instructor. Conceptual and statistical underpinnings of structural equation modeling and application to organizational and business research including measurement development and model testing. Recent advances in this technique. Hands-on experience with structural equation modeling software.

Management Science and Information Systems (MSIS)

MSIS 2103 Business Computer Concepts and Applications. Lab 2 concepts for the design, operation, and use of computer information systems in organizations, including fundamentals of key information technologies, information assurance, and the use of personal computing applications to support problem-solving. Lab-based computer training in fundamental productivity software and Internet tools.

MSIS 2203 Computer Programming for Business. Prerequisite(s): 2103 or equivalent. Computer programming for organizations from the perspective of Integrating the Internet into business information systems. Fundamental principles and constructs of programming and applied programming in the business environment.

MSIS 3023 (D) Technology, Diversity and Entrepreneurship. Prerequisite(s): 2103 or consent of instructor. A study of technology, diversity and entrepreneurship. The use of technology as a research tool to study diversity and the opportunities available to diverse groups through entrepreneurship.

MSIS 3103 End User Database Systems Design and Management. Prerequisite(s): 2103 and Non-MIS (or CS) majors only. Use of computer technology and software to represent, manipulate and manage data. Principles and techniques of logical database design and related database concepts. Analysis, design and implementation of a database system using a relational DBMS. No credit for students in the MIS major.

MSIS 3123 Information Assurance Management. A broad investigation of the elements of information assurance and security with an emphasis on the management impact to corporations and businesses engaged in the information services and e-commerce. Students should come away from the course with the ability to advise management on the risks and mitigation for all types of threats to information and privacy.

MSIS 3153 (I) International Telecommunications Business Environment. Prerequisite(s): MSIS 2103 or consent of instructor. Focuses on understanding the implications and challenges of utilizing telecommunications networks in today's global business environment. Emphasis will be placed on identifying the major players in the global information infrastructure, standards setting bodies and procedures, and the various regulatory processes encountered. Students will research the telecommunications industry in other countries and develop comprehensive written reports.

MSIS 3203 Advanced Computer Programming for Business. Prerequisite(s): 2203. Advanced programming features are examined with an emphasis on the
development of computer programs for business applications.

MSIS 3223 Operations Analytics. Prerequisite(s): MSIS 2103, STAT 2023 and MATH 2013 or equivalent. Examination of analytic approaches used in managing processes that provide services or produce products. Analytic approaches include forecasting, optimization, decision analysis, among others. The analytics support decision making related to location analysis, project management, inventory management, among other areas.

MSIS 3233 Management Science Prescriptive Analytics. Prerequisite(s): MSIS 3223. Prescriptive analytics applied to resource allocation and operational problems encountered in accounting, economics, finance, management and marketing. Linear programming, goal programming, integer programming, and network models.

MSIS 3243 Managerial Decision Theory. Prerequisite(s): 3223 and calculus. Decision processes under risk and uncertainty. The use of models in business decision-making with outcomes governed by probability distributions. Bayesian decision analysis, utility measurements, game theory, Markov chains, queueing theory, simulation, and inventory models.

MSIS 3333 Database Systems Design, Management and Administration. Prerequisite(s): 2203 and MIS or CS or ACCT majors only. Extensive data modeling implemented and queried using SQL, DDL, and DML. Data integrity and accessibility in a shared network environment. Related database concepts including data warehousing, database security, data and database administration. Required for MIS majors.

MSIS 3363 Advanced Management Information Systems Programming. Prerequisite(s): 2203 or equivalent. Programming tools with applications in industry. Advanced programming procedures, processes and algorithms.

MSIS 3393 Advanced Spreadsheet Modeling and Programming. Prerequisite(s): 2103 and permission of instructor. This class provides students with advanced spreadsheet skills, including the ability to formulate math programming models, simulations, risk analysis, and other business decision-making tools. The class will also provide students with an introduction to spreadsheet programming (VB, macros, etc.), building decision support systems in spreadsheets, etc.

MSIS 3931 (D) Diversity Impacts in Information Systems. Critical analysis of the impact of technology on socially-defined classifications such as race, ethnicity, age, gender, sexuality, and disability; and how those groups affect technology industry. Through reading, observation, discussion, and writing, students will have their own perceptions challenged to better understand technology interaction through and with diverse populations, and how relationships between those groups may be improved or worsened as a result of mediated communication. Collection and numerical analysis of associated data model validation and verification, model sustainability, and understanding of simulation as a useful tool in management science and information systems.


MSIS 4010 Applied Management Science and Information System Studies. 1-6 credits, max 6. Prerequisite(s): Consent of department head and MSIS majors only. Structured internship, field study or independent project with supporting academic study.

MSIS 4020 Applications Software Tools and Techniques. 1-3 credits, max 3. Prerequisite(s): 3303, 2203, permission of instructor. Hands-on experience with selected software-based tool or programming languages such as SAP, SQL, PERT/CPM, etc.

MSIS 4033 Information Systems Project Management and Communication. Prerequisite(s): 2103. This class discusses the multi-faceted dimension critical to successfully leading information systems projects. Topics will include behavioral, strategic, technical, quantitative and communications issues faced by those directing projects.


MSIS 4133 Information Technologies for Electronic Commerce. Prerequisite(s): 4003. The Internet and web-based technologies, systems and applications that allow organizations to overcome the barriers of time and distance for conducting commerce. Scripting and markup languages, web programming tools, and the connectivity technologies for designing and developing electronic commerce and systems.

MSIS 4233 Applied Information Systems Security. Prerequisite(s): 3123, 4523. An investigation of the various techniques for protecting against attacks and failures in various types of information systems. Course content may vary but will generally include computer, network, and data protection technologies (e.g. firewalls, packet filters, proxy servers, user authentication and validation techniques, encryption, backup methodologies, system and component redundancies, etc.). Various threats and attack methods will be examined.


MSIS 4253 System Certification and Accreditation. Prerequisite(s): 3123. Introduction to the certification and accreditation process. Risk analysis, system security analysis, and other topics.

MSIS 4263 Decision Support and Business Intelligence Applications. Prerequisite(s): 2103. Applied knowledge management tools and techniques for organizational decision support. Knowledge-based systems, decision support systems, and data mining techniques such as inductive learning and neural networks.

MSIS 4273 Legal and Ethical Issues in Information Systems. Prerequisite(s): 3123. Reviews the current status of information systems law in regard to rights of privacy, freedom of information, confidentiality, work product and protection, copyright, security, legal liability, ethical issues, and a range of additional legal and information policy topics. Investigates the legal difficulties that technological innovations are causing in all of these areas. Legal options for dealing with the conflicts caused by technological change and likely adaptations of the law over time in response to societal changes will be explored.


MSIS 4363* Web Application Development. Prerequisite(s): 4003. Develop next-generation, data driven web applications involving database development, server-side business logic, and advanced user interface design.

MSIS 4373* Advanced Topics in Management Information Systems. Prerequisite(s): Senior standing and consent of instructor. Current and emerging advanced topics in the field of management information systems. Advanced network management, advanced electronic commerce issues, international management information systems and legal and regulatory issues in telecommunications.

MSIS 4443* Introduction to Business Dynamics. Prerequisite(s): 2103 and 3223 and STAT 2023. Simulation modeling of business systems, such as inventory, financial management, data communications, information system problems, or other decision-making problems. Collection and numerical analysis of associated data model verification and validation, model sustainability, and understanding of simulation as a useful tool in management science and information systems.

MSIS 4523* Data Communication Systems. Prerequisite(s): 2103. Broad range of network technologies used to drive data and voice needs of today’s business. Network vocabulary and the understanding of how telecommunications components function are stressed.

MSIS 4943 Decision-Making Tools for Sports Management. Prerequisite(s): 3223. This course is designed as an elective for MGMT students enrolled in the Sports Management option. Useful decision tools such as statistical inference, decision analysis, mathematical programming, forecasting and simulation are used to address decisions faced by sports administrators and decisions made during sporting contests. Current ‘hot’ issues in sports decision-making will also be examined.

MSIS 5020* Advanced Applications Software Tools. 1-3 credits, max 3. Advanced hands-on experience with selected software-based tool or programming languages such as SAP, SQL, PERT/CPM, etc. For graduate credit only.

MSIS 5033* Information Systems Project Management. Prerequisite(s): Consent of MS in MIS director, MSTM director or MBA director. This class covers the important multi-faceted dimensions of directing and leading information systems projects. Topics will include behavioral, strategic, technical and quantitative issues faced by information system project teams.

MSIS 5123* Enterprise Resource Planning. Prerequisite(s): Admission to a graduate program. Challenges of data integration and redesign of processes in organizations. Introduction to enterprise resource planning (ERP) concepts, software, and practices. ERP issues architecture, planning, design, implementation, and project management. Extensions of ERP Technologies for managing supply chains and other relationships. Emerging trends.

MSIS 5133* Advanced Web Based Application Development. Prerequisite(s): Admission to MBA, MSTM, or MS in MIS program, a programming object-oriented language and 5643 or instructor consent. Development of n-tier web-based applications, including concepts and technologies relating to the presentation, business, and data tiers. Technologies include (but are not limited to) browser and other client programming, server-side programming, data tier programming and XML technologies.

MSIS 5213* Information Assurance Management. A broad investigation of the elements of information assurance and security with an emphasis on the management impact to corporations and businesses engaged in information.
services and electronic commerce. Students should come away from the course with the ability to advise management on the risks and mitigation for all types of threats to information and privacy.

**MSIS 5223** Object-Oriented Programming Applications for Business. Prerequisite(s): MSIS 5643, graduate standing and computer programming proficiency; or consent of MS in MIS director. Object-oriented programming concepts and applications for business in a global environment through an appropriate object-oriented programming language. Previously offered as MSIS 5023.

**MSIS 5233** Applied Information Systems Security. Prerequisite(s): MSIS 5223. An investigation into the various technical aspects of protecting, and guarding against attacks and failures in various types of information systems. Course content may vary but includes computer, network, and data protection technologies (e.g., firewalls, packet filters, proxy servers, user authentication and validation techniques, encryption, backup methodologies, system and component redundancies, etc.). Various threats and attack methods examined.

**MSIS 5243** Information Technology Forensics. Prerequisite(s): MSIS 5223. Review of systems for vulnerabilities and analysis of systems that have been breached. This course will cover the many related issues and have a heavy hands-on component.

**MSIS 5253** Advanced System Certification and Accreditation. Prerequisite(s): MSIS 5223. An investigation into the various technical aspects of attacking, and guarding against attacks and failures in various types of information systems. Course content may vary but includes computer, network, and data protection technologies (e.g., firewalls, packet filters, proxy servers, user authentication and validation techniques, encryption, backup methodologies, system and component redundancies, etc.). Various attacks and attack methods examined.

**MSIS 5263** Information Assurance Offense. Prerequisite(s): MSIS 5223, MSIS 5233 and graduate coordinator permission. Learning successful computer attacks so as to recognize and apply appropriate security controls for system vulnerabilities.

**MSIS 5273** Legal and Ethical Issues in Information Technology. This course reviews the current status of information systems law in regard to rights of privacy, freedom of information, confidentiality, work product protection, copyright, security, legal liability, ethical issues and a range of additional legal and information policy topics.

**MSIS 5283** Secure Information Systems Administration. Prerequisite(s): MSIS 5223 and coordinator permission. Introduction to basic concepts and technologies relevant to secure information systems administration. The topics covered in this course include, but are not limited to, operating system (OS) hardening, securing servers, network protection, and various access control mechanisms.

**MSIS 5293** Information Assurance Capstone. Prerequisite(s): Final semester in program; graduate coordinator permission. This capstone course takes a strategic view of corporate information assurance. The goal is to provide an overarching view of an information assurance program to include physical, personnel, cyber security, and cyber security, including the underlying legislation and Federal and state regulations that drive corporate IA programs and policy.

**MSIS 5303** Prescriptive Analytics. Prerequisite(s): Admission to a SSB graduate program. Application of prescriptive analytic techniques to business problems. Some descriptive analytics may also be covered.

**MSIS 5313** Production Operations Management. Prerequisite(s): Admission to MBA program or consent of MBA director. The management of operations in manufacturing and service organizations. Production planning, facility location and layouts. Inventory control, waiting line problems and simulation. Project management and quality control. Emphasis is on a management science approach.

**MSIS 5323** Advanced Spreadsheet Modeling. Advanced spreadsheet modeling skills critical to business problem solving. Presentation, analysis, solution and communication facets are emphasized.

**MSIS 5410** Advanced Topics in Information Assurance. Prerequisite(s): Graduate standing and consent of program director. Advanced topics in information assurance and security.

**MSIS 5413** Advanced Management Science. Prerequisite(s): Admission to MBA program or consent of MBA director. Advanced management science methods, with computer applications. Mathematical programming, simulation, forecasting, queueing, Markov processes.

**MSIS 5600** Special Projects in Business Information Systems. 1-6 credits, max 6. Prerequisite(s): Consent of MS in MIS director. Study of advanced topics not covered directly in courses in the field. For graduate students and others who wish to study a specific topic in greater depth.

**MSIS 5613** Advanced Production and Operations Management. Prerequisite(s): 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.

**MSIS 5623** Information and Network Technology Management. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Major principles and impact of information technology from a manager’s perspective in relation to the operation and success of businesses in today’s global digital economy. Topics include the internet, networks and wireless systems, database management systems, decision support systems, social media and e-business applications.

**MSIS 5633** Business Intelligence Tools and Techniques. Prerequisite(s): Admission to MBA, MSTM, or MS in MIS program or consent of instructor. A comprehensive analysis of contemporary business intelligence tools and techniques used in management, analytics, decision support systems and other techniques. Data and text mining, knowledge management, expert systems, neural networks, and other tools and techniques.

**MSIS 5643** Advanced Database Management. Prerequisite(s): Admission to MBA, MSTM or MS in MIS program or consent of instructor. Advanced theoretical and practical applications of database systems. Brief review of classical issues surrounding design, analysis, and implementation of databases. Overview and use of modern database systems. Current and emerging issues in the database field.

**MSIS 5653** Advanced Systems Analysis and Design. Prerequisite(s): Consent of MS in MIS director, MSTM director or MBA director. Systems thinking. Systems life cycle, modeling approaches, methods, tools, and techniques of systems analysis and design for the development of modern organizational information systems.

**MSIS 5663** Data Warehousing. Prerequisite(s): MSIS 5643. Provides an introduction of the major activities involved in a data warehousing project. These activities include understanding fundamental principles and concepts, design principles, data warehouse prototype development, including table definitions, extract/transfer/load (ETL) logic, and example report definitions. The class will include hands-on component.

**MSIS 5673** Descriptive Analytics and Visualization. This course will provide an understanding of the role of descriptive analytics, visualization, and dashboarding in support of managerial decision making (business intelligence and analytics). Specifically, knowledge about managerial decision making, business intelligence analytic capabilities, and how they relate to other types of information systems; knowledge about human visual processing in relation to data presentation; knowledge of dashboard design and management; and knowledge about software packages and hands-on capabilities.

**MSIS 5683** Big Data Advanced Analytics Technologies. Prerequisite(s): MSIS 5633. The astounding growth of data in all aspects of life in the form of emails, weblogs, tweets, sensors, video and text has necessitated the use of Big Data and advanced analytics techniques to support large scale data analytics. This brings together key Big Data tools on a Hadoop platform to show how to efficiently manage data with three main characteristics: volume, velocity and variety. Topics include the Hadoop platform, social media analytics, link analysis, and stream analytics.

**MSIS 5773** The Upper Layers of Telecommunications Systems. Applied technical coverage of selected topics from the upper layers of the OSI model. Network and Transport layers using, TCP/IP, IPX/SPX, as well as security issues and other multi-layer protocol suites. Other topics include flow control, RSVP, encryption, compression, and LAN/WAN applications.

**MSIS 5900** Practicum in Management Information Systems. 1-6 credits, max 6. Prerequisite(s): Consent of director of and admission to the MS in MIS program. Application of MIS-related methods and skills in a business environment. Integration of knowledge through real-world problem solving situations in organizational contexts.

**MSIS 5990** Directed Studies in Information Assurance. 1-6 credits, max 6. Prerequisite(s): Graduate standing and consent of program director. Special advanced topics, projects and independent study in information assurance and security.

**MSIS 6200** Advanced Topics in Management Information Systems. 3-6 credits, max 12. Prerequisite(s): Doctoral student status and consent of instructor. Special advanced topics in management information systems for doctoral students.

**MSIS 6300** Contemporary Topics in MIS Research. 1-6 credits, max 6. Prerequisite(s): Doctoral standing. In-depth study in one or more topics in the MIS field. An ongoing conversation about major issues in the field. Topics related to any one of the areas within the broad, interdisciplinary field of management science and information systems, such as management information systems, management science, telecommunications, and operations management.

**MSIS 6333** Overview of MIS Research. Prerequisite(s): Doctoral standing. Research in the field of Management Information Systems (MIS) is research that studies and explores the management of information technology within organizations. It examines the role of information technology in organizations and the impact it has on business processes, strategy, and decision-making. This course addresses the current landscape of MIS research, with a focus on the various research methods and tools used in the field. Topics include the role of MIS in strategic decision-making, the impact of technology on organizational structures, and the importance of data analytics and big data in modern organizations.
Marketing (MKTG)

MKTG 3213 Marketing. Prerequisite(s): Minimum of 45 credit hours. Marketing strategy and decision-making. Consumer behavior, marketing institutions, competition and law.

MKTG 3263 Entrepreneurial Marketing. Prerequisite(s): EEE 3023, MKTG 3213 and completion of business core classes or instructor permission. Examination of the roles of marketing in entrepreneurial ventures and entrepreneurship in the marketing efforts of any organization. Emphasis on marketing as it relates to marketing management, resource leveraging and guerrilla approaches. No credit for students with credit in EEE 5223 or MKTG 5223. (Same course as EEE 3263)

MKTG 3313 Personal Marketing and Professional Development. The purposes of this course are (1) to provide an understanding of the role of marketing as applied to the individual student and (2) to provide students with basic skills necessary for a successful business career. The course will make extensive use of outside speakers (e.g., professional trainers, alumni, recruiters, professors) covering a broad range of topics. In addition, the course will have a strong experiential dimension (both within and outside the classroom).

MKTG 3323 Consumer and Market Behavior. Prerequisite(s): 3213. Qualitative and quantitative analyses of the behavior of consumers, a marketing consideration of the contributions of economics and the behavioral disciplines to consumer behavior.

MKTG 3333 Nonprofit Marketing. Prerequisite(s): 3213. Applied marketing knowledge with attention given to those concepts and methods used in nonprofit marketing.

MKTG 3433 Promotional Strategy. Prerequisite(s): 3213. Promotional policies and techniques and their application to selling problems of the firm.

MKTG 3473 Professional Selling. Prerequisite(s): 3213. Skills to understanding the professional personal selling process. Strong emphasis on the communications function of personal selling. Lecture sessions combined with experiential exercises and role playing.

MKTG 3511 Sales Practicum. Prerequisite(s): 3213, 3511 or concurrent enrollment in MKTG 3513. Students use their work experience, and other resources, to gain a practical understanding of sales marketing. Students must have a sales position (paid or volunteer) where they work at least 100 hours over the course of the semester.

MKTG 3513 Sales Management. Prerequisite(s): 3213. Sales planning and control, organization of the sales department, developing territories, motivating salespersons and control over sales operations.

MKTG 3611 Retailing Practicum. Prerequisite(s): 3213, 3613 or concurrent enrollment in MKTG 3613. Students use their work experience, and other resources, to gain a practical understanding of retail marketing. Students must have a retail position (paid or volunteer) where they work at least 100 hours over the course of the semester.

MKTG 3613 Retailing Management. Prerequisite(s): 3213. Applied marketing knowledge, with attention given to those concepts and methods which provide the needed foundation for a retailing manager.

MKTG 3713 Sports Marketing. Prerequisite(s): 3213, 3323 and 3433. Applied marketing knowledge with attention given to those concepts and methods used in sports marketing.

MKTG 3813 Business to Business Marketing Management. Prerequisite(s): 3213. A strategic overview of the marketing of products and services to business, government, and not-for-profit organizations.


MKTG 4223 Supply Chain Management. Prerequisite(s): 3213. An economic and operational analysis of the physical flow of goods and materials. A system interpretation of marketing channels.

MKTG 4333 Marketing Research. Prerequisite(s): 3213, 3323; STAT 2023. Basic research concepts and methods. Qualitative and quantitative tools of the market researcher.

MKTG 4343 Brand Marketing. Prerequisite(s): 3213 and 3323. Examines the broad topic of brand marketing. Consumers, competitors, the media, and the government all focus on the brand as the basic unit of marketing. Thus some of the most important and exciting elements of modern business involve conceiving, building, and marketing the brand. Important issues such as building and measuring brand equity, brand positioning, brand names and logos, and global branding will be discussed.

MKTG 4443 Social Issues in the Marketing Environment. Prerequisite(s): 3213. Social and legislative considerations as they relate to the marketplace.

MKTG 4550 Problems in Marketing. 1-9 credits, max 9. Prerequisite(s): 3213. Problems in marketing. Specific topics vary from semester to semester.

MKTG 4553 International Marketing. Prerequisite(s): 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.

MKTG 4683 Managerial Strategies in Marketing. Prerequisite(s): MKTG 3123, MKTG 3523 and a minimum of nine credit hours in MKTG, ACCT 2103 and ECON 2203, LSB 3213, MGMT 3013, MSIS 2103. Analysis of the marketing management decision process; marketing opportunity analysis, strategy development, planning and integration with corporate strategy. Students may not take both MKTG 4683 and MKTG 4693 for degree credit.

MKTG 4693 Managerial Strategy and Customer-Employee Interactions. Prerequisite(s): MKTG 3213, MKTG 3323 and a minimum of nine credit hours in MKTG, ACCT 2103 and ECON 2203, LSB 3213; Requires consent of department to enroll. Analysis of the marketing management decision process with respect to the customer-employee interface; management of frontline employees; marketing opportunity analysis, strategy development, planning and integration with corporate strategy. Students may not take both MKTG 4683 and MKTG 4693 for degree credit.

MKTG 4773 Services Marketing. Prerequisite(s): 3213. Conceptual and managerial tools for students who intend to be involved with the marketing of services. Characteristics of services, listening to customers, managing customer expectations, conceiving and creating service breakthroughs, service quality, positioning of services, managing demand and supply, creating a strategic service vision and designing a customer focused organization to create and retain customers.

MKTG 4850 Applied Marketing Studies. 1-6 credits, max 6. Prerequisite(s): 12 credit hours of marketing and consent of instructor. Structured internship or field project with supporting academic study.

MKTG 4973 New Product Development. Prerequisite(s): 3213, 4333. The elements involved in creating and marketing a successful new product. Qualitative and quantitative methods will analyze data collected from focus groups, including surveys to test a new product concept.

MKTG 4983 Database Marketing. Prerequisite(s): 3213, 3323, MKTG 2103 or consent of instructor. An information-driven process to develop, test, implement, measure, and adopt customized marketing programs and strategies.

MKTG 4993 Electronic Commerce Marketing. Prerequisite(s): 3213, 3433, MSIS 2103 or consent of instructor. Digital interactive tools changing the management of the markets. The development and impact of electronic commerce on business and use of interactive (electronic) marketing for building one-to-one relationship with customers.

MKTG 5133* Marketing Management. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Consideration at an advanced level of the major elements of marketing from the point of view of the marketing executive. Emphasis on problem solving and decision making; using an interdisciplinary approach. Development of an integrated, comprehensive marketing strategy.

MKTG 5213* Services Marketing. Prerequisite(s): 5133. Services and services marketing with emphasis on services research and services management.

MKTG 5220* Seminar in Marketing. 3 credits, max 9. Prerequisite(s): 5133. Selected topics in marketing. Industrial marketing, product marketing, marketing strategy and decision-making. Consumer behavior, marketing institutions, marketing concepts, including the role of marketing in entrepreneurial ventures, and the role of entrepreneurship in a firm’s marketing efforts. Emphasis is placed on how to address the significant changes taking place in markets and the modern marketing function. (Same course as EEE 5223)

MKTG 5233* Global Competitive Environment. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Development of a global business strategy for the organization, issues of highly diversified markets and business environments, global competition, financial markets, and complex organizational relationships. (Same course as INTL 5233*)

MKTG 5243* Base SAS Programming for Database Marketing. Prerequisite(s): Admission in any graduate program. Learn basics of SAS programming, data manipulation in SAS environment and applications of SAS tools in the context of database marketing and business management. Class will help students prepare for Base SAS Programming and Advanced SAS Programming Certification Exam.

MKTG 5253 Advanced SAS Programming for Marketing Analytics. Prerequisite(s): MKTG 5243 or consent of instructor. Advanced SAS techniques to create more efficient and powerful SAS programs for analyzing marketing and business data. Extensive use of SQL, Macro along with Arrays, Hash objects and memory control within SAS environment. Helps students prepare for Advanced SAS Programming Certification Exam.

MKTG 5313* Marketing Research Methodology. Prerequisite(s): 5133. Research methodology applied to marketing problems. Measurement, survey research, experimentation, and statistical analysis of data.

MKTG 5333* Marketing for Nonprofit Organizations. Identify key challenges, and discuss how to apply fundamental marketing principles in order to solve these challenges within a wide range of nonprofit organizations.

MKTG 5443* Social Issues in Marketing Environment. Social and Legislative considerations as they relate to the Marketplace. Develop an understanding
of fundamental social marketing concepts and theories. Enhance your critical thinking and ethical analysis related to marketing practices. Obtain hands-on experience designing a social marketing plan. Strengthen problems solving, communications, and teamwork skills.

**MKTG 5500** Current Topics in Marketing Analytics. Prerequisite(s): Admission in any graduate program in business school or consent of instructor. Focuses on marketing analytics, marketing optimization analytics, high-performance analytics, visual analytics, marketing campaign analytics.

**MKTG 5553** International Marketing Strategy. Prerequisite(s): 5133. An analysis of marketing in the global environment, with environmental effects on international marketing management and corporate strategy decisions.

**MKTG 5613** Seminar in Consumer Behavior. Prerequisite(s): 5133 or consent of instructor. Psychological, sociological, and anthropological theories related to consumer decision processes. Special emphasis on current empirical research in consumer behavior.

**MKTG 5633** The External Environment of Business. Prerequisite(s): Admission in any graduate program or consent of MBA director. Social, ethical, regulatory, and political forces as they impact on the organization. Attention to organizational response to these forces through management policies and strategies.

**MKTG 5733** Introduction to Marketing Analytics. Prerequisite(s): Admission in MBA program or consent of instructor. Analytic tools including exploratory and graphical techniques, variable associations and correlations, regression, ANOVA and other related modeling techniques to improve managerial decision making. Same course as BAN 5733, MKTG 5983.

**MKTG 5743** Advanced Marketing Analytics. Prerequisite(s): MKTG 5733 or consent of instructor. Advanced analytics techniques such as neural networks, decision trees, classification and prediction models to generate deeper customer insights and to improve managerial decision making. Same course as BAN 5743, MKTG 5963.

**MKTG 5893** Advanced Data Mining Applications. Prerequisite(s): MKTG 5963 or permission from instructor. Advanced data mining tools such as clustering. Self-Organizing maps (SOM) and Kohonen Networks, two-stage models, customer attrition and churn models via survival analysis, credit scoring models, etc. In the context of common applications in business management. Same course as BAN 5763.

**MKTG 5963** Data Mining and Customer Relationship Management Applications. Lab 2. Prerequisite(s): MKTG 5963 or consent of MBA, MIS/MSIS, MSTM director or assistant director or instructor. Data mining and turning business data into actionable information. Use of various data mining tools such as neural networks, decision trees, classification and prediction models in the context of common applications in business management. Same course as BAN 5763.

**MKTG 5973** New Product Development. Prerequisite(s): Acceptance into the MBA program or consent of the MBA director. Elements involved in creating and selling a successful new product in a complex environment, including internal organizational and external environmental influences.

**MKTG 5983** Database Marketing. Prerequisite(s): Consent of MBA, MIS/MSIS, MSTM director or assistant director or instructor. Learn how to manage data, and analyze data using statistical tools such as multiple regression, ANOVA, Logistic regression, etc., and frameworks/models commonly used in database marketing such as RFM, LTV, etc. An overview of basic probability concepts and statistical sampling techniques including hypothesis testing (t-tests), contingency tables and Chi-square analysis will be provided. Same course as BAN 5733, MKTG 5733.

**MKTG 5993** Digital Business Strategy. Prerequisite(s): Consent of MBA, MIS/MSIS, or MSTM director or instructor. Businesses employment of digital technologies to craft a superior and unique value proposition for its customers and strategic partners.

**MKTG 6100** Advanced Seminar in Marketing. 1-3 credits, max 6. Prerequisite(s): Consent of instructor and doctoral student standing. Specialized topics in marketing for doctoral students.

**MKTG 6323** Seminar in Advanced Consumer Behavior. Prerequisite(s): MKTG 5133 or consent of the instructor. An interdisciplinary course examining empirical and theoretical studies of the factors that influence the acquisition, consumption, and disposition of goods, services, and ideas. Analysis of the psychological, sociological, anthropological, demographic, and regulatory forces that influence consumers. Examination of research methodologies employed to conduct empirical studies of consumer behavior.

**MKTG 6413** Advanced Marketing Research. Prerequisite(s): MKTG 5983 or MKTG 5963 or consent of MBA director or MIS director or instructor. Introduction to the latest empirical marketing research and advanced analytics techniques, including; Factor Analysis, Confirmatory Factor Analysis, Cluster Analysis, Scaling Techniques, Conjoint Analysis and Structural Equation Models. Same course as BAN 5763.

**MKTG 6513** Seminar in Marketing Theory. Prerequisite(s): 5133 or consent of instructor. Development of an evaluation of marketing theory.

**MKTG 6683** Seminar in Marketing Strategy. Prerequisite(s): 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.

**MKTG 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)

**MC 1143 (D,S)** Media in a Diverse Society. A study of the media and their effect on our culture, with an emphasis on the media’s role in racial, gender and sexual orientation issues in the United States. By analyzing the mass media, we learn to interpret the consequences of the stories they tell. An introductory course survey for majors and non-majors.

**MC 2003** Mass Media Style and Structure. Prerequisite(s): ENGL 1213 or ENGL 1223 or ENGL 1413 with grade of "C" or higher, and departmental majors only. Teaches basic writing skills vital to any career in mass communication. Emphasizes language skills with a focus on the rules of grammar and the meaning of words. Also teaches the basic strategies of information gathering, including how to glean accurate and useful background information from traditional and online sources. Introduces students to the fundamental writing styles and objectives required to convey information in different media.

**MC 2023** Electronic Communication. Prerequisite(s): ENGL 1213 or ENGL 1223 or ENGL 1413 with grade of "C" or higher, and departmental majors only. Introduces students to electronic communication with a series of hands-on projects to develop their skills with basic photography, videography, podcasting and web page development. Covers the various media platforms and teaches students visual grammar. Students create slide-shows and podcasts, learn to edit video, and develop Web pages using content created in class.

**MC 3113** Intro to Media Effects. Mass media's potential to influence audience behavior is a subject that has long fascinated scholars and the general public. Audience from working & sleeping, in details In the U.S. spend more time consuming media than any other activity. This course introduces media effects, and offers critical analysis methods to better understand the process and effects of the mediated message. A variety of media theories will be examined to understand how media can affect attitudes and behaviors on an individual and societal level. The theories will be used to examine a variety of different types of content, including media violence, portrayals of race and gender, entertainment, politics, strategic communication, and sport.

**MC 3173 (H)** History of Mass Communication. Growth and development of mass communication systems in America, with emphasis upon the economic, social, and political interaction of the media.

**MC 4143** Ethics and Issues in Mass Communications. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. Students examine classical theories of ethical behavior and their relevance to professional communicators. Students learn to analyze various moral viewpoints, so they can discern a justifiable system of ethical decision-making. Students apply ethical reasoning and professional codes of conduct to scenarios to determine the ethical action to take.

**MC 4153 (I)** International Mass Communication. Examination of the nature and flow of news and information within and among nations, states and societies from a theoretical vantage point grounded in region-specific realities. The political, economic, social, cultural and historical forces determining media practice in a global environment. No credit for students with credit in 5253.

**MC 4163** Mass Communication Law. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. Major principles of media law by examining the important court decisions, statutory and regulatory enactments in each area of communication law. Relevant constitutional freedoms and legal issues affecting professional communicators and their participants in a self-governing society. Practice applying the law and precedents to specific situations to determine if potential legal problems exist. No credit for students with credit in 5163.

**MC 4360** Special Problems in Mass Communication. 1-3 credits, max 6. Prerequisite(s): Junior standing, a minimum of 3.0 GPA, or consent of instructor. Independent student study and project development to fit the student's field of study.

**MC 4733** Responsibility in Mass Communication. Prerequisite(s): MC 2003 with a grade of “C” or better; and a pass proficiency. Interaction between mass media and society with emphasis upon the communicator’s ethical responsibilities. Meets with 5733. No credit for students with credit in 5733.

**MC 4993** Senior Honors Thesis. Prerequisite(s): Departmental invitation, senior standing, and permission of a supervising faculty member. With second faculty reader and oral examination. Required for graduation with departmental honors in the School of Media and Strategic Communications.

**MC 5000** Thesis. 1-6 credits, max 6. For mass communication graduate
students who are candidates for the master’s degree.

MC 5010* Capstone Project or Creative Component. 1-3 credits, max 4. Prerequisite(s): "B" or better in 5113, 5333, and 5651. Capstone research project or creative activity for a mass communication graduate student electing to not write a thesis to complete a master’s degree.

MC 5020* Advanced Practicum or Internship in Mass Communication. 1-3 credits, max 3. Prerequisite(s): One semester of graduate course work and consent of instructor. Independent training allowing students to relate theoretical principles to situations in professional settings. Required for students without mass media backgrounds.

MC 5030* Independent Study in Mass Communication. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Independent study, directed readings or project development in mass communications to fit the student’s academic and professional interests.

MC 5113* Methods of Research in Mass Communication. Principles and techniques of research; research planning, design and measurement in mass communication.

MC 5143* Diversity of Sports Media. This course examines sports media content, interaction of the medium, and audiences in relation to diversity. Primary emphases are placed on race and ethnicity, gender, sex, LGBT, national identity, and disability. Sports media coverage of each group is examined from a historical perspective up through the 21st Century convergence of broadcast, online, and print journalism. Particular focus is placed on diversity of sport media gatekeepers. This course is taught fully online, with all lectures, assignments, exams, and activities completed online through D2L.

MC 5163* Mass Communication Law. Prerequisite(s): 2003 and graduate standing. Major principles of media law by examining the important court decisions, statutory enactments in each area of communication law. Relevant constitutional freedoms and legal issues affecting professional communicators and all participants in a self-governing society. Practice applying the law to determine if potential legal problems exist. Meets with 4163. No credit for students with credit in 4163.

MC 5223* Mass Communication Research Analysis and Interpretation. Prerequisite(s): 5113. Single- and multi-variates analysis, interpretation and reporting of mass communication research data. Use of computers in research analysis.

MC 5253* International Mass Communication. Examination of the nature and flow of news and information within and among nations, states, and society from a theoretical vantage point grounded in region-specific realities. The political, economic, social, cultural and historical forces determining media practice in a global environment. No credit for students with credit in 4153.

MC 5333* Media Theory. Prerequisite(s): Graduate standing. Mediating factors that affect the interaction of ingredients in the communications process, and how these factors can affect the fidelity of information conveyed.

MC 5383* Media Relations. Prerequisite(s): Graduate standing. Strategies for dealing with the news media. Students will gain hands-on experience in conducting media news conferences, pitching story ideas and preparing themselves and others for dealing with news media personnel. Meets with SC 4383. No credit for students with credit in SC 4520 during the same semester or with the same subtitle.

MC 5540* Specialized Multimedia Journalism Applications. 3 credits, max 6. Prerequisite(s): Graduate standing. Professional multimedia communications at an advanced level. Professional emphases are placed on non-profit, corporate, agency, international and other specialized applications. Course content varies by semester. No credit for students with credit in SC 4520 during the same semester or with the same subtitle.

MC 5550* Specialized Sports Media Applications. 3 credits, max 6. Prerequisite(s): Graduate standing. Professional sports media at an advanced level. Special topics in areas such as sports media production, announcing, performance, sports feature, column and editorial writing. Course content varies by semester. Meets with MMJ 4540. No credit for students in MMJ 4540 during the same semester or with the same subtitle.

MC 5560* Specialized Sports Media Applications. 3 credits, max 6. Prerequisite(s): Graduate standing. Professional sports media at an advanced level. Special topics in areas such as sports media production, announcing, performance, sports feature, column and editorial writing. Course content varies by semester. Meets with MMJ 4540. No credit for students in MMJ 4540 during the same semester or with the same subtitle.

MC 5603* Integrated Marketing Communication. Prerequisite(s): MC 2003; SC 2183; or MKTG 3213 and graduate standing. Planning and the value of coordinating the various promotional mix elements within a communication campaign to create maximum clarity and impact. Communication elements including advertising, public relations, direct marketing and sales promotion and examine strategies for combining and integrating them into an effective campaign. Theories, models and tools to make better promotional communication decisions. No credit for students with credit in SC 4503.

MC 5613* Readings in Mass Communication. Prerequisite(s): Graduate standing. Readings in Mass Communications is a graduate seminar course designed to expose students to significant books in the field of journalism and mass communication. Students will read from an assigned list of important books and present written and oral reports on a weekly basis. Documentary films on contemporary issues in journalism and mass communication will also be viewed by the class, discussed and critiqued.

MC 5651* Introduction to Graduate Study in Mass Communications. Prerequisite(s): Graduate standing. Orientation to skills necessary for successful completion of graduate work. Training in library and archival research, academic writing, and preparation of research reports, familiarization with theoretical concepts and issues associated with mass communication. Required of all mass communication MS candidates, and prerequisite to MS candidates enrolling in mass communication seminars.

MC 5733* Responsibility in Mass Communication. Prerequisite(s): Graduate standing. Interaction between mass media and society with emphasis upon the communicator’s ethics and responsibilities. Meets with 4733. No credit for students with credit in 4733.

MC 5753* Media and Elections. Prerequisite(s): Graduate standing. Examination of media’s role in the political process with primary emphasis on print and broadcast journalism practices. Meets with MMJ 4753. No credit for students with credit in MMJ 4753.

MC 5770* Seminar in Communication Media. 1-3 credits, max 9. Prerequisite(s): Graduate standing. International communication, media history, legal research, new technology, women and the media, television and children, industry, television, and communication research.

MC 5773* Censorship. Prerequisite(s): Graduate standing. A critical examination of historical and contemporary occurrences of censorship from legal, philosophical, political, religious and sociological perspectives. The course will explore the definition of censorship, the common elements found in all forms of censorship, the rationalizations and justifications for censoring, and the consequences and unintended results of censorship. No credit for students with credit in MMJ 4773.

MC 5783* Strategic Communication Management. The focus of this course is on an integrated approach to the management of communication in an organization, using theoretical concepts from both public relations and advertising, but particularly grounded in organizational theory. It highlights 13 themes/issues relevant to strategic communication managers and reviews communication, management, organizational, cultural, philosophical, and persuasion theories.

MC 5863* Managing Multimedia News Outlets. Prerequisite(s): 2003 and graduate standing. Basic issues, concepts, operational procedures and strategies associated with effectively managing media corporations. Examines management operations related to media convergence. Emphasis is placed on management decisions and administrative choices in staffing and content that reflect a community’s diversity. Meets with MMJ 4863. No credit for students with credit in MMJ 4863.

MC 5873* Sport Media Management. This course examines the symbiotic relationship between sport and mass media from a managerial perspective. Primary emphases are placed on decision-making, leadership styles, best managerial practices, current trends, and resource allocation for sport media management in relation to the 21st Century convergence of broadcast, online, and print journalism. Key issues confronted by sport media are discussed. This course is taught fully online, with all lectures, assignments, exams, and activities completed online through D2L.

MC 5883* Advanced Media Management. Prerequisite(s): Graduate standing. Management concerns in four areas of mass communication practice: public relations, advertising, broadcasting and print journalism. Different emphases offered according to student demand or need.

MC 5933* Theories of Persuasion. Prerequisite(s): Graduate standing. In order to extend our understanding of Strategic Communication, it is important to study the large body of scientific research dealing with persuasion and persuasive communication. This is not a course on how to be a better persuader, but instead a study of the theories of persuasion. However by exploring the academic literature on persuasion, many strategies can be learned and used to not only make us better communicators, but also to help us resist persuasive attempts that we may encounter as citizens and consumers.

MC 5953* Strategic Health Communications Campaigns. Prerequisite(s): Graduate standing. The course will focus on the theoretical approaches to health message design and the most effective and strategic use of traditional and new media outlets. Students also will review and discuss examples of past and current health communication campaigns in the United States and around the world. Integrating theory and practice, students will apply these concepts to design strategic communication campaigns for area health agencies and organizations.

Master of Athletic Training (MAT)

MAT 5103* Emergency Management in Athletic Healthcare. Prerequisite(s): Admission to the Entry Level Masters degree Athletic Training Education Program. Development of essential skills and competencies necessary to manage emergency situations. Previously offered as HHP 5103.

MAT 5183 Injury Prevention. Prerequisite(s): Admission to the Early Level Masters degree Athletic Training Education Program. Introduction to injury etiology, appropriate injury prevention and the administration of subsequent medical care. Based in didactic theory and practical experience regarding many
aspects of Athletic Healthcare. Previously offered as HHP 5184.

MAT 5202* Athletic Training Practicum I. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. Supervised clinical experiences in athletic training emphasizing concepts in injury prevention, acute care and injury management. Previously offered as HHP 5201 and MAT 5182.

MAT 5233* Clinical Evaluation and Diagnosis of the Lower Extremity. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program and HHP 5122. Discussion and application of common electronic and physiologic devices used in the treatment of acute and chronic injuries to the musculoskeletal systems. This course is designed to introduce the student to various therapeutic agents used in the treatment of injury through problem based learning. Previously offered as HHP 5222.

MAT 5243* Therapeutic Exercise of the Lower Extremity. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. Scientific methods used in therapeutic exercise and rehabilitation of lower extremity injuries. Investigation of mechanisms of injury, anatomical structures involved and methodological approach in designing rehabilitative programs. Previously offered as HHP 5244.

MAT 5302* Athletic Training Practicum II. Prerequisite(s): HHP 5201 Athletic Training Practicum I. Interactive and supervised clinical experiences in athletic training emphasizing diagnosis, treatment and rehabilitation of injuries to the lower extremity. Previously offered as HHP 5301.

MAT 5313* Clinical Evaluation and Diagnosis of General Medical Conditions. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. To present the student with specific pathological, medioclinical presentations and possible treatments, and nonorthopedic conditions. Based in medical theory and practical outcomes, this course will prepare students to evaluate, treat and refer to proper medical professionals. Previously offered as HHP 5314.

MAT 5333* Clinical Evaluation and Diagnosis of the Upper Extremity. Prerequisite(s): HHP 5324. Advanced knowledge and skills related to evidence based practice in the recognition, diagnosis and appropriate medical referral of injuries to the upper extremities. Previously offered as HHP 5334.

MAT 5343* Therapeutic Exercise of the Upper Extremity. Prerequisite(s): HHP 5244. Evidence based practices used in therapeutic exercise and rehabilitation of upper extremity injuries. Investigation of mechanisms of injury, anatomical structures involved and methodological approach in designing rehabilitative programs. Previously offered as HHP 5344.

MAT 5402* Athletic Training Practicum III. Prerequisite(s): HHP 5301 Athletic Training Practicum II. Interactive and supervised clinical experiences in athletic training emphasizing diagnosis, treatment and rehabilitation of injuries to the upper extremity. Previously offered as HHP 5401.

MAT 5412* Radiography Evaluation and Assessment. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. To introduce the student to the fundamental principles, equipment and common methods and procedures of radiography. Previously offered at HHP 5412.

MAT 5443* Clinical Diagnosis, Evaluation, and Therapeutic Exercise of the Head and Spine. Prerequisite(s): HHP 5344. Advanced knowledge and skills related to the recognition, diagnosis and appropriate medical referral of injuries to the lumbar, thoracic and cervical spine and head. Scientific methods used in therapeutic exercise and rehabilitation of head and spine injuries. Previously offered as HHP 5444.*

MAT 5483* Pathology and Pharmacology in Sports Medicine. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. Various pathological conditions and common pharmaceutical interventions as they relate to pharmacokinetics and pharmacodynamics. Previously offered as HHP 5483.

MAT 5502* Athletic Training Practicum IV. Prerequisite(s): HHP 5401 Athletic Training Practicum III. Interactive and supervised clinical experiences in athletic training emphasizing diagnosis, treatment and rehabilitation of injuries to the head and spine and general medical conditions. Previously offered as HHP 5501.

MAT 5553* Research Methods in Athletic Healthcare. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. This course discusses the importance of conducting research in athletic training and the healthcare professions. Emphasis is placed on research design, ethics, collection of data, and the dissemination of results. Previously offered as HHP 5533.

MAT 5573* Athletic Healthcare Administration. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. The administration and organization of athletic healthcare programs including planning and implementation, certification procedures, code of professional practice, safety standards and resource management. Previously offered as HHP 5573.

MAT 5583* Psychosocial Strategies in Athletic Healthcare. Prerequisite(s): Admission into the Entry Level Masters degree Athletic Training Education Program. Development of psychosocial strategies and referral competencies set by the National Athletic Trainers Association Board of Certification. Previously offered as HHP 5583.

MAT 5602* Athletic Training Practicum V. Prerequisite(s): HHP 5501 Athletic Training Practicum IV. Interactive and supervised clinical experiences in athletic training emphasizing evidence based practices and administrative responsibilities. Previously offered as HHP 5601.

Master of Business Administration (MBA)

MBA 5010* Independent Study. 3-6 credits, max. 6. Prerequisite(s): 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.

MBA 5100* Professional Development. 1 credit, max. 6. Prerequisite(s): Admission to MBA program or consent of MBA director. Career and professional development of MBA students. A blend of guest speakers, projects, and exercises used to better prepare students for advanced business careers.

MBA 5192* Managing Operations and Decision Processes. Prerequisite(s): MAT 5722. 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.

MBA 5261* Legal Issues in Business. Prerequisite(s): 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.

MBA 5300* Current Business Topics. 1-6 credits, max. 9. Prerequisite(s): Admission to the MBA program or consent of the director. Examination of selected topics representing the most current academic and business concepts.

MBA 5310* Integrative Decision-Making II: Crossing Organizational Boundaries. 2-6 credits, max. 6. Prerequisite(s): 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.

MBA 5400* Business Practicum. 1-3 credits, max. 3. Prerequisite(s): 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.

MBA 5500* Interdisciplinary Inquiry in Business Administration. 1-3 credits, max. 9. Prerequisite(s): Admission to a SSB graduate program or consent of MBA director. Independent investigation of a business problem under the direction of a supervising professor.

Master of Public Health (MPH)

MPH 5000* Master’s Thesis. Independent research in public health for MPH degree.

MPH 5030* MPH Practicum. Supervised practicum experience in public health for MPH degree.

MPH 5221* Epidemiology and Evidence-Based Medicine. Prerequisite(s): Graduate standing and consent of instructor. Principles and uses of evidence-based practice of veterinary medicine; comprehension and utilization of scientific research; interpretation of basic concepts of observational study of disease. Previously offered as VMED 5221 and VMED 7221.*

MPH 5413* Food Safety and Public Health. Prerequisite(s): Graduate standing and consent of instructor. Introduction to public health and diseases transmissible to humans. Potential human health hazards in foods of animal origin and principles of safe food production, processing, handling and inspection, including pathogen reduction and HACCP regulations. Same course as VBSC 5413.*

Materials Science and Engineering (MSE)

MSE 5000* MS Thesis. Lab 1-6. Prerequisite(s): Graduate standing and permission of instructor. Students will be performing thesis research under the guidance of a thesis advisor. This will involve performing literature search, writing proposal for the research and conducting research in the laboratories. At the end of the course students will present the findings of research to the
MSE 5010* Materials Science and Engineering Seminar for Masters Students. Prerequisite(s): Graduate standing or consent of instructor. Advanced Research and Development Topics. Maximum 3 credit hours. Graded on a pass/fail basis.

MSE 5012* Advanced Thermodynamics of Materials. Prerequisite(s): Graduate standing and permission of instructor. Thermodynamics of materials is important for materials synthesis, stability and performance. The course will cover basic laws of thermodynamics, solution theory, phase equilibrium diagrams and thermodynamics of electrochemical systems.

MSE 5023* Diffusion and Kinetics. Prerequisite(s): Graduate standing and permission of instructor. Diffusion and kinetics are important for materials processes, stability, microstructure evolution and performance. The course will cover basic concepts underlying diffusion and kinetics as they relate to materials behavior. Topics on diffusion, nucleation and growth, spinodal decomposition, reactions involving solid with solids, gases and liquids, and phase transformation will be covered.

MSE 5030* Independent study in Materials Science and Engineering. Prerequisite(s): Graduate standing and permission of instructor. Currently, there is no course number specifically related to the creative component (2 hour credit) that needs to be registered for by an M.S. creative component. Further, independent study courses could be offered by individual faculty in specific areas related to a student’s graduate study.

MSE 5033* Composite Materials. Prerequisite(s): Graduate standing and permission of instructor. Composites are important for advancing performance and reliability of existing and new products for aerospace, electronics, and medical systems. The course is to introduce fundamental concepts for design, fabrication and mechanical property evaluation of composites. This includes methods of fabricating fibers, matrices and composites, toughening mechanisms in composites, mechanical properties, and role of interfaces. The focus will be on composites useful at high temperatures.

MSE 5043* Advanced Materials Characterization. Lab 1. Prerequisite(s): Graduate standing and permission of instructor. Advances in materials require availability, training, and proficiency in advanced instrumentation to characterize materials at length scales from macro- to nanometer-scale. This course is to introduce fundamental concepts forming the basis of different equipments, their operation and capability for developing advanced materials. This includes instruments such as SES, TEM, x-ray diffraction, FTIR, AFM, and Nanodentation. The lectures will be complemented with hands-on experience to students in labs housing these equipments.

MSE 5053* Smart Materials. Prerequisite(s): Graduate standing and permission of instructor. Advances in new technologies rely on the availability of “smart” materials that adapt to environment. Examples include sun-sensor glasses that become dark in sunlight and clear-out when indoors, and shape-memory materials used as stents in human body. In this course, the definition of a smart material and to understand principles of using electrical and other functional properties of materials to create smart systems is covered. Students are also taught to search literature on a suitable topic and work as a group to write a term paper. In addition, a presentation to the class will be required. The focus will be on smart materials useful at high temperatures.

MSE 5063* Biomedical Materials. Prerequisite(s): Graduate standing and permission of instructor. The course will discuss about structure, composition, properties, and performance of materials with applications in medical and health science.

MSE 5073* Tissue Engineering. Prerequisite(s): Graduate standing or consent of instructor. Tissue engineering (TE) and the material strategy for different tissue constructs in bone TE, liver TE, neural TE, intestine TE, etc. will be introduced. At the end of the course, students will present the findings of the research to the guidance of a thesis advisor. This will involve performing literature search, writing proposal for the research and conducting research in the laboratories. At the end of the course, students will present the findings of the research to the guidance of a thesis advisor.

MSE 5083* Advanced Ceramics Processing. Prerequisite(s): ENSC 2213 and ENSC 3233 and MATH 2153 or permission of instructor. An introduction to organic materials with applications to active electronic and optoelectronic devices.

MSE 5093* Materials Science and Engineering Seminar for PhD Students. Prerequisite(s): Graduate standing or consent of instructor. Graduate students need to learn about the advances in materials and their processing, training and proficiency at length scales from macro to nanometer. This seminar course will allow students to interact with the experts and other students in the field and introduce descriptions of projects, as well as the concepts of structure-property co-relationships of advanced materials. This will allow the students to become better researchers and form the basis of future ideas and concepts. Guest speakers from different areas, industry and other universities will be invited.
Mathematics (MATH)

MATH 1483 (A) Mathematical Functions and Their Uses. Prerequisite(s): An acceptable placement score (see http://placement.okstate.edu). Analysis of functions and their graphs from the viewpoint of rates of change. Linear, exponential, logarithmic and other functions. Applications with the natural sciences, agriculture, business and the social sciences.

MATH 1493 (A) Applications of Modern Mathematics. Prerequisite(s): An acceptable placement score (see http://placement.okstate.edu). Introduction to contemporary applications of discrete mathematics. Topics from management science, statistics, coding and information theory, social choice and decision making, geometry and growth.

MATH 1513 (A) College Algebra. Prerequisite(s): An acceptable placement score (see http://placement.okstate.edu). Two years of high school algebra recommended. Quadratic equations, functions and graphs, inequalities, systems of equations, exponential and logarithmic functions, theory of equations, sequences, permutations and combinations. Combined credit toward a degree for 1513, 1613 and 1715 limited to six hours.

MATH 1583 (A) Applied Geometry and Trigonometry. Prerequisite(s): A grade of "C" or better in one of 1483 or 1513, or an acceptable placement score (see placement.okstate.edu). Geometry, trigonometry, and their applications to technology and design. Not intended for calculus-bound students. Combined credit toward a degree for 1513, 1613 and 1715 limited to six hours. Satisfies the six hour general education Analytical and Quantitative Thought requirement.

MATH 1910 Special Studies. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Special subjects in mathematics.

MATH 2103 (A) Business Calculus. Prerequisite(s): A grade of "C" or better in one of 1483 or 1513, or an acceptable placement score (see http://placement.okstate.edu). An introduction to calculus in the context of applications to business.

MATH 2123 (A) Calculus for Technology Programs I. Prerequisite(s): 1613 with grade of "C" or better, or 1715 with a grade of "C" or better, or an acceptable placement score (see http://placement.okstate.edu). First semester of a terminal course in calculus for students in the School of Technology. Functions and graphs, differentiation and integration with applications.

MATH 2133 (A) Calculus for Technology Programs II. Prerequisite(s): MATH 2123 with a grade of "C" or better. 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.

MATH 2144 (A) Calculus I. Prerequisite(s): MATH 1613 with grade of "C" or better, or MATH 1715 with a grade of "C" or better, or an acceptable placement score (see http://placement.okstate.edu). An introduction to derivatives, integrals and their applications.

MATH 2153 (A) Calculus II. Prerequisite(s): MATH 2144 with grade of "C" or better. A continuation of MATH 2144, including techniques of integration, series and their applications, parametric equations, and polar coordinates.

MATH 2163 Calculus III. Prerequisite(s): 2153 with grade of "C" or better. A continuation of 2153, including differential and integral calculus of functions of several variables and an introduction to vector analysis.

MATH 2233 Differential Equations. Prerequisite(s): 2153 with grade of "C" or better. Methods of solving ordinary differential equations with applications. First order equations, linear equations of higher order, series solutions and Laplace transforms. Combined credit toward a degree for MATH 2233, MATH 3013, and MATH 3263 limited to six hours.

MATH 2910 Special Studies. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Special subjects in mathematics.

MATH 3013* Linear Algebra. Prerequisite(s): MATH 2153. Algebra and geometry of finite-dimensional linear spaces, linear transformations, algebra of matrices, eigenvalues and eigenvectors. Combined credit toward a degree for MATH 2233, MATH 3013 and MATH 3263 limited to six hours.

MATH 3263* Linear Algebra and Differential Equations. Prerequisite(s): MATH 2153 with a grade of "C" or better. An integrated treatment of linear algebra and differential equations. Combined credit toward a degree for MATH 2233, MATH 3013, and MATH 3263 limited to six hours.

MATH 3303 Functions and Modeling. Prerequisite(s): 2153. Models of real-world phenomena using functions, rates of change, basic differential equations, and other concepts from algebra and calculus. Connections between college mathematics, secondary school mathematics, and applications. Includes laboratory assignments.

MATH 3403 Geometric Structures for Early Childhood and Elementary Teachers. Prerequisite(s): 1483, 1493 or 1513. Foundations of geometry for prospective early childhood and elementary educators. Points to the natural numbers, whole numbers, integers, rational numbers, real numbers, polygons and polyhedra, similarity and congruence, geometric constructions, motion and transformations. Class format may emphasize student investigation and discovery, discussion and presentation, and working with manipulative tools. This course, together with MATH 3603, prepares students for CIED 3153 and 4153 and/or HDF 3223.

MATH 3603 Mathematical Structures for Early Childhood and Elementary Teachers. Prerequisite(s): 1483, 1493 or 1513. Foundations of mathematics and number concepts for prospective early childhood and elementary educators. Problem solving, logic, set theory, functions and relations, number systems, number theory, rational numbers, decimals, fractions, probability, and applications. Class format may emphasize student investigation and discovery, discussion and presentation, and working with mathematical tools. Together with MATH 3403, it prepares students for CIED 3153 and 4153 and/or HDF 3223.

MATH 3613* Introduction to Modern Algebra. Prerequisite(s): 3013. An introduction to mathematical reasoning including logical structure of statements, quantifiers, basic set theory and techniques of proof. Modular arithmetic, the Euclidean algorithm, rings and integral domains, polynomial rings.

MATH 3910 Special Studies. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Special subjects in mathematics.

MATH 3933 Research Methods. Prerequisite(s): 2144: PHYS 1114 or 2014, or STAT 2013 or 4013. Students perform independent inquiries and learn to combine skills from mathematics and science to solve research problems. Students will design experiments, collect and analyze data, formulate hypotheses, justify conclusions, create mathematical models, read and evaluate the research literature, and write and present research papers. No credit for students with degree credit in BIOL 3933.

MATH 4003* Mathematical Logic and Computability. Prerequisite(s): MATH 3613 or PHIL 3003 or consent of instructor. The basic metatheorems of first order logic: soundness, completeness, Lowenheim-Skolem theorem, undecidability of first order logic, Godel's incompleteness theorem. Enumerability, diagonalization, formal systems, standard and nonstandard models, Godel numberings, Turing machines, recursive functions, and evidence for math's thesis. (Same course as PHIL 4003).

MATH 4013* Calculus of Several Variables. Prerequisite(s): 2163 and 3013. Differential and integral calculus of functions of several variables, vector analysis, Stokes' Theorem, Green's Theorem and applications.

MATH 4023* Introduction to Analysis. Prerequisite(s): MATH 2163 and MATH 3613 or consent of instructor. An introduction to analysis of functions of one real variable emphasizing the reading and writing of mathematical proof. Basic logic, set theory, functions and relations, cardinality of sets. Structure of the real numbers, completeness, open and closed sets, compact sets. Convergence of sequences bounded and monotone sequences, subsequences. Limits of functions, continuity.

MATH 4033* History of Mathematics. Prerequisite(s): 2153. Early development of mathematics as a science, contributions of Greek mathematics, mathematical advancements of the 17th and 18th centuries, and the mathematics of the 19th and 20th centuries. The emphasis in the course will be on replicating the setting and techniques of the times to understand the nature of a discovery and its relationship to contemporary thought.

MATH 4063 Advanced Linear Algebra. Prerequisite(s): 3013. A rigorous treatment of vector spaces, linear transformations, determinants, orthogonal and unitary transformations, canonical forms, bilinear and hermitian forms, and dual spaces. Meets with 5023. No degree credit for students with credit in 5023.

MATH 4143 Advanced Calculus I. Prerequisite(s): 3013 and 4023. A rigorous treatment of calculus of one and several variables. Elementary topology of Euclidean spaces, continuity and uniform continuity, differentiation and integration. Meets with 5043. No credit for students with credit in 5043.

MATH 4153* Advanced Calculus II. Prerequisite(s): 4143. Continuation of 4143. A rigorous treatment of sequences and series of functions, uniform convergence, differentiation and integration of vector-valued functions, and differential forms. Meets with 5053. No credit for students with credit in 5053.


MATH 4263* Introduction to Partial Differential Equations. Prerequisite(s): 2163, 2233, 3013. Solution of the standard partial differential equations (Laplace's equation, transport equation, heat equation, wave equation) by separation of variables and transform methods, including spherical harmonics, Fourier and Laplace transform. Boundary value problems, Sturm-Liouville theory, orthogonal, Fourier, Bessel, and Legendre series, spherical harmonics.

MATH 4823* Complex Variables. Prerequisite(s): 2163. Properties of complex functions of a complex variable, analytic functions, Cauchy equations, residues and their applications, Laurent series, and the calculus of residues.
numbers, analytic functions of a complex variable, contour integrals, Cauchy's integral Theorem, power series and Laurent series, residues and poles, conformal mapping, and applications.

MATH 4343* Introduction to Topology. Prerequisite(s): MATH 4023. Topological spaces, basic point-set topology, introduction to surfaces and three-manifolds, introductory knot theory, applications.

MATH 4403* Geometry. Prerequisite(s): 3013, recommended 3613. An axiomatic development of Euclidean and non-Euclidean geometries.

MATH 4423* Geometry and Algorithms in Three-Dimensional Modeling. Prerequisite(s): A grade of “C” or better in MATH 2163 and MATH 3013 and (CS 1113 or ENGR 1412) or consent of instructor. Mathematical background required for the representation and manipulation of curves and surfaces in computer-aided design. Application of these topics to practical 3D modeling, via both graphical user and scripting interfaces, and 3D printing. Project topics center on three-dimensional visualization of mathematical concepts.

MATH 4453* Mathematical Interest Theory. Prerequisite(s): 2153. Fundamental concepts of financial mathematics including simple and compound interest, inflation, yield rates, and equations of value for annuities, stocks, bonds, and other financial instruments. Determining equivalent measures of interest, determining yield rates, estimating rates of return, amortization.

MATH 4513* Numerical Mathematics: Analysis. Prerequisite(s): 2233, 3013, knowledge of programming or consent of instructor. Machine computing, algorithms, and applications of numerical methods to problems arising in the solution of differential equations. No credit for students with credit in CS 4513.

MATH 4553* Linear and Nonlinear Programming. Prerequisite(s): 2163, 3013. Linear programming, simplex methods, duality, sensitivity analysis, integer programming, nonlinear programming.


MATH 4590 Professional Practice in Mathematics. 1-3 credits, max 3. Prerequisite(s): 2163, 2233, 3013 and consent of instructor. Experience in applying mathematical principles to solve problems encountered during employment or an internship in business, industry or government. Documentation of solutions through written and oral reports.

MATH 4613 Modern Algebra I. Prerequisite(s): 3613. An introduction to the theory of groups and vector spaces. Meets with 5003. No credit for students with credit in 5003.

MATH 4623 Modern Algebra II. Prerequisite(s): 4613. Continuation of 4613. An introduction to the theory of rings, linear transformation and fields. Meets with 5013. No credit for students with credit in 5013.

MATH 4663* Combinatorial Mathematics. Prerequisite(s): 3013. Counting techniques, combinatorial functions, difference equations and recurrence relations, introduction to graph and network theory.

MATH 4713* Number Theory. Prerequisite(s): 3613. Divisibility of integers, congruencies, quadratic residues, distribution of primes, continued fractions and the theory of ideals.

MATH 4753* Introduction to Cryptography. Prerequisite(s): MATH 3013, MATH 1053 or CSCI 2033. Classical and modern techniques for transcoding and managing information in the presence of eavesdroppers or adversaries and the mathematical principles on which they are based. Symmetric and asymmetric ciphers such as RSA and public key cryptography. Modular arithmetic, the factoring problem, and the discrete logarithm problem.

MATH 4813* Groups and Representations. Prerequisite(s): 3013 and either 3613 or consent of instructor. An introduction to groups, group actions, symmetry groups, representations and characters. Further topics may include infinite symmetry groups, applications to chemistry and physics, and finite isometry groups and geometry.

MATH 4900 Undergraduate Research. 1-4 credits, max 4. Prerequisite(s): Consent of instructor. Directed readings and research in mathematics.

MATH 4910* Special Studies. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Special subjects in mathematics.

MATH 4950 Problem Solving Seminar. 1-3 credits, max 3. Prerequisite(s): 2233, 3013. The general process of problem solving. Selected problem-solving techniques. Applications to challenging problems from all areas of mathematics.

MATH 4993 Senior Honors Thesis. Prerequisite(s): Consent of instructor, senior standing, Honors Program participation, and one credit hour of HONR 3000 or MATH 4900. A guided reading and research program ending with an honors thesis under the direction of a faculty member, including a public presentation. Required for graduation with departmental honors in mathematics.

MATH 5000* Master's Research and Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of advisory committee. Directed reading and research culminating in the master's report or master's thesis.

MATH 5003* Modern Algebra I. Prerequisite(s): 3613. An introduction to the theory of groups and vector spaces. Meets with 4613. No credit for students with credit in 4613.

MATH 5010* Seminar in Mathematics. 1-3 credits, max 12. Prerequisite(s): Consent of instructor. Topics in mathematics.

MATH 5013* Modern Algebra II. Prerequisite(s): 4613 or 5003. Continuation of 5003. An introduction to the theory of rings, linear transformations and fields. Meets with 4623. No credit for students with credit in 4623.

MATH 5023* Advanced Linear Algebra. Prerequisite(s): 3013. A rigorous treatment of vector spaces, linear transformations, determinants, orthogonal and unitary transformations, canonical forms, bilinear and hermitian forms, and dual spaces. Meets with 4063. No credit for students with credit in 4063.

MATH 5043* Advanced Calculus I. Prerequisite(s): 3013 and 4023. A rigorous treatment of calculus of one and several variables. Elementary topology of Euclidean spaces, continuity and uniform continuity, differentiation and integration. Meets with 4143. No credit for students with credit in 4143.

MATH 5053* Advanced Calculus II. Prerequisite(s): 4143 or 5043. Continuation of 5043. A rigorous treatment of sequences and series of functions, uniform convergence, differentiation and integration of vector-valued functions and differential forms. Meets with 4153. No credit for students with credit in 4153.

MATH 5133* Stochastic Processes. Prerequisite(s): 2233, 3013 and STAT 5123. Definition of stochastic processes, probability structure, mean and covariance function, the set of sample functions, stationary processes and their spectral analysis, renewal processes, counting processes, counting analysis, discrete and continuous Markov chains, birth and death processes, exponential model, queuing theory. (Same course as IEM 5133 & STAT 5133).

MATH 5143* Real Analysis I. Prerequisite(s): 4153 or 5053. Measure theory, measurable functions, integration and differentiation with respect to measures.


MATH 5193* Differentiable Manifolds. Prerequisite(s): MATH 4153 or MATH 5053; recommended MATH 4343 or MATH 5303. Differentiable manifolds and maps, tangent vectors, vector fields, integral curves, submanifolds, differential forms, and integration. Additional topics may be selected from: flows, Lie derivatives, the Frobenius theorem, structures defined by differential forms, vector bundles and de Rham theory.

MATH 5213* Fourier Analysis and Wavelets. Prerequisite(s): 4013 or 4023. Orthogonal series expansions, Fourier series and integrals and boundary value problems. Haar wavelets and multiresolution analysis. Applications.

MATH 5233* Partial Differential Equations. Prerequisite(s): 4013, 4143 and 4233 or consent of instructor. Representation formulas for solutions of transport equation, Laplace’s equation, heat equation and wave equation, mean value theorems, maximum principle, Green’s functions, characteristics, eigenvalue problems, separation of variables, transform methods, variational methods, general theory of first order equations.

MATH 5243* Ordinary Differential Equations. Prerequisite(s): 4143 or 5043; consent of instructor. Banach space, Banach space mapping principle, existence and uniqueness theorems, linear systems, higher-order linear equations, boundary value and eigenvalue problems, stability and asymptotic behavior, attractors, Gronwall’s inequality, Liapunov method.

MATH 5253* Advanced Ordinary Differential Equations. Prerequisite(s): 5243. Selected topics in ordinary differential equations.

MATH 5283* Complex Analysis I. Prerequisite(s): MATH 4143 or MATH 5043. Basic topology of the plane, functions of a complex variable, analytic functions, transformations, infinite series, integration and conformal mapping.

MATH 5293* Complex Analysis II. Prerequisite(s): 5283. Riemann Mapping Theorem, meromorphic functions, analytic continuation, Dirichlet problem, and entire functions.

MATH 5303* General Topology. Prerequisite(s): 4143 or 5043 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.

MATH 5313* Geometric Topology. Prerequisite(s): 4613 or 5003, 5303. Manifolds, complexes, the fundamental group, covering spaces, combinatorial group theory, the Seifert-Van Kampen theorem, and related topics.

MATH 5413* Differential Geometry. Prerequisite(s): 4013 or 4543 or 5043. Differential manifolds, vector fields, differential forms, connections, Riemannian metrics, geodesics, completeness, curvature, and related topics.

MATH 5473* Financial Calculus. Prerequisite(s): 4143 or 5043, STAT 4203 or consent of instructor. Introduction to derivative prices and contingent claims. Introduction to the Itô-Doobin calculus and martingales; the martingale properties of Brownian motion, the Black-Scholes-Merton theory as a simple, special case of martingale pricing, market models of modern fixed income pricing, interest rates, insurance, hedging, and options.

MATH 5543* Numerical Analysis for Differential Equations. Prerequisite(s): 4233, 4513 or CS 4513. 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.

MATH 5553* Numerical Analysis for Linear Algebra. Prerequisite(s): 3013, and 4513 or CS 4513. Advanced machine computing, algorithms, analysis of rounding errors, condition, convergence, and stability applied to direct and iterative solution 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.

MATH 5563* Finite Element Methods for Partial Differential Equations. Prerequisite(s): 4023, 4263, and 4513 or CS 4513 or equivalent. 4143 or 5043 preferred. Theory and practice of finite element methods, including elliptic boundary value problems, weak formulations, the Ritz-Galerkin method, conforming and non-conforming finite elements, error estimates, and numerical experiments.

MATH 5583* Case Studies in Applied Mathematics. 1-3 credits, max 6. Prerequisite(s): 2233, 4013, and knowledge of computer programming. Selected mathematical problems from industry. Independent problem-solving, oral presentation of solutions, and technical report writing. Seminar-style format.

MATH 5593* Methods of Applied Mathematics. Prerequisite(s): 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.

MATH 5613* Algebra I. Prerequisite(s): 4613 or 5003. A rigorous treatment of classical results in group theory and ring theory.

MATH 5623* Algebra II. Prerequisite(s): 5613. A rigorous treatment of classical results in module theory and field theory.

MATH 5902* Seminar and Practicum in the Teaching of College Mathematics. Prerequisite(s): Graduate standing in mathematics or consent of instructor. Foundations of college mathematics teaching, including lecturing, grading and exam preparation. Adapting classroom activities to better serve different types of learners. Current trends in mathematics education such as calculus reform, cooperative learning, and technology in the classroom.

MATH 5913* Introduction to Research in Mathematics Education. Prerequisite(s): 3613 or 4023 or equivalent. Examination and critique of research in mathematics education. A comparative study of research design, analysis, and reporting of both qualitative and quantitative research.

MATH 6000* Doctoral Research and Dissertation. 1-9 credits, max 24. Prerequisite(s): Consent of advisory committee. Directed reading and research culminating in the PhD or EdD thesis.

MATH 6010* Advanced Seminar in Mathematics. 1-3 credits, max 12. Prerequisite(s): Consent of instructor and student’s advisory committee. Directed reading on advanced topics in mathematics.

MATH 6143* Functional Analysis I. Prerequisite(s): 4613 or 5003 or 5023, 5153, 5303. Theory of topological vector spaces including metrizability, consequences of completeness, Banach spaces, weak topologies, and convexity.

MATH 6213* Harmonic Analysis. Prerequisite(s): 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.

MATH 6233* Advanced Partial Differential Equations. Prerequisite(s): 5233 or consent of instructor. Schwarz class, tempered distributions, basic linear functional analysis, Holder spaces, Sobolev spaces, spaces involving time, Sobolev inequalities, existence and regularity theory of second-order elliptic, parabolic, and hyperbolic equations, semigroup theory.

MATH 6263* Potential Theory. Prerequisite(s): MATH 5153 and MATH 5293. Subharmonic functions, potential theory, energy problems (including problems with external fields), equilibrium measures, capacities, Dirichlet problems, regularity, Green functions, harmonic measures, conformal mappings, and applications.

MATH 6283* Several Complex Variables. Prerequisite(s): 5293. Elements of function theory of several complex variables, including extension phenomena, domains of holomorphy, notions of convexity, holomorphic maps, and complex analytic varieties.

MATH 6290* Topics in Analysis. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in analysis.

MATH 6323* Algebraic Topology I. Prerequisite(s): 5313. Chain complexes, homology and cohomology groups, the Eilenberg-Steenrod axioms, Mayer-Vietoris sequences, universal coefficient theorems, the Eilenberg-Zilber theorem and Kunneth formulas, cup and cap products, and duality in manifolds.

MATH 6390* Topics in Topology. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in topology.

MATH 6433* Algebraic Geometry. Prerequisite(s): 5623. Affine and projective varieties, dimension, algebraic curves, divisors and Riemann-Roch theorem for curves.

MATH 6453* Complex Geometry. Prerequisite(s): 5283. Complex manifolds, analytic sheaves, differential forms, Dolbeaut cohomology, Hodge theory, line bundles, divisors, Kodaira embedding, and vanishing.

MATH 6490* Topics in Geometry. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in geometry.

MATH 6513* Theoretical Numerical Analysis. Prerequisite(s): 5153, 5543 or CS 5543, and 5553 or CS 5553. An advanced theoretical treatment based on function spaces and operator theory of algorithms for machine computing and analysis of errors.

MATH 6590* Topics in Applied Mathematics. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in applied mathematics.

MATH 6613* Commutative Algebra. Prerequisite(s): 5623. Commutative rings, exactness properties of modules, tensor products, integral dependence, chain figures and tables, completions, filtrations, local rings, dimension theory, and flatness.

MATH 6623* Homological Algebra. Prerequisite(s): 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.

MATH 6690* Topics in Algebra. 1-3 credits, max 9. Prerequisite: consent of instructor. Advanced topics in algebra.

MATH 6713* Analytic Number Theory. Prerequisite(s): 4283 or 5283. Arithmetic functions, Zeta and L functions, distribution of primes and introduction to modular forms.

MATH 6723* Algebraic Number Theory. Prerequisite(s): 5013 or 5623. Number fields, ideal theory, units, decomposition of primes, quadratic and cyclotomic fields, introduction to local fields.

MATH 6790* Topics in Number Theory. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in number theory.

MATH 6813* Lie Groups and Representations. Prerequisite(s): 4153 or 5053, 4613 or 5003, 5303. Differentiable manifolds, vector fields, Lie groups, exponential map, homogeneous spaces, representations of compact Lie groups, and real tori.

MATH 6823* Lie Algebras. Prerequisite(s): 5013 and 5023. Matrix groups, Lie algebras, root systems, structure of semisimple Lie algebras, universal enveloping algebra, and representations of lie algebras.

MATH 6890* Topics in Representation Theory. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in representation theory.

MATH 6923* Research in Undergraduate Mathematics Education. Prerequisite(s): 5913. Continuation of 5913 with an emphasis on design of research in undergraduate mathematics education. Development of research questions, review of the literature, data collection and analysis, development and evaluation of research proposals, reporting research results.

MATH 6990* Topics in Collegiate Mathematics Education. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Advanced topics in collegiate mathematics education.

Mechanical and Aerospace Engineering (MAE)

MAE 3013 Engineering Analysis and Methods I. Prerequisite(s): A grade of "C" or higher in ENGR 1213 and ENGR 2615 and MATH 2233. Set-up and solution of equations which govern mechanical engineering systems. Application and solution of the governing equations to describe the steady state or transient behavior of dynamics, mechanics and circuit problems. Linear sets of equations, ODEs will be used to describe systems. Solutions may be simplified using complex numbers of Fourier/Laplace transforms. Numerical methods for solutions will be covered. Data analysis, quality control and statistical hypothesis testing will be covered.

MAE 3033 Design of Machines and Mechanisms. Prerequisite(s): A grade of "C" or higher in ENGR 1332 and MAE 3013 and MAE 3323. Lecture: Study of the position, velocity, acceleration, and static and dynamic force behavior of machines and mechanisms. Analysis and synthesis of linkages and gear trains. Characteristics and selection of power sources, including electric motors, hydraulics, pneumatics and internal combustion engines. Lab: Machine tool safety. Use of common machine tools to build machine components. Use of lecture concepts in designing, building, and testing machines and mechanisms.

MAE 3113 Measurements and Instrumentation. Prerequisite(s): A grade of "C" or higher in MAE 3013. 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.

MAE 3123 Manufacturing Processes. Prerequisite(s): A grade of "C" or higher
in ENSC 2143 and ENSC 3313. 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.

MAE 3223 Thermodynamics II. Prerequisite(s): A grade of “C” or higher in ENSC 2213. A continuation of ENSC 2213. Irreversibility and availability, power cycles, refrigeration cycles, mixtures and solutions, chemical reactions, phase and chemical equilibrium, and introduction to compressible flow.

MAE 3233 Heat Transfer. Prerequisite(s): A grade of “C” or higher in ENSC 3233. Mechanisms of heat transfer. Steady and transient conduction, free and forced convection, heat exchanger design and analysis, radiation and multiphase behavior. Numerical methods, dimensional analysis and boundary layer theory.


MAE 3293 Compressible Fluid Flow. Prerequisite(s): A grade of “C” or higher in ENSC 2213, ENSC 3233 and MATH 2323. 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 combustion, frictional high-velocity flows and heat addition effects. Two-dimensional ideal fluid flow, stream function, velocity potential, linearized flows and method of characteristics.

MAE 3323 Mechanical Design I. Prerequisite(s): A grade of “C” or higher in ENSC 2113 and ENSC 2413. Introduction to the design process. Consideration of reliability, factor of safety and economics. Use of computer standards, and other design resources. Design stress analysis of mechanical components such as beams, rings, cylinders, and shafts. Analysis of stiffness and deflection of straight and curved beams, columns, and links. Consideration of failure theories for various types of engineering materials. Application of fatigue analyses in the design process.

MAE 3403 Computer Methods in Analysis and Design. Prerequisite(s): A grade of “C” or higher in ENGR 1412 and MAE 3013. Application of linear algebra, numerical methods, statistics, and computer methods in the design, analysis, and simulation of mechanical, thermal, and fluid systems.

MAE 3723 Systems Analysis. Prerequisite(s): A grade of “C” or higher in ENSC 3013. Physical and mathematical modeling of mechanical, electrical, fluid, thermal and mixed dynamic systems. Systems analysis in the time domain and in the frequency domain, with an emphasis on first and second order systems. Laplace transform method for solving ordinary linear differential equations. Representation of system models using transfer functions, block diagrams and state variable forms. Use of computer methods for solving linear and nonlinear dynamic system models.

MAE 4010* Mechanical and Aerospace Engineering Projects. 1-6 credits, max 6. Prerequisite(s): Senior standing in MAE and consent of adviser/instructor. Special projects and independent study in mechanical or aerospace engineering.

MAE 4053* Automatic Control Systems. Prerequisite(s): A grade of “C” or higher in MAE 3723 or ECEN 3723 and admission to MAE professional school. 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. (Same course as ECEN 4413)*

MAE 4063* Mechanical Vibrations. Prerequisite(s): A grade of “C” or higher in MAE 3723 and admission to MAE professional school. 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, whirl, nonlinear effects, and self-excited vibrations.

MAE 4213* Spacecraft Design. Prerequisite(s): A grade of “C” or higher in MAE 3723 and MATH 3223; Admission to MAE professional school. Development of basic aerospace engineering concepts focusing on spacecraft design. Fundamental material will include orbital dynamics, rocket theory and launch vehicle performance, principles of spacecraft stability and control, propulsion systems, spacecraft structures, space environments and its effect on spacecraft design (thermal, radiation, magnetosphere and solar wind), atmospheric reentry, thermal management, power systems, telecommunications, cost analysis, spacecraft design.

MAE 4223* Aerospace Engineering Laboratory. Prerequisite(s): Admission to MAE professional school; and a grade of “C” or higher in MAE 3233 and MAE 3253 and MAE 4283. Experimental study of aerospace principles including topics in aeronautics and astronautics. State-of-the-art instrumentation, diagnostic, and computerized data acquisition equipment and techniques applied to experiments including application of low speed wind tunnel testing techniques, rocket propulsion and control-jet experiments, fundamentals of supersonic nozzles, and flight test evaluation of performance, stability, control, and handling qualities of a propeller-driven airplane.

MAE 4243* Propulsion and Power Systems. Prerequisite(s): A grade of “C” or higher in ENSC 3233 and MAE 3293; admission to MAE professional school. A study of aerospace propulsion. The study of aerodynamic modeling, analysis and propulsive propulsion of a gas as the working fluid. Design and analysis of complete aircraft engine systems and individual components of the aircraft engine. Engine component matching for the rocket propulsion. Using analysis routine including centrifugal and axial flow turbines and compressors, inlets, diffusers, nozzles, fans, and propellers. Additional propulsion and power systems including chemical and non-chemical rocket motors and other internal combustion and electric motors.

MAE 4263* Energy Conversion Systems. Prerequisite(s): A grade of “C” or higher in MAE 3230 and MAE 3223; admission to MAE professional school. This course covers the use of renewable and non-renewable energy sources in power production. Energy conversion processes are analyzed, and performance characteristics of components and systems are modeled using modern computational methods. Applications include design of conventional Rankine power systems and may also include design of nuclear, solar, wind, wave, thermoelectric, and geothermal energy systems.

MAE 4273* Experimental Fluid Dynamics. Prerequisite(s): A grade of “C” or higher in MAE 3113 and ENSC 3233; admission to MAE professional school. Experimental study of basic and applied fluid dynamics systems with computations. Fluid dynamics instrumentation, data acquisition and processing, design of facilities and experiments, technical report writing and design project with experimental verification.


MAE 4313* Advanced Processing of Engineered Materials. Prerequisite(s): A grade of “C” or higher in ENSC 3313 and admission to MAE professional school. Introduction of novel processing methods for a range of engineered materials, such as electro-slag remelting, vacuum melting, melting to remove trace elements, precision casting, sintering, hot-pressing, hot-extrusion, solidification, mechanical alloying, liquid infiltration, net-shaped finishing, superplastic forming, sol-gel processing, float glass process, tape laying, microwave processing, laser processing, CVD and PVD, sputtering, ion plating, ultrasound machining and grinding, polishing and lapping, multilayer coatings, Czochralski single crystal growth, processing of nanocrystalline materials, engineered surfaces and surface modification, and layer processing for electronic materials.

MAE 4333* Mechanical Metallurgy. Prerequisite(s): A grade of “C” or higher in ENSC 3313 and admission to MAE professional school. Mechanical deformation processes and strengthening mechanisms in engineering materials. Material failure modes including creep, fatigue, stress corrosion, ductile and brittle fractures.

MAE 4342* Design Projects I. Prerequisite(s): A grade of “C” or higher in MAE 3113, MAE 3233 and MAE 3323; Admission to MAE professional school. Two-semester design project with team format. Projects are sponsored by a company, agency, or individual. Team members work with sponsors and faculty who serve as mentors in fields related to their topics. Students complete oral presentations, progress reports, and written document their activities and contributions. Topics include safety, patent law, product liability, report writing, and scheduling.

MAE 4344* Design Projects. Prerequisite(s): A grade of “C” or higher in MAE 3113, MAE 3233 and MAE 3323; Admission to MAE professional school. Students work in small teams on a semester-long design project sponsored by a company, agency, or individual. Team members work with mentors from sponsors and with faculty members in fields related to their topics. Presentations on safety, patent law, product liability, report writing, oral presentations, scheduling and idealization. Oral presentations, progress report and professional log book documenting personal activity and contributions.

MAE 4352 Design Projects II. Prerequisite(s): A grade of “C” or higher in MAE 4342; Admission to MAE professional school. Second of two-semester sequence of senior design courses.

MAE 4353* Mechanical Design II. Prerequisite(s): A grade of “C” or higher in MAE 3323; Admission to MAE professional school. 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.

MAE 4354* Aerospace Systems Design for Mechanical Engineers. Prerequisite(s): A grade of “C” or higher in MAE 3113, MAE 3233 and MAE 3323; Admission to MAE professional school. Multidisciplinary design of aerospace vehicles. Multidisciplinary teams that work on a semester-long project that includes the design, construction, and a flight test of an aerospace...
vehicle optimized for a given set of requirements. Teamwork, leadership and presentation skills emphasized. Students from all appropriate disciplines who wish to participate in this course are encouraged to do so by enrolling in MAE 4010.

MAE 4513* Aerospace Structures I. Prerequisite(s): A grade of “C” or higher in MAE 3233 and admission to MAE professional school. Design and analysis of flight structures. Topics from two and three-dimensional elasticity. Behavior of composite materials. Stress and deflection analysis of thin-skinned stiffened structures. Introduction to the finite element method and its applicability in the design process.

MAE 4623* Biomechanics. Prerequisite(s): A grade of “C” or higher in MATH 2163, ENSC 2143 and ENSC 3233; Admission to MAE professional school. To introduce non-biengineering students to the field of biomechanics. This class will serve as a foundation for further biomechanics investigations at the senior undergraduate and graduate level. At the end of this class students will be able to apply engineering principles to describe the mechanical properties of biological systems.

MAE 4703* Design of Indoor Environmental Systems. Prerequisite(s): A grade of “C” or higher in MAE 3223 and MAE 3233; Admission to MAE professional school. Design of heating, ventilating and air conditioning systems. Calculation of heating and cooling loads.

MAE 4713* Thermal Systems Design, Simulation and Optimization. Prerequisite(s): A grade of “C” or higher in ENSC 3233, MAE 3233, MAE 3223 and MAE 3403; Admission to MAE professional school. Design, modeling, simulation and optimization of thermal systems. Analysis and modeling of components such as fans, pumps, ducts, pipes, fittings, heat exchangers, compressors, thermal storage equipment.

MAE 4733* Mechatronics Design. Prerequisite(s): A grade of “C” or higher in MAE 3223 and MAE 3233; Admission to MAE professional school. Design of mechanical and electrical components, including sensors and actuators into an integrated environment using microcontrollers. Software design using an easy-to-program microcontroller embodies the importance of software implementation into the overall engineering system. Design practice with given design projects to build up skills plus an open-ended term design project of the student’s choosing.

MAE 5000* Master’s Thesis. 1-9 credits, max 9. Prerequisite(s): Graduate standing in MAE and consent of student’s adviser. A student studying for a master’s degree who wishes to write a thesis must in this course.

MAE 5003* Advanced Biomaterials Science and Engineering. Prerequisite(s): Graduate standing or consent of instructor. Engineering issue that are implicit in understanding the interactions of living tissue and processed materials will be introduced. Emphasis is on identifying the processes in which cells interact with surfaces and particulate matter and the outcome of these interactions. Highlighted biological responses will include inflammation and coagulation. Also, biomaterial issues related to drug delivery and tissue engineering will be discussed. (Same course CHE 5263)

MAE 5010* Mechanical and Aerospace Engineering Projects. 1-8 credits, max 8. Project in research assigned by the student and approved by the student’s adviser. This course may also be used as a temporary number for new graduate course offerings (3 credit hours).

MAE 5013* Physiological System Analysis for Engineers. Prerequisite(s): Graduate standing or consent of instructor. Introduce the basic physiology concepts used widely in biomedical engineering research; and introduce and develop engineering concepts and approaches for quantitative analysis of physiological systems. Engineering principles of mechanical properties of various tissue and organ systems under normal and diseased conditions. (Same course CHE 5273)

MAE 5023* Advanced Biofluid Mechanics. Prerequisite(s): Graduate standing or 3233 (or equivalent). From sub-cellular to the organism level, life is supported by mass transfer processes, which encompass everything from free diffusion to the convection of bulk fluids. Therefore, to understand the body’s functions, it is necessary to understand both fundamental fluid mechanics and heat transfer to physiological systems. Special emphasis will be placed on different length scales in physiological system, biorehology, conservation laws, mechanical coupling to vessel deformation and relevant physiology.

MAE 5030* Engineering Practice. 1-12 credits, max 12. Prerequisite(s): Graduate standing in MAE and consent of student’s adviser. Solution of real-life engineering design and development problems in an actual or simulated industrial environment. Activities include application of design and testing procedures, economic evaluation and periodic oral and written reporting on ongoing or previously assigned problems. Activities must be approved in advance by the adviser.

MAE 5033* Advanced Biomedical Engineering. Prerequisite(s): Consent of instructor. Principles and engineering analysis of biomedical processes. Artificial organs, biomaterials, tissue engineering, transport in biological systems, biomaterials, biomedical imaging and drug delivery systems. (Same course as CHE 5293)

MAE 5053* Design of Engineering Experiments. Prerequisite(s): Graduate standing. The purpose of this course is to teach graduate students how to apply statistical methods to the solution of biological and engineering problems. They will learn how to use statistical methods to design experiments, present and analyze data, and interpret experimental data.

MAE 5063* Soft Tissue Mechanics. Prerequisite(s): 3323 or an equivalent course with the consent of the instructor. Introduction to the most commonly used computational techniques for investigating and analyzing the behavior of biological soft tissues. Application of computational methods such as elasticity, viscoelasticity, and poroelasticity for numerically modeling the properties of biomaterials.

MAE 5073* Advanced Mechanical Vibrations. Prerequisite(s): 4063 or consent of instructor. Analysis of nonlinear vibrations, classical analysis of continuous systems and numerical methods.

MAE 5083* Engineering Acoustics. Prerequisite(s): Graduate standing or consent of instructor. Acoustic analysis and measurement techniques, with emphasis on design applications for noise and vibration control in machinery and in buildings.

MAE 5093* Numerical Engineering Analysis. Prerequisite(s): Undergraduate course in computer programming and consent of professor. Practical digital methods for obtaining steady-state and transient solutions to lumped and distributed mechanical, fluid and thermal problems.

MAE 5113* Diffraction in Materials. Prerequisite(s): Graduate standing or consent of instructor. Introduction to crystallography and diffraction with an emphasis on X-Ray diffraction, some exposure to Neutron diffraction, X-ray and electron tomography. The course will focus on mechanical properties measurements. New methods will be surveyed with an emphasis on current research. (Same course as MSE 5113*).

MAE 5123* Advanced Material Removal Processes. Prerequisite(s): ENSC 3313 and MAE 3233 and graduate standing or consent of instructor. 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 machining, dynamometry; 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.

MAE 5133* Mechanical Behavior of Materials. Prerequisite(s): ENSC 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.

MAE 5143* Tribology. Prerequisite(s): Graduate standing or consent of instructor. The principles of tribology. Definition of tribology: contact of solids, surface topography, real area of contact, friction of various materials, basic mechanisms of friction, mechanisms of wear (adhesion, abrasive, fatigue, erosion, and fretting), hardness of solids, frictional heating and sliding temperatures, material properties that influence surface interactions, surface roughness measurement, surface integrity residual stresses and subsurface deformation, applications of tribology to manufacturing, wear resistant materials, wear-resistant coatings, experimental methods in tribology, surface analytical tools in tribology, scanning tunneling microscopy/atomic force microscopy, wear monitoring and wear prevention, and systems approach to tribology.

MAE 5153* Precision Engineering I. Prerequisite(s): Graduate standing or consent of instructor. An integrated approach to understanding the rules and principles governing product and process designs requiring accuracies typically better than 1 part in 106. Design and control of precision machines and instruments, dimensional surface metrology, scanning probe microscopy, ultra-precision machining and grinding, and precision assembly.

MAE 5163* Precision Manufacturing Process. Prerequisite(s): MAE 3123 or equivalent. Introduction to precision manufacturing, design principles of precision machine tools and source of errors, diamond turning and milling, grinding, polishing and lapping, sensors for precision manufacturing, precision manufacturing applications.

MAE 5183* Nanostructured Materials. Prerequisite(s): Graduate standing and basic undergraduate materials science course or equivalent. Size and shape dependence of material properties at the nanoscale. Interaction, surface energy, functionalization, binding, and immobilization of nanostructures. Top-down and bottom-up nanofabrication, atomic processes and self assembly. Lithography, thin films, functional coating, Langmuir-Blodgett films, layer-by-layer
growth. Properties, applications and synthesis of well-studied building blocks; quantum dots (semiconductor nanocrystals), carbon nanostructures (nanotubes and fullerenes), semiconductor nanowires, metal nanoparticles and nanowires.


MAE 5253* Multiphase Flow. Prerequisite(s): Graduate standing. Theory, methods and practical experience for studying complex transient multiphase flows: basic concepts and definition, dynamics of bubbles, drops and rigid particles, gas-liquid transport in ducts, fluid-solid transport in ducts, aerosol and spray systems, foam, fluidization, particle separation systems multiphase flow in porous media, breakup of liquid sheets and jets, modeling, advanced experimental techniques for multiphase flow.

MAE 5273* Advanced Fluid Dynamics II. Prerequisite(s): 5233. Application of advanced fundamental concepts and methods to vorticity dynamics, gravity waves, instability, and an introduction to turbulence. Turbulence topics (e.g. geophysical flows, compressible flows, biofluids) will also be discussed.

MAE 5353* Testing, Control, and Simulation of Thermal Systems. Prerequisite(s): MAE 3223 or equivalent. This course introduces the usage of computer software for the simulation and experimental testing of thermal systems and their components. Specifications of sensors and test plans based on uncertainty calculation as well as HVAC controls are introduced.

MAE 5403* Computer-Aided Analysis and Design. Prerequisite(s): Undergraduate course in computer programming and consent of professor. Theory and application of digital-computer-oriented algorithms for the simulation, analysis and design of engineering systems. Advanced FORTRAN methods for optimization, simulation and data analysis. Implementation of these methods uses program libraries, batch processing, remote terminals and graphic display units.

MAE 5413* Optimal Control. Prerequisite(s): 5713 or ECEN 5713. Optimal control theory for modern systems design. Specification of optimum performance indices. Dynamic programming, calculus of variations and Pontryagin’s minimum principle. Iterative numerical techniques for trajectory optimization. (Same course as ECEN 5413)

MAE 5433* Robotics, Kinematics, Dynamics and Control. Prerequisite(s): 4053 or ECEN 4413 or consent of instructor. Kinematic and dynamic analysis of robot manipulators. Inverse kinematics, motion planning and trajectory generation. Industrial practice in robot servo control. Dynamics and control in the presence of constraints. Actuators and sensors. Force sensors and vision systems. Robotic force control and its applications in industry. Passivity based control algorithms. Advanced control techniques for motion and force control. (Same course as ECEN 5433)

MAE 5463* Nonlinear System Analysis and Control. Prerequisite(s): 4053 or ECEN 4413. Fundamentals for the simulation and experimental testing of nonlinear systems and components. Approximate methods in discrete-time representation. Stability methods. Controllability, observability, state estimation, and parameter identification. Design and analysis of feedback control system using frequency-domain and state-space methods. Introduction to optimal control. (Same course as ECEN 5473)

MAE 5483* Advanced Mechatronics Design. Prerequisite(s): 4743 or similar course and consent of instructor. Continuation of topics covered in the undergraduate course MAE 4743 Mechatronics Design. Optimizing C programming code for microcontrollers using the Atmel microcontroller and the ARM architecture. Analysis of the system, the control system, the embedded system, and the software implementation. (Same course as ECEN 5463)

MAE 5503* Mechanics of Advanced Composites for Structural Design. Prerequisite(s): ENSC 2113, ENSC 2143 or consent of instructor. Basic principles governing the mechanics of a lamina, and the macro-mechanics of a laminate are discussed in detail. Analysis of the continuous fiber, short fiber, and woven-fiber polymer matrix composites. A computer program for a analysis and design of composite laminates is developed.

MAE 5513* Stochastic Systems. Prerequisite(s): ENSC 3513 and 4503 or STAT 4033 or MAE 4053 or MAE 4063 or consent of instructor. Theory and applications involving probability, random variables, functions of random variables, and stochastic processes, including Gaussian and Markov processes, Correlation, power spectral density, and non-stationary random processes. Response of linear systems to stochastic processes. State-space formulation and covariance analysis. (Same course as ENSC 5513)

MAE 5523* Estimation Theory. Prerequisite(s): 5513 or ENSC 5513. Stochastic model development, parameter estimation and state estimation. The linear model, model order determination, least squares, estimation, maximum likelihood estimation, Bayesian estimation. Gaussian random vectors, estimation in linear and Gaussian models, state estimation, the Kalman filter, prediction and smoothing. (Same course as ECEN 5523)

MAE 5533* Theory of Elasticity. Prerequisite(s): 3233 or consent of instructor. Basic concepts of stress, strain, and failure in solids. Stress analysis, compatibility, equilibrium, and constitutive relations. Continuum mechanics of solids. Plates and shells. Elasticity, plasticity, and composite structures.


MAE 5553* Fatigue and Fracture Mechanics. Prerequisite(s): 4333 or consent of instructor. Fracture processes in engineering materials including design considerations, failure avoidance and predictability. Fatigue processes and high-strength, toughness-limited materials.

MAE 5563* Finite Element Methods. Prerequisite(s): Graduate standing or consent of instructor. Introduction to the finite element method for structural engineering. Numerical and mathematical formulations including an introduction to variational methods. Computer applications in solid mechanics, heat transfer and fluid mechanics.


MAE 5583* Corrosion Engineering. Prerequisite(s): ENSC 3313 or equivalent. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service. (Same course of MFE 5583)

MAE 5593* Theory of Viscoelasticity. Prerequisite(s): Consent of instructor. Advanced theory of linear viscoelastic solids exhibiting time-dependent behavior. Material characterization and thermodynamic foundation of the constitutive behavior of time-dependent materials such as polymers, solid propellants and metals near their melting points; time-temperature; superposition principle for thermo-rheologically simple materials; correspondence principle for linear viscoelastic and associated linearly elastic solutions; integral formula for quasistatic boundary value problems; treatment of time-varying boundary conditions such as moving boundaries and moving loads; linearly viscoelastic stress waves and approximate methods of linearly viscoelastic stress analysis.

MAE 5603* Stability of Structures. Prerequisite(s): Graduate standing or consent of instructor. Stability is a fundamental problem in solid mechanics, which is crucial to the safety of structures against collapse. The theory of stability is of great importance for structural engineering, aerospace engineering, and civil engineering. Elastic and non-elastic theories of stability will be discussed for structures such as columns, frames, thin-walled beams, plates and shells. Energy methods for discrete and continuous structures will also be discussed.

MAE 5633* Advanced Thermal Systems. Prerequisite(s): 3223, 3233, ENSC 3253. Analysis, design, simulation and optimization of thermal systems. Engineering applications to HVAC systems, refrigeration systems, ground-source heat pump systems.

MAE 5653* Refrigeration. Prerequisite(s): 3223. Thermal engineering of refrigeration and heat pump systems, vapor compression systems, absorption refrigeration cycles, cryogenics, compressors, heat exchangers, flow control devices, laboratory simulators and measurements, socioeconomics and environmental impact of systems and refrigerants. A general-purpose computer software program is used for analysis and design of several refrigeration systems and components.


MAE 5673* Mechanics of Fracture, Contact and Friction. Prerequisite(s): Graduate standing or consent of instructor. Rigorous derivation and presentation of the equations of fracture mechanics, contact and friction. Equations of solid mechanics and mathematical preliminaries, elastic stress field near a crack tip, stress intensity factors, fracture toughness, Griffith solution and J-integral, elastic-plastic fracture, fatigue, Dugdale model and cohesive zone laws, experimental techniques in fracture mechanics, contact mechanics,
friction modeling. More advanced topics and projects will be chosen from interfacial crack growth, subsonic and transonic dynamic fracture, rate- and state-dependent friction laws, fracture and friction at the small scales (nanomechanics), and finite-element analysis using commercial packages.

MAE 5683* Thermodynamics and Thermostatics of Materials. Prerequisite(s): ENSC 3131 or equivalent. Notions of energy, entropy, equilibrium, macroscopic and microscopic; their relation to materials and processes and properties. Deriving material properties from equations of state: Maxwell relations. Statistical thermodynamics: predicting material properties from microscopics of function. Phase transformations. Thermodynamics of surfaces and defects. Electrochemistry. (Same course as MSE 5683*)

MAE 5693* Phase Transformations in Materials. Prerequisite(s): Graduate standing or consent of instructor. Principles of phase transformations in material. Structure of materials, phase diagrams, diffusion, solidification, and diffusional and diffusionless transformations will be covered. Recent developments in materials research relevant to phase transformations (Same course as MSE 5693*)

MAE 5703* Optimization Applications. Prerequisite(s): Graduate standing. A survey of various methods of unconstrained and constrained linear and non-linear optimization. Applications of these methodologies using hand-worked examples and available software packages, intended for engineering and science students. (Same course as CHE 5703*, ECEN 5703* & IEM 5023*)

MAE 5713* Linear Systems. Prerequisite(s): Graduate standing or consent of instructor. Introduction to the fundamental theory of finite-dimensional linear systems with emphasis on the state-space representation. Mathematical representations of linear systems: state equations; linear systems: controllability, observability, and stability; linearization and realization theory; and state feedback and state observer. (Same course as ECEN 5713*)

MAE 5733* Neural Networks. Prerequisite(s): Graduate standing. Introduction to mathematical analysis of networks and learning rules, and on the application of neural networks to certain engineering problems image and signal processing and control systems. (Same course as CHE 5733* & ECEN 5733*)

MAE 5753* Advanced Experimental Mechanics of Solids. Prerequisite(s): 5573 or consent of instructor. Application of advanced experimental mechanics techniques to investigate and characterize response of solid materials. Course material includes use of at-a-point and full-field techniques, characterizing rate- and time-dependent material response, and techniques for finite deformation.

MAE 5763* Wave Motion and Vibrations of Continuous Media. Prerequisite(s): 5573 or consent of instructor. Fundamentals of the formulation and solution of the problem of wave motion and vibration in continuous media. Propagation of stress waves and the implication of high-rate loading on mechanics problems.

MAE 5773* Intelligent Systems. Prerequisite(s): 5733 or ECEN 5733. Introduction to the state-of-the-art intelligent control and system successfully deployed to industrial and defense applications. Emerging intelligent algorithms (e.g., bottom-up, top-down, semiotics); reinforcement learning and hybrid systems; and case studies and design projects. (Same course as ECEN 5773*)

MAE 5783* Principles of Autonomous Decision Making. This course will provide a detailed overview of the fundamental principles of autonomous decision making and their applications to various engineering and computer science domains. The course will survey decision models in reasoning and perception as well as optimal decision making methodologies. Learning and reasoning paradigms include support vector machines, Gaussian Processes, and Bayesian Nonparametric Learning. Optimal decision making techniques include Markov Decision Processes, Planning and reinforcement learning.

MAE 5803* Advanced Thermodynamics I. Prerequisite(s): 5223. A rigorous examination of the fundamental principles of engineering thermodynamics to include the First Law, Second Law and availability, thermodynamics equations of state for single phase and multi-phase systems, chemically reactive systems, and equilibrium. A general-purpose computer software program is used for examination of case studies of thermodynamic processes.

MAE 5813* Intermediate Heat Transfer. Prerequisite(s): 3223 or equivalent. Continuation of the topics covered in the undergraduate heat transfer course (3223) with the addition of mass transfer. This course covers problems of heat and mass transfer in greater depth and complexity than is done in the undergraduate heat transfer course and incorporates the subjects that are not included or are treated lightly in that course. Analysis will be given greater emphasis than analytical correlations.

MAE 5823* Radiation Heat Transfer. Prerequisite(s): 3223 or equivalent and graduate standing or consent of instructor. The mechanism of the transfer of energy by thermal radiation; radiant properties of materials, energy transfer prediction methods and solar energy topics.

MAE 5843* Conduction Heat Transfer. Prerequisite(s): ENSC 3233. Advanced heat transfer analysis and design, with primary emphasis on conduction problems of practical interest. A general-purpose computer program used to demonstrate the capabilities of the numerical method through a wide variety of engineering problems.


MAE 5873* Advanced Indoor Environmental System. Prerequisite(s): 4703. Heating, air-conditioning, ventilation and refrigeration systems. System and component analysis, design and simulation.

MAE 5913* Advanced Aerodynamics. Prerequisite(s): ENSC 3233 or equivalent. Aerodynamics of slender, transonic, supersonic, and hypersonic flow regimes. Derivation of governing equations and fundamental principles. Analytical and computational analysis methods. Recent developments.

MAE 5923* Guidance and Control of Aerospace Vehicles. Prerequisite(s): 4653 or ECEN 4413 or equivalent. Navigation, guidance and attitude control of aircraft, launch vehicles and spacecraft. Inertial navigation mechanisms and error analysis. Stability augmentation systems.

MAE 5933* Aeroelasticity. Prerequisite(s): Graduate standing or consent of instructor. Interaction between fluid dynamic, inertial and elastic forces. Development of analytical and computational methods for analysis. Application to a broad range of problems in engineering.

MAE 5943* Unsteady Aerodynamics and Aeroacoustics. Prerequisite(s): ENSC 3233 or equivalent. Development of governing fluid dynamic equations for unsteady flows; linear unsteady aerodynamics for isolated and cascaded lifting surfaces; three-dimensional shock and bound generation from isolated airfoils, cascaded airfoils, rotor-stator interactions, multiple pure-tone sources, propellers and jets.

MAE 5953* Aerospace Systems Engineering. Prerequisite(s): 3253 or equivalent. Aircraft and spacecraft design from a systems perspective, including basic systems engineering, cost and weight estimation, basic vehicle performance and trade study analysis, safety and reliability, lifecycle analysis, subsystem integration, risk analysis and management, system realization, and multi-disciplinary optimization (MDO). Additional topics include requirements identification and development, and program planning and control.

MAE 5963* Unmanned Aerial Systems Design and Analysis. Prerequisite(s): Graduate standing or permission of instructor. This course covers concepts related to design and operation of unmanned systems focusing on unmanned aircraft, including remotely piloted and autonomous vehicles. History of unmanned systems. Design of unmanned air systems including concepts of operations, communications, payloads, control and navigation, multiple air vehicle architectures, cooperative control and ISR. Design requirements for unmanned versus manned vehicles. Operation in conflicted airspace. Aspects of other unmanned systems, including ground, surface, underwater and space vehicles.

MAE 5973* Unmanned Aerial Systems Propulsion. Prerequisite(s): Graduate standing or permission of instructor. This course will cover propulsion topics used on Unmanned Aerial Systems (UAS). These will include: Historical perspective on UAS propulsion systems; Classification of propulsion types; Propulsion requirements for UAV; Propeller performance and design; Internal combustion engine; Heavy-Fuel ICE; ICE Muffler design; Electric motor; Hybrid-Electric engine; Fuel Cell engine; Flaping Wing propulsion; Jet engine; Propulsion integration and emergency ducting effects.

MAE 5983* Aircraft Certification and Test. Prerequisite(s): Graduate standing or consent of instructor. Exploration of the major engineering processes for airworthiness certification of manned and unmanned aircraft. Assessment of civil and military airworthiness regulations and their impact on certification program management and testing. Development of foundational concepts and processes for laboratory, ground and flight testing for airworthiness.

MAE 5993* Microstructural Mechanics. Prerequisite(s): Graduate standing or consent of instructor. Build a framework to understand the various microstructures of materials with their respective roles in controlling mechanical properties. Grain size, orientation, surface facets, compositional gradients, and second or multiple phases, in combination with the three-dimensional arrangement of the various types of imperfections, together constitute the microstructure of a material. An emphasis will be placed on new research areas and to exposure to methods and programs for microstructure developments.

MAE 6000* Doctoral Dissertation. 1-15 credits, max 30, Prerequisite(s): Admission to MAE PhD program and consent of the student’s dissertation adviser. Independent research under the direct supervision of the student’s doctoral dissertation adviser.

MAE 6010* Advanced Study. 1-12 credits, max 12. Prerequisite(s): Approval of the Graduate Program advisory committee. Study and investigation under the supervision of a member of the faculty along lines of interest well advanced of and supported by the 5000-series courses.

MAE 6123* Advanced Processing of Materials. Prerequisite(s): Graduate standing or consent of instructor. Rational for non-traditional machining; various non-traditional machining processes, including electro-discharge machining, electro-chemical machining, plasma arc-, microwave-, and laser assisted processing, waterjet (abrasive) cutting, ultrasonic machining, chemical machining, thermal assisted processing and electron beam machining.

MAE 6133* Surface Mechanics. Prerequisite(s): Consent of instructor. Models
and solutions basic to surface studies. Equations of continuum mechanics, thermal field solutions at sliding interfaces, elasticity, plasticity. Applications of solution techniques to surface, surface layer and interface phenomena.

MAE 6143* Thermal Analysis of Manufacturing Processes. Prerequisite(s): Graduate standing and consent of instructor. Thermal analysis of various moving heat source problems encountered in a variety of manufacturing processes, including machining, grinding, polishing, casting, welding, energy beam cutting and other tribological applications such as meshing of gears, cams, bearings. Analysis of both transient and steady state conditions.

MAE 6233* Turbulent Fluid Dynamics. Prerequisite(s): 5233. Isotropic turbulence, turbulent wakes and jets, bound turbulent shear flows, transition, hydrodynamic stability and integral calculation methods for turbulent boundary layers.

MAE 6263* Computational Fluid Dynamics. Prerequisite(s): Graduate standing and S233. Steam function-vorticity and pressure-velocity simulations of incompressible and compressible flows. Temperature and concentration solutions. Applications to various external and internal flow problems.

MAE 6423* System Identification. Prerequisite(s): 5473 or 5713 or ECEN 5473 or ECEN 5713. Linear and nonlinear system modeling of random systems. Models of linear time-invariant systems, nonparametric methods and preliminary model development, parameter estimation methods, convergence and consistency, asymptotic distributions of parameter estimates, nonlinear modeling. (Same course as ECEN 6423*)

MAE 6453* Adaptive Control. Prerequisite(s): 5473 or ECEN 5473 or ECEN 5713 or MAE 5713. Analysis and design of control techniques which modify their performance to adapt to changes in system operation. Review of systems analysis techniques, including state variable representations, linearization, discretization, covariance analysis, stability, and linear quadratic gaussian design. On-line parameter estimation, model reference adaptive systems, self-tuning regulators, stable adaptive systems. (Same course as ECEN 6453*)

MAE 6463* Advances in Nonlinear Control. Prerequisite(s): MAE 5463 or ECEN 5463. Introduction to vector fields and Lie algebra controllability and observability of nonlinear systems; local decompositions; input-output systems; feedback linearization; controlled invariance and distribution; control of Hamiltonian systems.

MAE 6483* Robust Multivariable Control Systems. Prerequisite(s): 5713 or ECEN 5713. Introduction to multivariable systems: SISO robustness vs. MIMO robustness; multivariable system poles and zeros; MIMO transfer functions; multivariable frequency response analysis; multivariable Nyquist theorem; performance specifications; stability of feedback systems; linear fractional transformations; parameterization of all stabilizing controls of a structurally singular value; algebraic riccati equations; H2 optimal control; H-infinity controller design. (Same course as ECEN 6483*)

MAE 6843* Convection Heat Transfer. Prerequisite(s): 5233 or equivalent. Advanced convective heat transfer in laminar and turbulent flows over external surfaces and inside channels. Heat transfer at high velocities, free convection boundary layers, and mass transfer.

Mechanical Engineering Technology (MET)

MET 1103 Introduction to Mechanical Engineering Technology. Lab 2. Introduction to mechanical engineering technology, analytical techniques, and data presentation. Orientation to the mechanical engineering technologist's profession.

MET 1213 Manufacturing Processes. Lab 3. Basic methods and processes of fabrication with emphasis on materials, metrology and conventional machining. Previously offered as GENT 1223.

MET 1223 Industrial Computer-Aided Design. Lab 2. Prerequisite(s): Grade C or better in GENT 1153. Computer-aided design (CAD) generation of engineering drawings including three-dimensional product design and modeling.

MET 2103 Industrial Materials. Prerequisite(s): CHEM 1314 or CHEM 1215 or CHEM 1414. A study of the properties, characteristics and applications of metals, polymers, ceramics and other industrial materials. Terminology, concepts and principles involved in material selection, specification and processing. Laboratory activities include data collection and report generation, determination of material properties, and evaluation of material characteristics.

MET 2313 Fundamentals of Hydraulic Fluid Power. Lab 2. Prerequisite(s): PHYS 1114 or 2014. Basic fluid power concepts. Standard hydraulic symbols, component design and application, fluid power system considerations, design and operation.

MET 3003 Dynamics. Prerequisite(s): Grade C or better in GENT 2323 or ENSC 2113. Planar motion of particles and rigid bodies. Force-acceleration, work-energy, and impulse-momentum principles. Graphical analysis, mechanisms and vibrations.

MET 3113 Basic Instrumentation. Lab 2. Prerequisite(s): MATH 2123 or MATH 2144 and Grade C or better in GENT 3323 or ENSC 2143. Data analysis, theory, operational characteristics and application of transducers for measurement of strain, force, velocity, acceleration, displacement, time, frequency, temperature, pressure.

MET 3313 Applied Fluid Mechanics. Prerequisite(s): MATH 2123 or MATH 2144 and Grade C or better in GENT 2323 or PHYS 2114 and Grade C or better in GENT 2323 or ENSC 2143. Study of fluid systems including static forces, the Bernoulli and general energy equations, laminar and turbulent flows, measurements of flow and pressure, lift and drag, pumps, fans.

MET 3343 Physical Metallurgy. Lab 3. Prerequisite(s): Grade C or better in MET 2103. Analysis and evaluation of the properties of metals commonly used in mechanical design. Properties change caused by heat treatment, and phase transformations. Applications of heat treatment. Laboratory activities including metallographic specimen preparation, inspection and testing; and standard tests of tensile properties, hardness, brittleness and toughness.

MET 3413 Fundamentals of Pneumatic Fluid Power. Lab 2. Prerequisite(s): Grade C or better in MET 2313. Basic pneumatics concepts, gas laws, component design and application, system design considerations. Air logic.

MET 3423 Intermediate Hydraulic Fluid Power. Prerequisite(s): Grade C or better in MET 2313. Review of fundamentals of hydraulic fluid power. Energy-efficient hydraulic systems, cartridge valves, dynamics of hydraulic systems, special topics associated with mobile hydraulic equipment.

MET 3573 Advanced Production Processes. Lab 3. Prerequisite(s): Grade C or better in GENT 1223 and MET 1223. Advanced manufacturing and production processes including polymers and plastics, powder metallurgy, foundry, welding and metal forming. Design for assembly (DFA) and design for manufacture (DFM).

MET 4003 Machine Design I. Prerequisite(s): MATH 2123 or MATH 2144 and Grade C or better in GENT 3323 or ENSC 2143. Analysis of statics and strength to the design of machine components. Problems of choosing materials, impact and fatigue loading.

MET 4013 Parametric Computer-Aided Modeling. Lab 2. Prerequisite(s): Grade C or better in MET 1223. Computer-aided drafting and design using parametric, feature-based solid modeling techniques.

MET 4023 Advanced Mechanical Computer-Aided Design. Lab 2. Prerequisite(s): Grade C or better in MET 1223. Computer-aided design methodologies and processes. State-of-the-art technologies and methodologies in 3D modeling and design processes.

MET 4033 Applied Vibration and Acoustics. Prerequisite(s): Grade C or better in MET 3003 or ENSC 2123. Free and forced vibration of mechanical systems with an emphasis on practical applications. Introduction to sound wave generation and propagation. Mechanical system design methods for noise and vibration mitigation.

MET 4050 Advanced Mechanical Design. 1-3 credits, max 6, Lab 0-2. Prerequisite(s): junior standing and consent of instructor. Special problems in mechanical engineering technology.

MET 4113 Practical Computational Fluid Dynamics. Prerequisite(s): Grade C or better in MET 3313 or ENSC 3233. An introduction to the practical use of Computational Fluid Dynamics (CFD) commercial software. Students will be introduced to the concepts governing CFD, but the majority of the class will be utilized in learning the use of a popular commercial code.

MET 4123 Senior Design Projects. Lab 6. Prerequisite(s): MET 4001, ENGL 3323 (can be concurrent enrollment in ENGL 3323) and Grade C or better in MET 1223. Selected problems in design integrating principles of drafting, analysis, design, and grade C or better in MET 3323. Design and applications. Materials and manufacturing. Design projects are typically supplied by industry.

MET 4203* Finite Element Methods. Prerequisite(s): Grade C or better in GENT 3323 or ENSC 2143. Application of Finite Element Methods to mechanical component design. Problems involving stress, strain, temperature and vibration will be solved using state of the art Finite Element Software.

MET 4303 Computer Integrated Manufacturing. Lab 2. Prerequisite(s): Grade C or better in GENT 1223 and MET 1223. Introduction to programming techniques and manufacturing applications of computer numerical control (CNC) and robotics. Machine capabilities and tooling requirements with programs being prepared manually and with COMPACT II computer assistance.

MET 4313 Electrohydraulics Motion Control. Lab 2. Prerequisite(s): Grade C or better in MET 2313 and EET 3104. Principles of electronics as applied to fluid power controls. Trends in modern fluid power systems. Solenoid systems, proportional control, servosystems, programmable controllers, and robotics. Lab includes design, fabrication and operation of practical systems.

MET 4413 Ground Source Heat Pump Systems. Prerequisite(s): GENT 4433 and Grade C or better in MET 3313 and GENT 4343. Design and applications of ground sourced heat pump systems. Heat pump performance, borehole heat transfer, pressure loss calculations and installation methods.

MET 4453 Applied Thermodynamics. Prerequisite(s): Grade C or better in MET 2313 or ENSC 2313. Mixtures, psychrometrics, combustion, heat transfer, pressure loss calculations and installation methods.

MET 4463 Thermal Fluids Laboratory. Prerequisite(s): Grade C or better in MET 3313 or ENSC 3233. GENT 4343 or ENSC 2213 and prerequisite or concurrent enrollment in GENT 4343. Prerequisite: enrollment in GENT 4433. Experimental study of topics in fluid mechanics, thermodynamics, and heat transfer. Interpretation of experimental data and technical report writing.

MET 4503 Petroleum Operations. Prerequisite(s): Grade C or better in GENT
2323 or ENSC 2113. An introduction to the petroleum industry and available careers is presented for all engineering technology disciplines. Coverage includes basic petroleum geology, drilling, well completions, producing equipment, field operations, blowout recovery procedures, and transportation of hydrocarbons along the flow path from reservoir to the refinery.

MET 4833 Tool Design. Lab 3. Prerequisite(s): Grade C or better in MET 2213 and MET 3343. Basic design and development of special tools for processing or manufacturing engineering materials. Design and specification and inspection tools using appropriate techniques of engineering graphics and analysis.

MET 4993 Mechanical Engineering Technology Practice. Prerequisite(s): Junior standing and consent of department head. Supervised industrial experience in mechanical engineering technology practice with minimal continual duration of eight weeks. Comprehensive journal, written report, and oral presentation.

Mechanized Agriculture (MCAG)

MCAG 1413 Introduction to Engineering in Agriculture. Prerequisite(s): 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.

MCAG 2313 Surveying. Lab 3. Prerequisite(s): 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.

MCAG 3011 Ag Structures. Lab 2. Prerequisite(s): MATH 1513. Study of types of agricultural structures, building materials, construction tools and methods. Laboratory will provide opportunity to apply and develop associated skills.

MCAG 3211 Engines and Power. Lab 2. Prerequisite(s): MATH 1513. Theory, operation, performance and diagnostics of internal combustion engines for mobile applications.

MCAG 3222 Metals and Welding. Lab 2. Welding safety and the principles and applications of gas, stick and MIG welding, and cutting.

MCAG 3232 Lab Management and Project Construction. Lab 2. Prerequisite(s): 3222. Theory and practice of managing secondary school Ag Mechanics laboratories including safety, organization, design, project construction and evaluation of student projects.

MCAG 4101 Ag Electrification. Lab 2. Prerequisite(s): MATH 1513. A study of electrical theory and electrical applications in agricultural environments.

MCAG 4112 Land Measurement and Site Analysis. Lab 2. Prerequisite(s): MATH 1513 or equivalent. Methods and techniques used to locate sites and evaluate physical conditions. Includes map interpretation and land description, use of Global Positioning Systems, Rectangular System of Land Description and determination of land elevations, areas and slopes. (Same course as ENVR 4112)

MCAG 4123* Principles of Food Engineering. Prerequisite(s): MATH 1513. For non-engineers. Application of the engineering approach to solving problems of food processing and mass transfer problems in food processing. An introduction to the basic concepts of the conservation laws, fluid flow, heat transfer, refrigeration, freezing, psychrometrics, and energy conservation. (Same course as FDSC 4123)

MCAG 4200* Topics in Mechanized Agriculture. 1-4 credits, max 4. Investigations in specialized areas of mechanized agriculture.

MCAG 4203* Irrigation Principles. Prerequisite(s): MATH 1513. Sources, measurement and efficient use of irrigation water. Selection of pumping plants and power units. Layout and management of surface and sprinkler systems.

MCAG 4212 Safety and Health in Agribusiness. Lab 2. Prerequisite(s): 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.

MCAG 4220* Advanced Methods in Agricultural Mechanics. 1-6 credits, max 6. Prerequisite(s): 4222. Developing agricultural mechanics programs for vocational agriculture and technical schools. Application of agricultural mechanics methods, practices and skills to advanced projects.

MCAG 5413* Fundamentals of Conversion. Prerequisite(s): Graduate standing. Principles involved in converting biomass to useful products, including biomass properties, pretreatment, separation, and biochemical and thermochemical conversion. Course available online only through AG*IDEA consortium.

Microbiology (MICR)

MICR 1513 Inquiry-Based Biology. Lab 4. Directed inquiry and hands-on study of biological principles. Restricted to elementary education majors or related fields as model course to learn and teach science.

MICR 2123 Introduction to Microbiology. Prerequisite(s): BIOL 1114. Prerequisite or concurrent enrollment: CHEM 1215 or CHEM 1314. General principles of the biology of microorganisms, including bacteria, viruses, algae, fungi, protozoa and archea.

MICR 2132 Introduction to Microbiology Laboratory. Prerequisite(s): 2123 or concurrent enrollment. Laboratory safety, aseptic technique, microscopy, staining and culture techniques, collection of microbial samples, isolation and identification of microorganisms, microbial growth and basic principles of metabolism, environmental microbiology, other discipline specific laboratory skills.

MICR 3033 Cell and Molecular Biology. Prerequisite(s): 2123 and 2132 or BOT 1404 or ZOOL 1604 and CHEM 1225 or CHEM 1515 or equivalent. The cell and cell morphology, cell macromolecules, organelles, enzymes, energetics, movement of water and materials across membranes, influence of external environment, cellular systems, growth and maintenance, control and integration of function, replication, differentiation, origin, and evolution of cells.

MICR 3103 (N) Microbes: Friends or Foes. Explores the impact of microorganisms on human life, the environment, and world history. This course is designed for non-science majors.

MICR 3143 Medical Mycology. Lab 4. Prerequisite(s): 2123, 2132. Examination of fungi as animal pathogens; laboratory techniques used in the identification of human and animal pathogens, and differentiation from common contaminants.

MICR 3154 Food Microbiology. Lab 4. Prerequisite(s): 2123, 2132 and CHEM 3015 or 3053. Relationship of microorganisms to food manufacture and preservation, to food spoilage and microbial food poisoning and to various aspects of primary food production. (Same course as FDSC 3154)

MICR 3223 Advanced Microbiology. Prerequisite(s): 2123, 2132; Co-requisite(s): CHEM 3015 or CHEM 3053. Subcellular structure and function of microorganisms. Synthesis, translocation, and metabolism of cellular macromolecular constituents. Substrate transport and metabolism.

MICR 3253 Immunology. Prerequisite(s): 2123 and 2132. Vertebrate host's ability to defend itself against foreign invasion. Chemistry and biology of the acquired immune response.

MICR 4000 Honors in Microbiology. 1-4 credits, max 4. Prerequisite(s): Consent of departmental honors committee. Supervised study and research in microbiology.

MICR 4001 Professional Transitions in Microbiology and Cell and Molecular Biology. Prerequisite(s): Declared microbiology major with minimum 70 hours earned and consent of instructor. Understanding major areas and employment activities in microbiology, cell biology and molecular biology fields. Evaluating and understanding scientific and professional literature, and making the transition from undergraduate education to postgraduate education or employment.

MICR 4012 Molecular Microbiology Laboratory I. Lab 4. Prerequisite(s): 3223, 4233. Emphasis on good laboratory practices in microbiology and molecular biology; isolation and enumeration of microorganisms; physiological, biochemical, and molecular characterization of aerobic and anaerobic microorganisms. Must be taken in conjunction with 4112 the following semester. No credit for students with credit in 5012

MICR 4052 Pathogenic Microbiology Lab. Prerequisite(s): MICR 2123 and MICR 2132, co-requisite MICR 3223. Overview of laboratory approaches and techniques for the study, characterization, and identification of bacteria involved in pathogenesis.

MICR 4053 Pathogenic Microbiology. Prerequisite(s): MICR 2123, MICR 2132. Co-requisite(s): MICR 3223. Survey of pathogenic bacteria and the diseases they cause as they relate to humans and animals. Morphology, physiology, and pathogenic mechanisms of a specific bacterial pathogens. May not be used for degree credit with MICR 5053.

MICR 4112 Molecular Microbiology Laboratory II. Lab 4. Prerequisite(s): 4012. Continuation of 4012. Molecular characterization of prokaryotic and eukaryotic microorganisms utilizing nucleic acids, proteins, cell fractionation, cytology, and antigen-antibody reactions. No credit for students with credit in 5112.

MICR 4117 Clinical Microbiology. Lab 12. Prerequisite(s): Concurrent internship in affiliated hospital and all degree requirements for BS in microbiology except 30 hours clinical laboratory science. The theory and laboratory study of pathogenic bacteria, viruses, rickettsiae, fungi, and parasites. Includes isolation, identification, antimicrobial susceptibility testing, and medical significance.

MICR 4123 Virology. Prerequisite(s): 3033 or BIOL 3653; BIOL 3023; Co-requisite(s): 3223. Virus-host interactions, including structure-function of animal, plant and bacterial viruses. Discussion of the molecular biology of virus infection and development. No credit for students with credit in 5123.

MICR 4125 Clinical Chemistry I. Lab 9. Prerequisite(s): Concurrent internship in affiliated hospital and all degree requirements for BS in microbiology except 30 hours clinical laboratory science. The theory and laboratory study of biochemical, clinical microbiology, clinical microscopy, routine and special procedures, and medical significance.

MICR 4133 Molecular and Microbial Genetics. Prerequisite(s): 2123, 2132, BIOL 3023, CHEM 3015 or 3053; Co-requisite(s): 3223. 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. Transfer mechanisms in bacteria and their viruses. Fundamentals of recombinant DNA technology. No credit for students with credit in 5133.

MICR 4203 Bioinformatics. Prerequisite(s): 3033 or BIOIC 3653 or equivalent. Fundamental concepts of biological sequence information and inferential techniques to assign structure, function, and evolutionary relationship among genes and proteins. No prior programming necessary, but familiarity with computers assumed. No credit for students with credit in 5203.


MICR 4233 Advanced Cell and Molecular Biology. Prerequisite(s): 3033. Advanced topics in cell and molecular biology including regulatory mechanisms of gene expression, protein function, cell structure and organization, cell division and development. No credit for students with credit in 5233.

MICR 4236 Clinical Hematology. Lab 12. Prerequisite(s): Concurrent internship in affiliated hospital and all degree requirements for BS in microbiology except for 30 hours of clinical laboratory science. Systematized study of diseases, cell maturation and function, principles of hemostasis; methodology used in special and special hematology studies; and correlation of hematological findings with physiological conditions.

MICR 4246 Clinical Immunology. Lab 12. Prerequisite(s): Concurrent internship in affiliated hospital and all degree requirements for BS in microbiology except for 30 hours clinical laboratory science. Immunologic responses and products 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.

MICR 4253 Concepts in Medical Genetics. Prerequisite(s): BIOL 3023. Application of genetic principles in the study of human diseases, including the inheritance, molecular mechanisms, detection, characterization, and discovery of human genes. No credit for students with credit in 5233.

MICR 4263 Eukaryotic Genetics. Lab 4. Prerequisite(s): 3033. Integration of genetics and genomics principles, the basic processes of gene transmission, molecular biology of gene expression and evolutionary genetics by gaining social and historical context in which genetics are developed. Focus on the dramatic change in our understanding of human genetics and the role such information has in our view of disability and disease. No credit for students with credit in 5263.

MICR 4323 Biological Energy Transduction. Prerequisite(s): MICR 3033 or BIOIC 3653. An exploration of the principals and mechanisms of energy transduction in plants, animals, and microbial systems. The course emphasizes electron transport and ATP production in both chemotrophic and phototrophic organisms and correlation of the cellular and molecular bases for these processes. May not be used for degree credit with MICR 5523.

MICR 4325 Clinical Chemistry II. Lab 9. Prerequisite(s): Concurrent internship in affiliated hospital and all degree requirements for BS in microbiology except for 30 hours clinical laboratory science. The theory and laboratory methodology of analytical biochemistry instrumentation, lab mathematics, routine and special procedures and medical significance.

MICR 4351 Topics in Clinical Laboratory Science. Prerequisite(s): Concurrent internship in affiliated hospital and all degree requirements for BS in microbiology except for 30 hours clinical laboratory science. Principles and practices of the medical laboratory including basic management, quality assurance, education methodology, computer applications, laboratory safety, and special projects in selected areas.

MICR 4423 Bacterial Cell Walls: Form and Function. Prerequisite(s): 2123, 2132, and 3223. Topics will include structure and synthesis of membrane and cell wall components (including lipids, peptidoglycan and membrane proteins). Mechanisms of transport across the cell wall, roles components of the cell wall play in the survival of the cell (and in the case of pathogens, the ability to cause disease), and antimicrobial agents that affect the cell wall and the mechanisms used to eliminate these agents from the cell. No credit for students with credit in 5423.

MICR 4524* Biological Laboratory Instrumentation. Prerequisite(s): CHEM 1515 and BOT 1404 or MICR 2123 or ZOOL 1604 or equivalents or consent of instructor. Lecture and laboratory course in biological instrument use, theory, experimental design, maintenance, and troubleshooting. Topics include liquid handling systems, pH/ISE meters, electrophoresis, spectrophotometers, centrifuges, chromatography, thermocyclers, and DNA sequencers. No credit for students with credit in MICR 5524. (Same course as BIOL 4524)

MICR 4531 Chemical Biology. Prerequisite(s): CHEM 3053, 3112, 3153. Chemistry explains many properties of biological macromolecules and also provides research tools to study these molecules. This course will examine how both of these aspects help explain the molecular processes at the basis of life, and will cover (1) basic knowledge of chemistry needed to understand life, (2) chemical reactions as they occur in the cell, (3) chemical methods that are valuable to research in the life sciences.

MICR 4543 Microbial Genomics and Bioinformatics. Prerequisite(s): MICR 2123; MICR 3033 or MICR 3223 or equivalents. Basic approaches and strategies for microbial genome analysis, and hands-on training on the subject. May not be taken for degree credit with MICR 5543.

MICR 4990 Special Problems. 1-3 credits, max 12. Prerequisite(s): Consent of instructor. Investigations in the field of microbiology.

MICR 4993 Senior Honors Project. Prerequisite(s): 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 special faculty member as well. Required for graduation with honors in microbiology.

MICR 5000* Thesis. 2-6 credits, max 6. Prerequisite(s): Consent of major professor. A student studying for the MS degree enrolls in this course for six hours credit.

MICR 5002* Professionalism for the Microbiologist. Prerequisite(s): MICR 4214. Microbiology graduate student or permission of instructor. Introduces the microbiology graduate student to the standards of the microbiology professional and to basic skills in communication and data retrieval needed by all microbiologists. It is required of all and limited to MS and PhD students in Microbiology & Molecular Genetics.

MICR 5012* Molecular Microbiology Laboratory I. Lab 4. Prerequisite(s): 3223, 4233. Emphasis on good laboratory practices in microbiology and molecular biology; isolation and enumeration of microorganisms; physiological, biochemical, and molecular characterization of aerobic and anaerobic microorganisms. Must be taken in conjunction with 5112 the following semester. No credit for students with credit in 4012.

MICR 5052* Techniques in Molecular Biology. Lab 2. Prerequisite(s): Graduate student and permission of instructor. Provides the basic skills for scientific thinking and analysis in molecular microbiological research.

MICR 5053* Pathogenic Microbiology. Prerequisite(s): MICR 2123 and MICR 3223. Co-requisite(s): MICR 2223. Survey of pathogenic bacteria and the diseases they cause as they relate to humans and animals. Morphology, physiology, and pathogenic mechanisms of specific bacterial pathogens. May not be used for degree credit with MICR 4053.

MICR 5112* Molecular Microbiology Laboratory II. Lab 4. Prerequisite(s): 5012. Continuation of 5012. Molecular characterization of prokaryotic and eukaryotic microorganisms utilizing nucleic acids, proteins, cell fractionation, cytology, and antigen-antibody reactions. No credit for students with credit in 4112.

MICR 5113* Advanced Immunology. Prerequisite(s): 3253. Advanced studies with emphasis on the regulation of vertebrate immune responses.

MICR 5123* Virology. Prerequisite(s): 3033 or BIOIC 3653, BIOL 3023. Co-requisite(s): 3223. Virus-host interactions including structure-function of animal, plant, and bacterial viruses. Discussion of the molecular biology of virus infection and development. No credit for students with credit in 4123.

MICR 5133* Molecular and Microbial Genetics. Prerequisite(s): BIOL 3023, DICM 3232 or CHEM 3053, MICR 2123 and 2132. Co-requisite(s): 3223. 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. No credit for students with credit in 4133.

MICR 5142* Techniques in Molecular Biology. Lab 4. Prerequisite(s): Consent of instructor. Comprehensive laboratory course in research techniques involving classical genetics and molecular biology.

MICR 5153* Emerging Infectious Agents. Prerequisite(s): 4123 or 4134 or consent of instructor. An in-depth discussion of the importance of emerging infectious agents, the molecular basis for their emergence, and the broad spectrum of host-microbe interactions favoring the evolution of new infectious agents.

MICR 5160* Seminar. 1 credit, max 2. Prerequisite(s): consent of instructor. Required of and limited to all MS and PhD students majoring in microbiology, cell and molecular biology.

MICR 5203* Bioinformatics. Prerequisite(s): 3033 or BIOIC 3653 or equivalent. Fundamental concepts of biological sequence information and inferential techniques to assign structure, function, and evolutionary relationship among genes and proteins. No prior programming necessary, but familiarity with computer desktop assumed. No credit for students with credit in 4203.

MICR 5214* Microbial Ecology. Lab 4. Prerequisite(s): 2123 and 2132 and CHEM 3015 or 3053; Co-requisite(s): 3223. Fundamentals of microbial physiology and genetics of microbial populations under various redox conditions. Species and functional guilds in natural habitat. Community structure and diversity of niches. Population interactions, competition and ecosystem stability. Metabolic activities in natural and managed systems. Microbial capacities and elemental cycling. Genes and genetic exchange in the environment. Modern nucleic acid tools in microbial identification and evolutionary phylogeny. No credit for students with credit in 4214.
MICR 5233* Advanced Cell and Molecular Biology. Prerequisite(s): 3033. Advanced topics in cell and molecular biology including regulatory mechanisms of gene expression, protein function, cell structure and organization, cell division, and development. No credit for students with credit in 4233.

MICR 5253* Concepts in Medical Genetics. Prerequisite(s): BIOL 3023. Application of genetic principles in the study of human diseases, including the inheritance, molecular mechanisms, detection and evaluation, and discovery of human genes. No credit for students with credit in 4253.

MICR 5263* Eukaryotic Genetics. Prerequisite(s): 3033. Integration of genetics and genomics principles, the basic processes of gene transmission, molecular biology of gene expression and evolution, and genomics by gaining social and historical context in which genetics are developed. Participants are expected to comprehend the dramatic change in our understanding of human genetics and the role such information has in our view of disability and disease. No credit for students with credit in 4263.

MICR 5273* Advanced Principles of Microbial Pathogenesis. Advanced study of the pathogenic mechanisms used by microbial pathogens to cause disease. Principles of pathogen and pathogen-host interactions that lead to disease pathology.

MICR 5323* Biological Energy Transduction. Prerequisite(s): MICR 3033 or BIOL 3853. An exploration of the principals and mechanisms of energy transduction in plants, animals, and microbial systems. The course emphasizes electron transport and ATP production in both chemotrophic and phototrophic organisms and considers the cellular and molecular bases for these processes. May not be used for degree credit with MICR 4323.

MICR 5333* Controversies in Vaccinology. Prerequisite(s): OSU graduate student status or consent of instructor. Public misconceptions about science abound, however, these misconceptions have a major impact on perception of research and public policy. Examples of themes in science as portrayed, for example, in film will be explored and critically discussed. Ways to improve communication between the scientist and the general public will be evaluated.

MICR 5423* Bacterial Cell Walls: Form and Function. Prerequisite(s): 2123, 2132, and 3223. Topics will include structure and synthesis of membrane and cell wall components (including lipids, peptidoglycan and membrane proteins), mechanisms of transport across the cell wall and the roles components of the cell wall play in the survival of the cell (and in the case of pathogens, the ability to cause disease). In addition, antimicrobial agents that affect the cell wall and the mechanisms used to eliminate these agents from the cell will also be discussed. No credit for students with credit in 4423.

MICR 5513* Grant Proposal Preparation. Prerequisite(s): Admission into Microbiology graduate program. Focused on research grant proposal writing. Activities include hypothesis development and critical evaluation of research proposals.

MICR 5524* Biological Laboratory Instrumentation. Lab 4. Prerequisite(s): CHEM 1515 and BOT 1404 or MICR 2123 or ZOOL 1604 or equivalents or consent of instructor. Lectures and laboratory course in biological instrumentation use, theory, experimental design, maintenance, and troubleshooting. Topics include liquid handling systems, pHI/ISE meters, electrophoresis, spectrophotometers, centrifuges, chromatography, thermocyclers, and NGS sequencers. No credit for students with credit in MICR 4524. (Same course as BIOL 5524).

MICR 5543* Microbial Genomics and Bioinformatics. Prerequisite(s): MICR 2123; MICR 3033 or MICR 3223 or equivalents. Basic approaches and strategies for microbial genome analysis, and hands-on training on the subject. Graduate students enrolled in the class are expected to give a comprehensive presentation on the genomic analysis done throughout the semester. The presentation should be a manuscript format with a brief Introduction, Materials and Methods, Results, and Discussion. A comprehensive use of all principals covered in the class is expected and will be used for evaluation. Credit will also be given to handling questions and presentation skills. May not be used for degree credit with MICR 4543.

MICR 5590* Special Problems. 1-4 credits, max 10. Prerequisite(s): Permission of instructor. Investigations in the field of microbiology.

MICR 6000* Dissertation. 1-15 credits, max 45. Prerequisite(s): Consent of major advisor. Registration for the fourth year of dissertation work.

MICR 6112* Molecular Biology of Viral Diseases. Prerequisite(s): 4123 and 4133. Advanced study of bacteriophages.

MICR 6120* Recent Advances in Microbiology. 1 credit, max 6. Prerequisite(s): One graduate course in biochemistry. Discussion and evaluation of recent scientific contributions in terms of the living organism.

MICR 6133* Cellular Microbiology. Prerequisite(s): A strong undergraduate level background in general microbiology, biochemistry or cell biology is expected. The molecular interactions between intracellular parasites and their host cells will be explored, emphasizing the manipulation of normal cellular processes to the benefit of the parasite. The course will involve critical reading of the current literature and development of an understanding of molecular and cell biology research techniques.

MICR 6143* Advanced Microbial Physiology. Prerequisite(s): MICR 3223 or consent of instructor. Discussion of selected topics in microbial physiology. Critical analysis of research papers.


MICR 6163* Quantum Microbiology. Prerequisite(s): OSU graduate student or permission of instructor. This class will provide an in-depth introduction into fundamental principles therewithin, detection and characterization, and discovery of human genes. No credit for students with credit in 4263.

MICR 6223* Molecular Environmental Microbiology and Ecology. Prerequisite(s): MICR 3223 or consent of instructor. This course focuses on fundamental and applied aspects of microbial ecology, physiology and genomics. The course aims to highlight the value of microbes in applied disciplines such as medicine, agriculture, and biotechnology. Recent advances in methodologies and approaches for examining the phylogenetic and metabolic diversity of microorganisms in various ecosystems, as well as tools for understanding microbial community composition and identification of rare members of microbial community will be highlighted.

MICR 6253* Microbial Evolution. Prerequisite(s): 2123, 2132, BIOL 3653, BIOL 3023. 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 protobiont and a probable fate of early microbes.

MICR 6323* Current Topics in Cellular Signaling and Gene Regulation. Prerequisite(s): A strong undergraduate level background in microbiology, biochemistry or cell biology is expected. Discussion of current literature on the mechanisms of prokaryotic and eukaryotic signal transduction and gene regulation.

Military Science (MLSC)

MLSC 1000 Leadership Laboratory. 1 credit, max 2. Lab 2. Prerequisite(s): Concurrent enrollment in 1112 and 1212. Learning and practicing basic skills such as rappelling, drill and ceremony, land navigation, individual first aid, individual training in small unit tactics.

MLSC 1112 Foundations of Officership. Team study and activities in basic drill, physical fitness, rappelling, leadership reaction course, first aid, presentations and basic marksmanship. Fundamentals of leadership. No military obligation incurred. Completion of MLSC 2122 qualifies a student for entry into the Advanced Course.

MLSC 2130 Military Physical Conditioning. 1 credit, max 2. Lab 3. Prerequisite(s): Must be enrolled in MLSC theory classes. Participation in learning to plan and lead a physical fitness program. Development of an individual fitness program and the role of exercise and fitness in person’s life.

MLSC 2233 Individual Leadership Studies. Lab 2. Ethics-based leadership skills that develop individual abilities and contribute to the building of effective teams. Skills in oral presentation, writing, planning, coordinating groups, land navigation and basic military tactics.


MLSC 3113 Leadership and Problem Solving. Lab 2. Prerequisite(s): Completion of lower-division MLSC or equivalent, and approval of professor of military science. Practical opportunities to lead small groups in situations of increasing complexity receiving personal assessments and encouragement. Use of small unit defensive tactics and opportunities to plan and conduct training for lower-division students both to develop such skills and as vehicles for practicing leadership.

MLSC 3223 Leadership and Ethics. Lab 2. Prerequisite(s): 3113. Analysis of tasks; preparation of written or oral guidance for team members to accomplish tasks. Delegating tasks and supervising. Planning and adapting to the unexpected in organizations under stress. Examination and application of lessons from leadership case studies. Examination of importance of ethical decision-making in setting a positive climate that enhances team performance.

MLSC 4014 Leader Development and Assessment Course. Lab 8. Prerequisite(s): five-week camp conducted at Army Basic Training. Individual leadership and basic skills performance.

MLSC 4123 Leadership and Management. Lab 2. Prerequisite(s): 3113 and 3223. Planning conducting and evaluating activities of the ROTC cadet organization. Articulating goals, putting plans into action to attain them.
Lab 2. Prerequisite(s): 3113 and 3223. Continuation

Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better; and pass proficiency review. Theory and practice of basic audio and video production techniques leading to later applications in radio, television and multimedia production.

MMJ 3203 News Writing. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or higher in both; and pass proficiency review. The basics of news writing, grammar and Associated Press will be stressed. Students will learn the basics of "writing news" and how to write basic stories including fire, crime, accidents, obituaries, etc.

MMJ 3263 Multimedia Reporting. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. Introduces the basic sources, documents and reporting techniques needed to cover typical general news beats. Real-world assignments provide practical experience reporting and writing on deadline across media platforms such as print, broadcast and web. News judgment as well as interviewing, time-management and writing skills will be addressed. Gathering news in an ethical manner and telling substantive, multi-media stories that encompass the community’s diversity are emphasized.

MMJ 3293 Information Graphics. Lab 2. Prerequisite(s): 3263 and 4423 with "C" or better and 4393 with "C" or better or concurrent, and pass proficiency review. Using computer-designed charts, maps, graphs, diagrams and other visual representations of information to tell the news. Combines theories of non-verbal communication and practical application. Includes the basic design concepts and techniques for creating TV and video graphics.

MMJ 3313 Editing in a Multimedia Environment. Lab 2. Prerequisite(s): 3263 with a grade of "C" or better or concurrent enrollment; and a pass proficiency review. Principles and techniques of editing copy for print, broadcast and web; selecting pictures and video, and writing headlines, cutlines, blurs, teases and promos. Strong emphasis placed on language usage and ethical decision-making.

MMJ 3553 Advanced Reporting. Lab 2. Prerequisite(s): 3263 with "C" or better, MMJ 3153 or concurrent enrollment, and pass proficiency review. News writing and reporting techniques combined with newsgathering technology to enable students to produce stories that can be featured across all media platforms.

MMJ 3623 Internet Communication. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with grade of "C" or better in each; and pass proficiency review. Introduction to the Internet focusing on web design, technology and content. Focuses on the process of creating web-based content and engaging users online. Theoretical and practical understanding of how the Internet is changing the mass media and media-related organizations communicate with audiences.

MMJ 3773 Voice Production and Performance. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. Covers the physical aspects of voice production and how to train and maintain the voice for effective communication. Students will improve their interviewing skills and become more effective communicators, with emphasis on conducting live interviews, ad-libbing and working with a teleprompter.

MMJ 3823 Photography I. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with grade of "C" or better, MMJ 3153 or concurrent enrollment, and pass proficiency review. Expression of visual communications through photography. Creating and producing photographs using digital equipment and understanding lenses, exposures, color and composition. Manipulation, color and tone correction of photography using photo-editing software. Students who want to complete digital photography or to prepare for advanced work in photography or photojournalism.

MMJ 3873 Audio Production. Lab 2. Prerequisite(s): 3153 with a grade of "C" or better; and pass proficiency review. Prepares students to work in radio and internet audio production and imaging. Students prepare and present materials in a broadcast studio environment.

MMJ 3900 Multimedia Journalism Internship. 1-3 credits, max 6. Prerequisite(s): 3153 and 3263 with a grade of "C" or better and consent of instructor; and pass proficiency review. Internship practice for qualified multimedia journalism students who wish creative communications experience beyond that available in the classroom.

MMJ 3913 Field Production. Lab 2. Prerequisite(s): 3153 with a grade of "C" or better; and pass proficiency review. Video production techniques, including camera, audio, lighting, staging, producing, post production, graphics and on-camera performance. Project-driven and emulates actual client-based productions. Emphasizes constant planning and evaluation of productions.

MMJ 3943 Photojournalism. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with grade of "C" or better in each, and pass proficiency review. Theory and practice in the digital techniques of photojournalism. Intermediate concepts of lighting, composition, action and storytelling via digital photography. A basic understanding of photography and photo developing necessary. Must have access to 35mm single reflex or digital camera.

MMJ 4243 Programs and Audience. Prerequisite(s): MC 2003 with a grade of "C" or better; and pass proficiency review. Audience analysis, proper construction of programs for greater 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.

MMJ 4313 Public Affairs Reporting. Lab 2. Prerequisite(s): MMJ 3263 with a grade of "C" or better; and pass proficiency review. Reviewing techniques empowering journalists to fulfill their watchdog role in a democracy. Practical experience in accurately reporting and writing on deadline. Focus on multimedia journalism and techniques to tell the story in new ways, emphasizing importance of human diversity and cultivating sources ethically. Stress the use of government documents.

MMJ 4393 Computer Assisted Journalism. Prerequisite(s): MMJ 3263 with a grade of "C" or better; and pass proficiency review. STAT 203 or STAT 202 or STAT 2053. Provided especially for students who want to major in journalism or broadcast journalism. Students will be able to understand the role of statistics in the field of journalism and apply statistical methods to real-world journalism problems. The ability to use statistical software and interpret statistical results is required.

MMJ 4413 Advanced Reporting and Writing. Prerequisite(s): MMJ 4313 with a grade of "C" or better, and pass proficiency review. Enhancement of writing skills and reporting techniques: evaluation of sources and polling techniques, and investigative coverage of newsmakers and events.

MMJ 4423 Graphic Design in Multimedia. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with "C" or better; and pass proficiency review. Design principles, techniques and practices for a converging media. Includes photo editing and introduction to type for print and online. Emphasizes ethical decision-making in content selection and placement.

MMJ 4433 Feature Writing for Newspaper and Magazine. Prerequisite(s): MC 2003 and MC 2023 with "C" or better; and pass proficiency review. Application of writing skills for feature writing and reporting techniques: evaluation of sources and polling techniques, and investigative coverage of newsmakers and events.

MMJ 4440 Specialized Multimedia Journalism Applications. 3 credits, max 6. Prerequisite(s): MMJ 3153 or MMJ 3263 with a grade of "C" or better and consent of department; and pass proficiency review. Professional journalism at an advanced level. Special topics in areas such as announcing, performance, business, political, business and investigative reporting; advanced layout and design or audio production; feature, column and editorial writing. Course content varies by semester. Meets with MC 5640. No credit for students in MC 5540.

MMJ 4553 News Production. Lab 2. Prerequisite(s): MMJ 3153 and MMJ 3553 each with a grade of "C" or higher; and pass proficiency review. Advanced skills in reporting, news producing, editing and anchoring. Students will assemble a video newscast or newsletter with content that is usable across various media platforms.

MMJ 4573 Broadcast Documentary. Prerequisite(s): MMJ 3553 and MMJ 3913 with a grade of "C" or better; and pass proficiency review. Student-written and produced broadcast and cablecast mini-documentaries; analysis of selected programs.

MMJ 4753 Media and Elections. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. Examination of media's role in the political process with primary emphasis on print and data analysis while focusing on social science research methods. Combines the scientific method with the process approach to news writing. Teaches how to find and import data into a spreadsheet and systematically analyze it using basic and advanced techniques. The data analysis will generate an idea for a story for print or broadcast, which must be followed up with reporting and writing that stresses how people are affected.

MMJ 4773 Censorship. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. A critical examination of the history of censorship in the United States and the role of censorship in the development of the First Amendment. The course will explore the definition of censorship, the common elements found in all forms of censorship, the rationalizations and justifications for censorship, and the consequences and unintended results of censorship. No credit for students with credit in MC 5773.

MMJ 4863 Media Management. Prerequisite(s): MMJ 3263 with a grade of "C" or better; and pass proficiency review. Basic issues, concepts, operational procedures and strategies associated with effectively managing media corporations. Examines management of media enterprises who want to gain information about concepts related to media convergence. Emphasis is placed on making ethical decisions and administrative choices in staffing and content that reflect a community’s diversity. No credit for students with credit in MC 5863.

MMJ 4953 Advanced Production Practices. Lab 2. Prerequisite(s): MMJ 3913 and MMJ 3263 with "C" or better, and pass proficiency review. Advanced professional television production. Students produced and directed television programs, including "specials," for distribution on cable or other professional platforms.
MMJ 4960 Live Field Production. 3 credits, max 6. Prerequisite(s): MMJ 3153 with a grade of "C" or better; and pass proficiency review or consent of instructor. Develop a live, in-the-field production from writing a program proposal to an actual live broadcast. Students determine what equipment is needed; conduct a site survey to develop a location plot for the site; determine the best location for the cameras and master control area; write a facilities request; and create scripts for the pre-parade show and the Homecoming parade broadcast. Students also learn proper techniques of in-the-field videography, switching (live editing), and audio.

MMJ 4970 O-State Report. Prerequisite(s): MMJ 3553 or SPM 3863 with a grade of "C" or better; Instructor permission. Students will have the opportunity to anchor, report and produce for OStateReport, the campus newsmagazine that airs on OStateTV. The class will focus on development of executable news story ideas, writing and producing video news content, production of a news magazine, reporting and anchoring performance and development of a demo reel to be used to obtain professional employment.

MMJ 4973 Multimedia Journalism Capstone. Prerequisite(s): MMJ 3553; MMJ 4953 with a grade of "C" or better in each; and pass proficiency review. Separate, concurrent lectures teach advanced principles and techniques to students specializing in reporting or digital production. Students come together as teams to create multimedia news products.

Music (MUSI)

MUSI 0500 Student Recital Attendance. Graduation requirement for music degree or certificate candidates. Graded on a pass/fail basis.


MUSI 1011 Piano Class Lessons. Prerequisite(s): Music major status or consent of instructor. For students with no previous experience.

MUSI 1021 Piano Class Lessons. Prerequisite(s): Music major status or consent of instructor.

MUSI 1031 Voice Class Lessons.

MUSI 1071 Single Reed Techniques. Lab 2. Methods for playing and teaching the clarinet and saxophone.

MUSI 1081 Double Reed Techniques. Lab 2. Methods for playing and teaching the oboe and bassoon.


MUSI 1110 Elective Organ. 1-2 credits, max 8.

MUSI 1120 Elective Piano. 1-2 credits, max 8.

MUSI 1130 Elective Voice. 1-2 credits, max 8. Prerequisite(s): Concurrent enrollment in a choral ensemble (MUSI 2630, MUSI 3630 and/or MUSI 4600) or permission of instructor.

MUSI 1140 Elective Brass. 1-2 credits, max 8.

MUSI 1150 Elective Strings. 1-2 credits, max 8.

MUSI 1160 Elective Woodwinds. 1-2 credits, max 8.

MUSI 1170 Elective Percussion. 1-2 credits, max 8.

MUSI 1180 Secondary Organ. 1-2 credits, max 8.

MUSI 1190 Secondary Piano. 1-2 credits, max 8.

MUSI 1200 Secondary Voice. 1-2 credits, max 8.

MUSI 1210 Secondary Brass. 1-2 credits, max 8.

MUSI 1220 Secondary String. 1-2 credits, max 8.

MUSI 1230 Secondary Woodwind. 1-2 credits, max 8.

MUSI 1240 Secondary Percussion. 1-2 credits, max 8.

MUSI 1250 Major Organ. 1-4 credits, max 8.

MUSI 1260 Major Piano. 1-4 credits, max 8.

MUSI 1270 Major Voice. 1-4 credits, max 8.

MUSI 1280 Major Violin. 1-4 credits, max 8.

MUSI 1290 Major Viola. 1-4 credits, max 8.

MUSI 1300 Major Cello. 1-4 credits, max 8.

MUSI 1310 Major Double Bass. 1-4 credits, max 8.

MUSI 1340 Major Flute. 1-4 credits, max 8.

MUSI 1350 Major Oboe. 1-4 credits, max 8.

MUSI 1360 Major Clarinet. 1-4 credits, max 8.

MUSI 1370 Major Saxophone. 1-4 credits, max 8.

MUSI 1380 Major Bassoon. 1-4 credits, max 8.

MUSI 1390 Major Trumpet. 1-4 credits, max 8.

MUSI 1400 Major French Horn. 1-4 credits, max 8.

MUSI 1410 Major Trombone. 1-4 credits, max 8.

MUSI 1420 Major Euphonium. 1-4 credits, max 8.

MUSI 1430 Major Tuba. 1-4 credits, max 8.

MUSI 1440 Major Percussion. 1-4 credits, max 8.

MUSI 1531 Sight Singing and Aural Skills I. Development of skills in sight singing and aural perception. Taken concurrently with MUSI 1533.

MUSI 1533 Theory of Music I. The study of tonal harmony through analysis, composition, and keyboard applications. Taken concurrently with MUSI 1531.

MUSI 1541 Sight Singing and Aural Skills II. Prerequisite(s): 1531 and 1533. A continuation of 1531. Taken concurrently with 1543.

MUSI 1543 Theory of Music II. Prerequisite(s): MUSI 1533. A continuation of MUSI 1531. Taken concurrently with MUSI 1541.

MUSI 1623 Introduction to Music Business. Prerequisite(s): Music major status or consent of instructor. A survey of music business procedures, opportunities, technologies and trends.

MUSI 1631 Introduction to Diction for Singers. Designed for Music Education majors. Introduces and develops skills in pronunciation and diction for singing in English, Italian, French and German.

MUSI 2010 Piano Class Lessons. Prerequisite(s): 1021 and music major status. Class lessons for music majors (non-keyboard concentration) preparing for the piano proficiency examination.

MUSI 2051 High String Techniques. Methods for playing and teaching the violin and viola.

MUSI 2061 Low String Techniques. Methods for playing and teaching the cello and double bass.

MUSI 2071 Flute Techniques. Methods for playing and teaching the flute.

MUSI 2091 Low Brass Techniques. Methods for playing and teaching the trombone, euphonium, and tuba.

MUSI 2250 Major Organ. 1-4 credits, max 8. Prerequisite(s): 1250.

MUSI 2260 Major Piano. 1-4 credits, max 8. Prerequisite(s): 1260.

MUSI 2270 Major Voice. 1-4 credits, max 8. Prerequisite(s): 1270.

MUSI 2280 Major Violin. 1-4 credits, max 8. Prerequisite(s): 1280.

MUSI 2290 Major Viola. 1-4 credits, max 8. Prerequisite(s): 1290.

MUSI 2300 Major Cello. 1-4 credits, max 8. Prerequisite(s): 1300.

MUSI 2310 Major Double Bass. 1-4 credits, max 8. Prerequisite(s): 1310.

MUSI 2340 Major Flute. 1-4 credits, max 8. Prerequisite(s): 1340.

MUSI 2350 Major Oboe. 1-4 credits, max 8. Prerequisite(s): 1350.

MUSI 2360 Major Clarinet. 1-4 credits, max 8. Prerequisite(s): 1360.

MUSI 2370 Major Saxophone. 1-4 credits, max 8. Prerequisite(s): 1370.

MUSI 2380 Major Bassoon. 1-4 credits, max 8. Prerequisite(s): 1380.

MUSI 2390 Major Trumpet. 1-4 credits, max 8. Prerequisite(s): 1390.

MUSI 2400 Major French Horn. 1-4 credits, max 8. Prerequisite(s): 1400.

MUSI 2410 Major Trombone. 1-4 credits, max 8. Prerequisite(s): 1410.

MUSI 2420 Major Euphonium. 1-4 credits, max 8. Prerequisite(s): 1420.

MUSI 2430 Major Tuba. 1-4 credits, max 8. Prerequisite(s): 1430.

MUSI 2440 Major Percussion. 1-4 credits, max 8. Prerequisite(s): 1440.

MUSI 2450 Major Harpsichord. 1-4 credits, max 8.

MUSI 2511 Sight Singing and Aural Skills I. Prerequisite(s): 1541 and 1543. Further development of skills in sight singing and aural perception. Taken concurrently with 2553.

MUSI 2513 Theory of Music III. Prerequisite(s): MUSI 1543. Taken concurrently with MUSI 2551.

MUSI 2521 Sight Singing and Aural Skills IV. Prerequisite(s): 2551 and 2553. A continuation of 2551. Taken concurrently with MUSI 2553.

MUSI 2523 Theory of Music IV. Prerequisite(s): MUSI 2553. A continuation of MUSI 2551. Taken concurrently with MUSI 2561.

MUSI 2573 (H) Introduction to Music. Instruments, musical forms and styles, and major composers from the Middle Ages to the present. For non-majors; no prior musical experience required.

MUSI 2610 University Bands I. 1 credit, max 6, Lab 3-5.

MUSI 2620 Symphony Orchestra I. 1 credit, max 6, Lab 4. (Same course as MUSI 2620 & 5620)*

MUSI 2630 University Choral Ensembles I. 1 credits, max 6, Lab 3-5. (Same course as MUSI 2630 & 5630)*

MUSI 2722 Introduction to Music Education. Prerequisite(s): 1533, 1543. An entry level course designed to socialize the music education major to the role of the music education teacher within U.S. schools. Topics include motivation and management, learning theories, micro teaching, music advocacy, portfolio introduction, and early field experience.
MUSI 2733 (H) History of Rock and Roll. Study of the origins and innovators of rock and roll music. Course will examine the musical, historical and sociological significance of variety of genres.

MUSI 2773 (H) History of Jazz. Elements and stylistic features of jazz, its evolution and its impact on society.

MUSI 2783 (H) American Popular Music. A survey of American popular music from the nineteenth century to the present day. Beginning with Tin Pan Alley and Broadway, the course traces many major developments in American popular music, such as rock and roll, country music, soul, funk, disco, punk rock, and hip-hop.

MUSI 2832 Elementary Music Methods. Prerequisite(s): 2722. An overview of effective methods, techniques and materials for teaching music to children in the elementary grades. Theories of child development and implications on music learning; current philosophies or approaches for teaching music (Kodaly, Orff, and Dalcroze); designing and teaching musical activities through which children learn musical concepts and develop musical skills.

MUSI 2842 Intermediate Music Methods. Prerequisite(s): 2832. Second in a series of two vocal method courses for vocal music education majors. Field experience and peer teaching activities. Curriculum design and evaluation; technology for music instruction; multicultural music in the classroom; music for exceptional children; and music in an integrated curriculum.

MUSI 3022 Piano Skills for Vocal Music Education Majors. Prerequisite(s): 3210 or consent of instructor. Development of skills in sight-reading, score reading, and general ensemble accomplishment for vocal music education majors.

MUSI 3110 Elective Organ. 1-2 credits, max 8. Prerequisite(s): 1110.

MUSI 3120 Elective Piano. 1-2 credits, max 8. Prerequisite(s): 1120.

MUSI 3130 Elective Voice. 1-2 credits, max 8. Prerequisite(s): Concurrent enrollment in a choral ensemble (MUSI 2630, MUSI 3630 and/or MUSI 4600) or permission of instructor.

MUSI 3140 Elective Brass. 1-2 credits, max 8. Prerequisite(s): 1140.

MUSI 3150 Elective String. 1-2 credits, max 8. Prerequisite(s): 1150.

MUSI 3160 Elective Woodwind. 1-2 credits, max 8. Prerequisite(s): 1160.

MUSI 3170 Elective Percussion. 1-2 credits, max 8. Prerequisite(s): 1170.

MUSI 3180 Secondary Organ. 1-2 credits, max 8. Prerequisite(s): 1180.

MUSI 3190 Secondary Piano. 1-2 credits, max 8. Prerequisite(s): 1190.

MUSI 3200 Secondary Voice. 1-2 credits, max 8. Prerequisite(s): 1200.

MUSI 3210 Secondary Brass. 1-2 credits, max 8. Prerequisite(s): 1210.

MUSI 3220 Secondary String. 1-2 credits, max 8. Prerequisite(s): 1220.

MUSI 3230 Secondary Woodwind. 1-2 credits, max 8. Prerequisite(s): 1230.

MUSI 3240 Secondary Percussion. 1-2 credits, max 8. Prerequisite(s): 1240.

MUSI 3250 Major Organ. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2250.

MUSI 3260 Major Piano. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2260.

MUSI 3270 Major Voice. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2270.

MUSI 3280 Major Violin. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2280.

MUSI 3290 Major Viola. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2290.

MUSI 3300 Major Cello. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2300.

MUSI 3310 Major Double Bass. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2310.

MUSI 3340 Major Flute. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2340.

MUSI 3350 Major Oboe. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2350.

MUSI 3360 Major Clarinet. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2360.

MUSI 3370 Major Saxophone. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2370.

MUSI 3380 Major Bassoon. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2380.

MUSI 3390 Major Trumpet. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2390.

MUSI 3400 Major French Horn. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2400.

MUSI 3410 Major Trombone. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2410.

MUSI 3420 Major Euphonium. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2420.

MUSI 3430 Major Tuba. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2430.

MUSI 3440 Major Percussion. 1-4 credits, max 8. Prerequisite(s): Upper-division examination, 2440.

MUSI 3460 Secondary Harpsichord. 1-2 credits, max 8.

MUSI 3543 (H, I) Music and Culture of Northern Italy. Study of northern Italy’s contributions to culture through music and composers, instrument makers, architecture, and visual arts.

MUSI 3573 (D, H) America’s Ethnic Music. A survey of the ethnic settlers of America and their musical traditions and literatures. Particular emphasis is given to settlers indigenous to Oklahoma. Students will examine their individual ethnic roots in music, family traditions, and life passages (births, deaths, celebrations).

MUSI 3582 Survey of World Musics. Prerequisite(s): MUSI 1543 or consent of instructor. Survey of musical systems, performance practices, and philosophies from around the world.

MUSI 3583 (H, I) Traditional World Music. Survey of the richly diverse musics of the world, emphasizing traditional musical practices. Exploration of the wide parameters of musical possibilities and the distinct priorities of various musical cultures, in order to gain insight and appreciation.

MUSI 3592 Introduction to Music Technology. Prerequisite(s): 1543.

MUSI 3610 University Bands II. 1 credit, max 8. Lab 3-5. Prerequisite(s): 4 hours of 2610. (Same course as 2610 & 5610)

MUSI 3620 Symphony Orchestra II. 1 credit, max 8. Lab 4. (Same course as 2620 & 5620)

MUSI 3630 University Choral Ensembles II. 1 credit, max 8. Lab 3-5. Prerequisite(s): 4 hours of 2630. (Same course as 2630 & 5630)

MUSI 3640 Rehearsal Practicum. 1 credit, max 3. Lab 1-3. Prerequisite(s): MUSI 3722, concurrent enrollment in MUSI 3722, or permission of instructor. Designed for Music Education majors who are within two semesters of student teaching. This course prepares future teachers with classroom skills using one of the choral or instrumental ensembles or lab groups as their rehearsal medium.

MUSI 3642 English and Italian Diction and Vocal Literature. Course is designed for vocal performance majors, vocal music education majors and other serious voice students to assist them in mastering correct pronunciation and diction for singing standard English and Italian through the study and use of the International Phonetic Alphabet, and to familiarize them with many of the composers and songs which comprise the standard English and Italian vocal literature.

MUSI 3652 French Diction and Vocal Literature. Course is designed for vocal performance majors, vocal music education majors and other serious voice students to assist them in mastering correct pronunciation and diction for singing in French through the study and use of the International Phonetic Alphabet, and to familiarize them with many of the composers and songs which comprise the standard French vocal literature.

MUSI 3662 German Diction and Vocal Literature. Course is designed for vocal performance majors, vocal music education majors and other serious voice students to assist them in mastering correct pronunciation and diction for singing in German through the study and use of the International Phonetic Alphabet, and to familiarize them with many of the composers and songs which comprise the standard German vocal literature.

MUSI 3712 Basic Conducting. Principles of conducting choral and instrumental groups.

MUSI 3722 Advanced Ensemble Conducting. Prerequisite(s): 3712. Studies in advanced physical conducting techniques and score orientation, score reading, score analysis, and score interpretation.

MUSI 3732 Secondary Choral Methods. Prerequisite(s): 3712. Repertoire, rehearsal procedures, and vocal techniques for the post-secondary choral teacher.

MUSI 3741 Survey of Rock and Roll I. An examination of the cultural and musical elements that led to the advent of Rock and Roll, through an exploration of the evolution of the music from its inception to 1980 through lecture, reading and musical recordings.

MUSI 3743 Foundations of Music Education. Prerequisite(s): Full admission to Professional Education. Interdisciplinary approach including aspects of philosophy, aesthetics, sociology and psychology as they are applied in music in post-elementary public schools.

MUSI 3751 Survey of Rock and Roll II. An examination of the cultural and musical elements that led to the advent of Rock and Roll, through an exploration of the music from 1980 to the present.

MUSI 3753 (H) History of Music to 1600. Prerequisite(s): 1543 or consent of instructor. Aids music majors and other qualified students in understanding the musical styles, forms, schools, composers and instruments that developed in Western civilization from antiquity through the Renaissance period.

MUSI 3783 Form and Analysis. Prerequisite(s): MUSI 2553 and satisfactory
upper-division examination. Analysis of standard repertoire with emphasis on form and structural harmonic analysis.

MUSI 3763 History of Music from 1600-1800. Prerequisite(s): 1543 or consent of instructor. Aids music majors and other qualified students in understanding the musical styles, forms, schools, composers and instruments that developed in Western civilization from the Baroque period through to the Classical period.

MUSI 3772 Counterpoint. Prerequisite(s): 2563 and satisfactory upper-division examination. Analysis and application of contrapuntal techniques of the 18th century.

MUSI 3783 Form and Analysis. Prerequisite(s): 2563 and satisfactory upper-division examination. Analysis of standard repertoire with emphasis on form and structural harmonic analysis.

MUSI 3842 Marching Band Methods. Prerequisite(s): MUSI 2722; and MUSI 2832 or concurrent; and MUSI 2610. Organizational responsibilities and charting for public school marching bands. Must be taken concurrently with MUSI 2610 or MUSI 3610 (marching band).

MUSI 3852 Secondary Instrumental Methods. Prerequisite(s): 2832; 3712. This course is designed to give instrumental music education majors an in-depth look at administering a public school band program, including history and wind literature, literature selection, preparing budgets, preparing commissioning projects, working with administration, school boards and parent groups, organizational responsibilities, and charting for public school marching bands.

MUSI 3873 History of Music from 1800-Present. Prerequisite(s): 1543 or consent of instructor. Aids music majors and other qualified students in understanding the musical styles, forms, schools, composers and instruments that developed in Western civilization from the Romantic period through to the present.

MUSI 3901 Junior Recital. Prerequisite(s): Junior standing and consent of major applied music teacher.

MUSI 4042 Collaborative Piano. Prerequisite(s): Music major status or consent of instructor. This course introduces piano majors to the vast collaborative piano repertoire and helps them develop skills for future performing and/or teaching. Through coaching sessions and weekly reading and listening assignments, students will learn the difficult and rewarding art of collaborating with other performers. The course will focus on both vocal and instrumental accompanying repertoire. No credit for students with credit in MUSI 5042.

MUSI 4100 Music Industry Internship. 1-8 credits, max 8. Prerequisite(s): 90 credit hours and minimum 2.50 GPA in all music and business courses. Directed practical experiences in an approved work situation related to the music industry.

MUSI 4250 Major Organ. 1-4 credits, max 8. Prerequisite(s): 3250 and successful completion of recital attendance requirements.

MUSI 4260 Major Piano. 1-4 credits, max 8. Prerequisite(s): 3260 and successful completion of recital attendance requirements.

MUSI 4270 Major Voice. 1-4 credits, max 8. Prerequisite(s): 3270 and successful completion of recital attendance requirements.

MUSI 4280 Major Violin. 1-4 credits, max 8. Prerequisite(s): 3280 and successful completion of recital attendance requirements.

MUSI 4290 Major Viola. 1-4 credits, max 8. Prerequisite(s): 3290 and successful completion of recital attendance requirements.

MUSI 4300 Major Cello. 1-4 credits, max 8. Prerequisite(s): 3300 and successful completion of recital attendance requirements.

MUSI 4310 Major Double Bass. 1-4 credits, max 8. Prerequisite(s): 3310 and successful completion of recital attendance requirements.

MUSI 4340 Major Flute. 1-4 credits, max 8. Prerequisite(s): 3340 and successful completion of recital attendance requirements.

MUSI 4350 Major Oboe. 1-4 credits, max 8. Prerequisite(s): 3350 and successful completion of recital attendance requirements.

MUSI 4360 Major Clarinet. 1-4 credits, max 8. Prerequisite(s): 3360 and successful completion of recital attendance requirements.

MUSI 4370 Major Saxophone. 1-4 credits, max 8. Prerequisite(s): 3370 and successful completion of recital attendance requirements.

MUSI 4380 Major Bassoon. 1-4 credits, max 8. Prerequisite(s): 3380 and successful completion of recital attendance requirements.

MUSI 4390 Major Trumpet. 1-4 credits, max 8. Prerequisite(s): 3390 and successful completion of recital attendance requirements.

MUSI 4400 Major French Horn. 1-4 credits, max 8. Prerequisite(s): 3400 and successful completion of recital attendance requirements.

MUSI 4410 Major Trombone. 1-4 credits, max 8. Prerequisite(s): 3410 and successful completion of recital attendance requirements.

MUSI 4420 Major Euphonium. 1-4 credits, max 8. Prerequisite(s): 3420 and successful completion of recital attendance requirements.

MUSI 4430 Major Tuba. 1-4 credits, max 8. Prerequisite(s): 3430 and successful completion of recital attendance requirements.

MUSI 4440 Major Percussion. 1-4 credits, max 8. Prerequisite(s): 3440 and successful completion of recital attendance requirements.

MUSI 4450 Major Harpsichord. 1-4 credits, max 8.

MUSI 4490* Lessons in Applied Music (Major Field). 1-4 credits, max 4. Prerequisite(s): Bachelor’s degree or equivalent performing level in applied major field. Major applied music field.

MUSI 4600 Chamber Ensembles. 1 credit, max 12, Lab 1-3. Combinations of voice, keyboard, and orchestral instruments for performing chamber music, music theater and duo piano repertoire.

MUSI 4810* Problems in Musical Composition. 1-2 credits, max 8. Prerequisite(s): 1543 and consent of instructor. Practical experience in musical composition.

MUSI 4812 Performance and Analysis. 2 credits. Prerequisite(s): Junior standing as a music major or consent of instructor. An overview of the relationship between performance and analysis within the field of music theory. No degree credit for students with credit in MUSI 5812.

MUSI 4842 Choral Literature for the Classroom. Prerequisite(s): 3732. Exploration of the vast amPHyount of choral literature available to the choral conductor. Includes repertoire or conducting of choral ensembles.

MUSI 4890 Special Studies in Music Pedagogy. 2 credits, max 4. Prerequisite(s): Junior standing or consent of instructor. Survey of music pedagogical methods suitable for various levels and types of applied music.

MUSI 4901 Senior Recital. Prerequisite(s): Senior standing and permission of major applied music teacher.

MUSI 4912 Orchestration and Arranging. Prerequisite(s): Upper-division standing as a music major. Orchestrating for instrumental ensembles and arranging for choral ensembles.

MUSI 4940 Student Teaching in Public School Music. 6-10 credits, max 10. Prerequisite(s): Full admission to Professional Education, Directed observation, seminars, and supervised student teaching in selected elementary and secondary music programs. Graded on a pass-fail basis.

MUSI 4952* Music in the School Curriculum. Aims, content and motivation of the music education program in elementary and secondary schools from the standpoint of the classroom teacher, music specialist and administrator.

MUSI 4962* Music Education Seminar. Research into latest developments of public school choral and instrumental music.

MUSI 4972 Post Tonal Analysis. Prerequisite(s): 2553 and successfully pass the Upper-Division Theory Barrier Exam. Techniques for the analysis of music from the 20th and 21st centuries, including set analysis.

MUSI 4990* Selected Studies in Music and Music Education. 1-3 credits, max 8. Short-term area studies in music and music education.

MUSI 4993 Senior Honors Project. Prerequisite(s): Departmental invitation, senior standing, Honors Program participation. A guided program in musicological research, music composition, or music performance, ending with an honors project under the direction of a faculty member with a second faculty member to complete an examining committee. Required for graduation with departmental honors in music.

MUSI 5002* Final Degree Performance. Prepare and perform or conduct a public concert or recital of significant repertoire.

MUSI 5012* Final Degree Project and Oral Examination. Final capstone project in performance or conducting as assigned by disciplinary area, and cumulative oral examination before a designated committee of faculty. Detailed information on acceptable projects are found in the Graduate Music Student Handbook.

MUSI 5022* Graduate Theory Review. Designed as a review of musical analysis materials and techniques necessary to prepare students for further studies in music analysis at the graduate level. Enrollment is mandated or encouraged based on entrance exam scores.

MUSI 5032* Graduate History Review. A review of the development of Western European art music from the medieval era to the present day to enable graduate students to study music history at the graduate level. Enrollment is mandated or encouraged based upon entrance exam scores.

MUSI 5042* Collaborative Piano. Prerequisite(s): Music major status or consent of instructor. This course introduces piano majors to the vast collaborative piano repertoire and helps them develop skills for future performing and/or teaching. Through coaching sessions and weekly reading and listening assignments, students will learn the difficult and rewarding art of collaborating with other performers. The course will focus on both vocal and instrumental accompanying repertoire. No credit for students with credit in MUSI 4042.

MUSI 5113* Introduction to Graduate Studies in Music. Prerequisite(s): Admission to Master of Music program. Understanding of the resources available for research in the field of music. Explanation of the types of research materials needed for classes in the Master of Music degree program, as well as providing the groundwork for success in the professional world as a music educator and
performer.

MUSI 5480* Lessons in Applied Music (Minor Field). 1-4 credits, max. 12. Prerequisite(s): Bachelor's degree or equivalent performance level in applied major field.

MUSI 5490* Lessons in Applied Music (Major Field). 1-4 credits, max. 12. Prerequisite(s): Bachelor's degree or equivalent performance level in applied major field. Private Lessons.

MUSI 5512* Advanced Studies in Music Literature and Pedagogy I. Prerequisite(s): 3753, 3763 or equivalent. Techniques of successful programming, teaching and performance of ensemble literature through a survey of repertoire appropriate to the student's chosen medium.

MUSI 5522* Advanced Studies in Music Literature and Pedagogy II. Prerequisite(s): 3753, 3763 or equivalent. A continuation of 5512, with emphasis upon music of the 20th century and its attendant specialized performance techniques.

MUSI 5600* Chamber Ensembles. 1-2 credits, max. 6, Lab 1-3. Combinations of voice, keyboard, orchestral instruments for performing chamber music, music theater and duo piano repertoire.

MUSI 5610* University Bands. 1-2 credits, max. 12, Lab 3-5. Large ensembles. (Same course as 2610 & 3610)

MUSI 5620* Symphony Orchestras. 1-2 credits, max. 12, Lab 4. Large ensembles. (Same course as 2620 & 3620)

MUSI 5630* University Choral Ensembles. 1-2 credits, max. 12, Lab 3-5. Large ensembles. (Same course as 2630 & 3630)

MUSI 5712* Advanced Studies in Conducting I. Prerequisite(s): 3712 and 3722 or equivalent. Acquisition of an expressive conducting gestural vocabulary as it relates to the student's chosen medium.

MUSI 5722* Advanced Studies in Conducting II. Prerequisite(s): 5712. A continuation of 5712, focusing upon the gestural vocabulary as it relates to the specific complexities of contemporary music.

MUSI 5733* Techniques of Pedagogy and Performance. Prerequisite(s): 3712 and 3722 or equivalent. Advanced techniques and modes for preparing music for performance.

MUSI 5742* Conducting Practicum. Prerequisite(s): 5712, 5722. Supervised conducting opportunities with major OSU ensembles or approved off-campus ensembles.

MUSI 5750* Seminar in Music History. 3 credits, max. 9. Prerequisite(s): 3753 and 3763 or equivalent. Major European musical genres and pedagogical methods of a specified time in musical history. Acquaintance with source materials from the specified period to facilitate a knowledge of performance of genres studied. Topics vary.

MUSI 5812* Performance and Analysis. 2 credits. Prerequisite(s): Passing score on Graduate Theory Placement Exam or MUSI 5022. An overview of the relationship between performance and analysis within the field of music theory. No degree credit for students with credit in MUSI 4812.

MUSI 5842* Music Repertoire. Survey of music literature suitable for teaching various levels in applied music.

MUSI 5962* Analytical Techniques in Music I, Prerequisite(s): Passing score on Graduate Theory Placement Exam or 5022. A critical survey of important analytical approaches to tonal and post-tonal music.

MUSI 5972* Analytical Techniques in Music II, Prerequisite(s): Passing score on Graduate Theory Placement Exam or 5022. A continuation of 5962. Topics will include Schenkerian analyses, set theory and other contemporary analytical approaches to post-tonal music.

Natural Resource Ecology and Management (NREM)

NREM 1012 Introduction to Natural Resource Ecology and Management. Introduction to the wide variety of natural resources found globally with a focus on Oklahoma ecosystems. Overview of the ecology and management of natural resources in the pine-hardwood forest, the Cross Timbers, and the tallgrass, mixed-grass and shortgrass prairies. Academic and career options presented through guest speakers.

NREM 1014 (L,N) Introduction to Natural History. Lab 2. The study of living organisms especially their origins, life histories, behaviors, conservation, and unique adaptations and activities reproducing and relating to their environment. Laboratory emphasis is on observation and investigation of the diversity and adaptations of living organisms.

NREM 1113 Elements of Forestry. Survey of forestry as an art, science and profession including forestry resource management theory, forest distribution and ownership, history of forest resource policy development, forest protection, wildlife interactions, forest ecosystem process, current issues, and career opportunities. Previously offered as NREM 1114.


NREM 2013 Ecology of Natural Resources. Prerequisite(s): BIOL 1114 or PLNT 1213. Introductory focus on understanding and applying general ecological principles to agricultural and natural ecosystems. Emphasis on relationships between climate, soils, agricultural, and natural ecosystems. Topics include nutrient cycles, energy flow, species interactions, biological diversity, productivity, sustainability, and landscape and ecosystem management.

NREM 2103 Forest Measurements I. Lab 2. Prerequisite(s): 1113: 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.


NREM 2134 Dendrology. Lab 4. Identification, taxonomy and distribution of forest trees and shrubs of the United States; their environmental requirements and utilization.

NREM 3012 Applied Ecology Laboratory. Lab 2. Prerequisite(s): 3013 or concurrent. Field experience aimed at navigating and working effectively and safely in the natural environment. Identification, measurement and interpretation of abiotic and biotic components to understand and describe ecosystem function and current natural resource management tools and issues. Focus on representative forest, grassland, and aquatic ecosystems.

NREM 3013 Applied Ecology and Conservation. Prerequisite(s): BOT 1404 or BIOL 1604; SOIL 2124 preferred. Development of critical thinking for conservation and land management through the application of ecological concepts and theory. Principles of population, community, ecosystem and landscape ecology, with applications to management of wildlife, fisheries, forest and rangeland resources. Application of scientific method and literature to natural resource ecology and management.

NREM 3063 Natural Resource Biometrics. Lab 2. Prerequisite(s): STAT 2013; and MATH 1513 or 1483. Application of statistical concepts to problems in natural resource sampling and estimation including simple random sampling, stratified sampling, regression analysis, double sampling and ratio and regression estimation. Statistical analysis using spreadsheets. Applications to forest, range and wildlife management.

NREM 3073 Ecological Genetics. Prerequisite(s): BOT 1404 or BIOL 1604, STAT 3013 and any ecology course. Physical basis and principles of inheritance and genetic variation in populations, and how they arise, are quantified, and manipulated by nature and man. Concepts in population and quantitative genetics and their relationship to the evolution of natural and managed populations.

NREM 3083 Geospatial Technologies for Natural Resources. Lab 3. Prerequisite(s): MATH 1483 or 1493 or 1513. Principles and application of geospatial technologies for natural resource ecology and management including remote sensing (aerial photography and satellite data), geographic information system (GIS) and global positioning system (GPS) technologies and principles of inheritance resources to sustain a broad array of uses and values, and to understand associated ecological, social, policy, and ethical issues. Includes visitations to private and public natural resource lands and projects.


NREM 3213 Forest Ecology. Lab 2. Prerequisite(s): BOT 1404. Study of the forest ecosystem, its structure, function, physical environment, biotic components, change over time and management implications.

NREM 3224 Silviculture. Prerequisite(s): NREM 2013, or NREM 3012 and NREM 3013, or BIOL 3034. Theory and practice of controlling forest establishment, composition, structure, and growth to meet multiple objectives. Principles and techniques of natural and artificial regeneration, intermediate cultural treatments, and silvicultural systems applicable in various forest cover...
types. Two-day field trip is required.

NREM 3323 Forest Economics and Finance. Prerequisite(s): AGEC 1114. Economic factors and analytical methods influencing decisions in forest resource management; factors affecting the production of wood products; arithmetic of interest and investment criteria; economics of non-market goods.

NREM 3343 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 administration and policy, and current issues in forestry. No credit for NREM in Forestry options.

NREM 3502 Wildlife Law Enforcement. Prerequisite(s): Junior standing and consent of instructor. Survey of state and federal wildlife laws with emphasis on Oklahoma statutory and regulatory laws pertaining to wildlife. Lectures, guest lectures, videotapes and field exercises.

NREM 3503 Principles of Wildlife Ecology and Management. Prerequisite(s): NREM 3012 and NREM 3013, or BIOL 3034 or concurrent. An introduction to the biological basis of the management of wildlife habitats and populations.


NREM 3613 Principles of Rangeland Management. Prerequisite(s): NREM 2013 recommended. Overview of the science of applying ecological principles to manage rangeland resources, including rangeland characteristics, goods and services provided by rangelands; primary threats to rangelands; North American rangeland resources; principles of grazing management and current topics in range management.

NREM 3713 Wildland Fire Ecology and Management. Prerequisite(s): 2013 or any ecology course and BIOL 1114. Fundamentals of wildland fire including chemistry and physics of fire, fuel and weather influences on fire behavior, ecological effects of fire, interaction of fire and vegetation, history of humans and fire, fire management and suppression, and prescribed fire.

NREM 4001 Issues in Global Change. Prerequisite(s): (NREM 3012 and NREM 3013) or BIOL 3034 or concurrent. Student led discussion to learn the causes and consequences of global change and practical implications for natural resource ecology and management.

NREM 4023 Restoration Ecology. Prerequisite(s): NREM 2013, or NREM 3012 and NREM 3013, or BIOL 3034. Application of ecological theory to the practice of ecological restoration to improve populations, communities, and ecosystems degraded directly or indirectly by human activities.

NREM 4033 Ecology of Invasive Species. Prerequisite(s): BIOL 1114; and BOT 1404 and BIOL 1604 recommended. Ecological principles and their application to invasive species. Population level characteristics; community and ecosystem level effects of a wide variety of taxa including microbial, fungal, plant, invertebrate, and vertebrate examples. Global consequences and governmental policies/programs designed to limit the spread of invasives.

NREM 4043* Natural Resource Administration and Policy. Prerequisite(s): Senior standing. Natural resource policy and legislation; ethics relating to natural resources; natural resource organizations and how they function to include structure, supervision, and financing of federal, state, and private natural resource enterprises.

NREM 4053* Natural Resource Recreation. Ecological, historical, social and policy basis for recreational use and management of natural resources, including an analysis of planning, management, and administrative frameworks for providing a diversity of recreational opportunities, benefits, and resource values.

NREM 4063 Ecotourism and Wilderness Management. Principles, applications, management approaches, case-studies and issues associated with ecotourism and wilderness use for a diversity of values and benefits. Historical, social, cultural, economic, political, and ecological foundations and implications of nature-based tourism and wilderness recreation.

NREM 4093 (I) Natural Resources, People and Sustainable Development. Prerequisite(s): Consent of instructor. Relationship between people, the land, and associated natural resources in the developing world, including the ecological and cultural basis for resource use and development. Examines issues of traditional agriculture and deforestation, and explores sustainable strategies for land use, resource management, and community development. Includes two-week study abroad component.

NREM 4213 Forest Biology. Prerequisite(s): BOT 1404. The response of trees and forests to environmental, cultural, and biotic factors. Application of physiological and ecological principles in predicting the effects of biotic and abiotic factors on tree growth and community interactions.

NREM 4323* Timber Management. Prerequisite(s): 3323 or AGEC 3213, and 3224. Regulation of forest growing stock to meet management objectives. Land and timber appraisals. Organization of the forest enterprise to meet financial objectives of management.

NREM 4333* Forest Resource Management: Planning and Decision-Making. Lab 2. Prerequisite(s): 4323. Integrated problem solving, to apply biological, quantitative, economic, political, and administrative principles in solving forest resource management problems.

NREM 4403 Wetland Ecology and Management. Prerequisite(s): NREM 3012 and NREM 3013, or BIOL 3034 or consent of instructor. Ecology, classification, restoration, and management of wetlands. Adaptations of wetland plants and animals, structure and function of wetlands, field identification of wetland plants, restoration techniques, wetland classification systems, management and conservation of wetlands, and regulatory processes.

NREM 4411* Water Quality Laboratory. Lab 3. Prerequisite(s): 4443, previous or concurrent. Techniques to monitor surface water for non-source point pollution source. Water sampling strategies, chemical and physical analysis for nutrients, sediment and other constituents, biological analysis, quality control and interpretation of results. One required field trip.

NREM 4414* Fisheries Management. Prerequisite(s): NREM 3012 and NREM 3013, or BIOL 3034. Techniques and principles involved in management of fishes. Field trip fee required.

NREM 4424 Fisheries Techniques. Prerequisite(s): NREM 4414. Research techniques and methodology in fisheries science, including sampling design, habitat measurements, sampling gears and abundance estimation, age and growth analysis, recreational surveys, data analysis, and report writing. No credit for students with credit in NREM 5424.

NREM 4443 Watershed Hydrology and Water Quality. Lab 2. Processes that comprise the hydrologic cycle and how land use affects those processes and the quantity and quality of water from watersheds, focusing on surface water from forest, range and agricultural watersheds. Measurement and evaluation of water quantity and quality.

NREM 4452 Pond Management. Prerequisite(s): BIOL 1114. Principles and practice of aquatic plant management, pond construction, and maintenance, fish population management, and human factors associated with pond ownership and management. No credit for students with credit in NREM 5452.

NREM 4453 Aquaculture. Prerequisite(s): BIOL 1114. Introduction to the principles of freshwater fishfin production with an emphasis on warm water species. No credit for student having completed NREM 5453.

NREM 4463 Stream Restoration and Management. Lab 2. Prerequisite(s): 4443 or BAE 4313 or consent of instructor. Streams and associated riparian areas. Studying functions in stream water quantity and quality and providing aquatic habitat. Fluvial geomorphology, stream assessment and classification, riparian area functions and management, and concepts and comparison of methods of stream restoration. Field measurements of stream and riparian characteristics. Two overnight field trips required.

NREM 4464* Ornithology. Lab 2. Prerequisite(s): BIOL 1604. Classification, evolution, distribution, identification, life histories, and morphological, ecological, and behavioral adaptations of birds. Two weekend field trips required. (Same course as BIOL 4464*).

NREM 4473 Global Issues of Water and Ecosystem Management. Principles and tools (NREM 3012, or NREM 3013, or BIOL 3034) and consent of instructor. Principles and concepts related to integrated fresh water resource management and its provisions for ecosystem and human needs. Examination of water issues related to ecosystem management practices in geographic locations including Asia, Africa, North America and South America.

NREM 4524 Wildlife Management Techniques. Lab 4. Prerequisite(s): 3503, ENGL 3323 strongly recommended. Research techniques and methodology in wildlife science. Experimental design, wildlife population and habitat analysis, wildlife and vegetation sampling techniques, aging and sexing techniques, and report preparation and presentation.

NREM 4533 Wildlife Management for Game Species. Prerequisite(s): NREM 3012 and NREM 3013, or BIOL 3034; and NREM 3503. Life history attributes and habitat relationships of game species relative to life history strategies; conservation and management strategies for game species; and federal and state policies influencing game species management.

NREM 4543 Wildlife Management for Biodiversity. Prerequisite(s): NREM 3012 and NREM 3013, or BIOL 3034; and NREM 3503. Identification, life history, and conservation management issues affecting non-game species in North America, stressing rare, threatened, and endangered species occurring in Oklahoma. Principles of landscape ecology, wildlife management, and conservation biology applied to management scenarios aimed at recovery of rare species and biodiversity conservation at broad scales.

NREM 4613 Rangeland Resource Planning. Inventory of ranch resources, survey and evaluation of ranch practices, and economic analysis. Development of a comprehensive ranch management plan. Managing rangeland and ranch resources in a social context. Written and oral reports. Field trips required. (Same course as ANSI 4973)

NREM 4783 Prescribed Fire. Lab 3. Prerequisite(s): NREM 3613. Use of prescribed fire to accomplish specific land management objectives. Fire policy, land, weather, equipment, conducting burns, post-burn mop-up and writing prescribed fire plans.

NREM 4793 Advanced Prescribed Fire. Lab 3. Prerequisite(s): 4783 or
acquatic ecology or wetland management recommended. Principles and theory of wetland ecology with a focus on wetland processes, functions, and services. Topics include wetland geomorphology, biogeochemistry and hydrology of wetlands, wetland functions and services, wetland development, wetland restoration, water issues, wetland policy, philosophy of wetland management, and educating society about wetlands. (Same course as BIOL 5403)

NREM 5424* Fisheries Techniques. Prerequisite(s): NREM 4414. Research techniques and methodology in fisheries science, including sampling design, habitat measurements, sampling gears and abundance estimation, age and growth analysis, recreational surveys, data analysis and report writing. No credit for students with credit in 4424.

NREM 5433* Fisheries Science. Prerequisite(s): 4414 or equivalent or consent of instructor. Principles of fisheries science as they relate to fish and aquatic biota, their habitats, and the humans who utilize them.

NREM 5443* Watershed Hydrology and Water Quality. Lab 2. Processes that comprise the hydrologic cycle and how land use affects those processes and the quantity and quality of water from watersheds, focusing on surface water from forest, range and agricultural watersheds. Measurement and evaluation of water quantity and quality. Intended for graduate students new to the water resources field. No credit for students having completed 4443.

NREM 5452* Pond Management. Prerequisite(s): BIOL 1114. Principles and practice of aquatic pond management, pond construction and maintenance, fish population management, and human factors associated with pond ownership and management. No credit for students with degree credit in NREM 4452.

NREM 5453* Aquaculture. Prerequisite(s): BIOL 1114. Introduction to the principles of freshwater fish production with an emphasis on warm water species. No credit for student having completed NREM 4453.

NREM 5463* Stream Restoration and Management. Lab 2. Streams and associated riparian areas and their functions in maintaining water quantity and quality and providing aquatic habitat. Fluvial geomorphology, stream assessment and classification, riparian area functions and management, and concepts and comparison of methods of stream restoration. Field measurements of stream and riparian characteristics. Two overnight field trips required. No credit for students having completed 4463.

NREM 5473* Stream Ecology. Prerequisite(s): Course in ecology strongly recommended. Ecology of streams and rivers, physical and chemical properties, benthic assemblages and interdependence, ecosystem processes, biogeochemical cycling. No credit for students having completed NREM 4473.

NREM 5483* Ecohydrology. Prerequisite(s): 2013 or 3213 or BIOL 3034 or equivalent with instructor consent. Concepts, framework and challenges in ecohydrology. Soil water control on vegetation structure, function and distribution. Vegetation feedback on water budget in water limited ecosystems. Ecological and hydrological interaction associated with land use, land cover change and climate variability.

NREM 5493* Social Dimensions in Aquatic Ecology. Prerequisite(s): consent of instructor. Role of humans as implementers of policy, as users of resources, and as scientists in aquatic ecology.

NREM 5523* Population Ecology. Lab 2.5. Prerequisite(s): BIOL 3034, MATH 1513. Theory and principles of predicting and analyzing population abundance and dynamics. Life history theory, foraging theory, habitat selection, population genetics, and species interactions. (Same course as BIOL 5523*)

NREM 5563* Forest Wildlife Ecology. Prerequisite(s): Course in ecology strongly recommended. Vertebrate species diversity in the woodlands and forests of Minnesota. 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.

NREM 5573* Grassland and Desert Wildlife Ecology. Prerequisite(s): Course in ecology strongly recommended. 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.

NREM 5583* Wetland Wildlife Ecology. Prerequisite(s): A course in wildlife ecology recommended. Ecology development of wetland dependent wildlife species with an emphasis on the autecology, adaptations for inhabiting wetland systems, and management problems associated with these taxa.

NREM 5660* Special Topics in Rangeland Science. 2-4 credits, max 4. Prerequisite(s): Consent of instructor. Selected topics in rangeland research methods or other rangeland topics.

NREM 5673* Rangeland Resources Watershed Management. Management of anthropogenic activities and physical/biological functions or processes on water and rangeland watersheds. Emphasizes preventative and restorative strategies in a natural resource rangeland setting. Course available online only through distance education.

NREM 5682* Grassland Plant Identification. Prerequisite(s): Consent of instructor. Study and identification of plants that have ecological and/or agricultural importance in the Great Plains. Grassland ecosystems and plant characteristics including forage value, palatability, and utilization by both 2016-2017 University Catalog
domestic livestock and wildlife. Cultural and historical uses of grassland. Course available online only through distance education.

NREM 5692* Grassland Monitoring and Assessment. Vegetation sampling theory and plot selection. Quantitative measures used in vegetation analysis, root growth, and utilization. Use of the similarity index, and plant community health and trends for grassland monitoring and assessment. Course available online only through distance education.

NREM 5693* Principles of Forage Quality and Evaluation for Ruminants. Prerequisite(s): Consent of instructor. Chemical characteristics of forage components and the laboratory procedures used to evaluate forages for grazing livestock include ruminant physiology and digestion and influence forage feeding value. Students should have a strong background in the basic principles of chemistry, ruminant nutrition, and plant physiology. Course available online only through distance education.

NREM 5713* Grassland Fire Ecology. Ecological effects of fire on grassland ecosystems. Examination of the history of fire, societal use of fire, fire behavior in relation to fuel and weather, and conducting and safety of prescribed burns. Course available online only through distance education.

NREM 5723* Ecology of Fire Dependent Ecosystems. Prerequisite(s): Any ecology course. Role of fire and the interactions with land use, weather, and climate change in fire-dependent ecosystems. Responses of species composition, diversity, annual net primary productivity, nutrient cycling, and ecosystem management in diverse ecosystems.

NREM 5783* Prescribed Fire. When to use prescribed fire and how to use prescribed fire to accomplish specific land management objectives. Writing prescribed fire plans, policy and laws, weather, equipment, conducting burns, and postburn monitoring and trips required.

NREM 5793* Advanced Prescribed Fire. Lab 3. Prerequisite(s): 4783 or consent of instructor. Preparing fire plans and executing prescribed fires as the fire boss. No credit for both 4793 and 5793.

NREM 6000* Doctoral Dissertation. 1-15 credits, max 45. Independent research planned, conducted and reported in consultation with major professor.

NREM 6010* Advanced Topics and Conference. 1-6 credits, max 6. Prerequisite(s): MS degree. Supervised study of advanced topics. A reading and conference course designed to acquaint the advanced student with fields not covered in other courses.

Nursing (NURS)

NURS 3000 Registered Nursing Experience/License. 1-20 credits. Prerequisite(s): Associate degree or diploma in nursing plus RN license. Credit to be determined by a successful passing of the NCLEX (National Council Licensing Exam) and holding a current active Registered Nursing License from a state board of nursing.

NURS 3013 Theoretical and Conceptual Foundations of Nursing. Prerequisite(s): Associate degree or diploma in nursing plus RN license. An introduction to theories that is specific to the health care environment. Analysis of the theoretical frameworks of nursing theorists to include: Florence Nightingale, Jean Watson, Patricia Benner, Virginia Henderson and Margaret Neuman, and address the tenets of inter-professional collaborative practices. The application of these theories to health and wellness promotion will be examined.

NURS 3025 Health Assessment, Wellness and Community Health. Prerequisite(s): Associate degree or diploma in nursing plus RN license. Introduction to health strategies for communities and diverse populations with social, cultural, environmental, and economic dimensions. Students will revisit the theoretical frameworks of nursing theorists, Core Competencies for Interprofessional collaborative Practice, and the wellness model. Application to health and wellness promotion in the community will be examined through a clinical component.

NURS 3033 Cultural Considerations in Health Care. Prerequisite(s): Associate degree or diploma in nursing plus RN license. Prepares students to become culturally competent health care providers and to provide care of a culturally diverse population. Exploration of institutional, sociocultural and economic factors that impact health and wellness of minority populations.

NURS 3034 Global and Public Health. Prerequisite(s): Associate degree or diploma in nursing plus RN license. Explores the impact of professional nursing on the health and well-being of individuals globally. This relationship between health and illness of larger populations of individuals is an ever-evolving facet of being a professional nurse.

NURS 4013 Healthcare Policy, Finance and Regulatory Environments. Prerequisite(s): Associate degree or diploma in nursing plus RN license. NURS 3013, NURS 3025, NURS 3033, NURS 3034. Provides information, perspectives and strategies that nurses need to develop the capacity and skills to influence reform, quality of care and access to health. Active learning strategies include individual and group learning experiences.

NURS 4023 Trends and Issues in Nursing. Prerequisite(s): Associate degree or diploma in nursing plus RN license. NURS 3013, 3025, 3033, 3034. Current and emerging topics that directly affect the professional nurse. Concepts include professionalism, professional values, advanced nursing practice, future of nursing practice, case management, changing trends in managed health care, informatics, fiscal responsibility, ethical/legal issues, and global health.

NURS 4033 Leadership and Management in Nursing. Prerequisite(s): Associate degree or diploma in nursing plus RN license. NURS 3013, 3025, 3033, 3034. Exploration and analysis of leadership and management theories and competencies to develop inter-professional leadership skills, demonstrate leadership and management abilities and integrate leadership and management competencies into their professional nursing practice.

NURS 4043 Nursing Research and Evidence Based Practice. Prerequisite(s): Associate degree or diploma in nursing plus RN license. NURS 3013, NURS 3025, NURS 3033, NURS 3034. Students will gain basic understanding of the research process and its applications to nursing and evidence-based practice. Course content includes evidence-based practice, appraisal of literature, research design, research ethics, and statistical methodology. Qualitative, quantitative, and mixed methodology research, data summarization, statistical analysis, and principles of measurement will be reviewed.

NURS 4050 RN-BSN Capstone Prerequisite(s): Associates degree or diploma in nursing plus Nursing license. NURS 3013, NURS 3025, NURS 3033, NURS 3034. Addressing health and wellness across the lifespan, this course emphasizes the role of the RN in the areas of interprofessional collaborative practice, leadership, management, policies, informatics, evidence-based practice, health, wellness and research.

Nutritional Sciences (NSCI)

NSCI 2111 Professional Careers in Nutritional Sciences. Prerequisite(s): For students interested in Allied Health, Community Nutrition or Nutrition and Exercise or consent of instructor. Career opportunities in health professions. Roles and responsibilities of health care professionals. Routes to professional memberships and current issues in professionalism.

NSCI 2112 Foods of the African Diaspora: Chronology, Evolution and Impact. An exploration of the evolution of African American foodways and their physical health impacts within the historical contexts of slavery, emancipation, cultural development, religion, and traditional health beliefs.

NSCI 2114 (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.

NSCI 2211 Professional Careers in Dietetics. Prerequisite(s): NSCI students or consent of instructor. Career opportunities in Dietetics. Roles and responsibilities of Dietitians. Routes to professional memberships and current issues in professionalism.

NSCI 2850 Special Topics in Nutritional Sciences. 1-3 credits, max 4. Study of specific consumer education issues or topics in nutritional sciences.

NSCI 3011 Nutrition and Evidence-based Practice I. Prerequisite(s): NSCI 2114 and STAT 2013 or STAT 2023. Understanding basic research designs and methodologies, ethics in research, and the use of research in the development of evidence-based recommendations for healthy individuals, applying statistics, and interpreting data in nutrition research.

NSCI 3021 Nutrition and Evidence-based Practice II. Prerequisite(s): NSCI 3011 and BIOL 3204 or concurrent. Understanding the pathophysiology of chronic disease and the role of nutrition in the prevention and treatment of these diseases. Course builds on an understanding of physiology and of nutrition research from BIOL 3204 and NSCI 3011. Ethics in research.

NSCI 3133 Science of Food Preparation. Lab 3. Prerequisite(s): HRAD 1114, NSCI 2114, CHEM 3015. Scientific principles underlying functions of food ingredients, recipe/menu modification, diet management for disease states and food safety.

NSCI 3223 Nutrition Across the Life Span. Prerequisite(s): 2114 or equivalent. Nutritional needs and dietary concerns of individuals from conception through old age.

NSCI 3440 Nutritional Sciences Pre-Professional Experience. 1-3 credits, max 9. Prerequisite(s): HS 1112 or 3112 (or concurrent). Student arranged with instructor, approved job, shadowing, work or volunteer experience in professional settings related to the Nutritional Sciences options. Forty hours of experience required per credit hour.

NSCI 3543 (L) Food and the Human Environment. Impact of the various chronic diseases that affect food availability, production, processing, distribution, and consumption of food in the world. Interrelatedness of foods, challenges of solutions to the world food crisis.

NSCI 3813 Nutrition Assessment and Counseling Skills. Lab 2. Prerequisite(s): 2114 and 3223 and HDFS 2113 and PSYC 1113; or consent of instructor. Theory and practice of counseling and interviewing skills as applied to nutrition counseling. Collection and interpretation of anthropometric and chemical data necessary to determine nutritional status.

NSCI 3991 Dietetics Career Experience. Observational career experience in various settings with practicing registered dietitians.

NSCI 4013* Experimental Foods. Lab 3. Prerequisite(s): 3133 or consent of instructor. Investigations in physical, chemical and sensory, and functional...
properties of foods and their ingredients. Research project applying food science and nutrition principles to product development.

NSCI 4021 Nutrition and Evidence-based Practice III. Prerequisite(s): 3011 and 3021. In-depth study of major controversial issues in the field of nutrition. Course builds on understanding of nutrition research from NSCI 3011 and 3021. Review and analysis of current research. Ethics in research.

NSCI 4023 Nutrition in the Pathophysiology of Chronic Disease. Prerequisite(s): 2114, NSCI 3011, NSCI 3223 and BIOL 3204. Analysis of the role of specific nutrients in health maintenance and disease prevention. Communication of nutrition information to the public.

NSCI 4111 Professional Preparation for Careers in Dietetics. Prerequisite(s): 4854 or concurrent, or consent of instructor. Preparation of supervisors, practitioners and supporting documents. Options for professional credentials, graduate school, and careers. Professional issues in dietetics.

NSCI 4123 Human Nutrition and Metabolism I. Prerequisite(s): 2114 and CHEM 3015 or CHEM 3053 and BIOL 3204 and consent of instructor. Examining the chemical characteristics and functions of macronutrients; digestion, absorption, transport and metabolism of macronutrients; control of intermediary metabolism and metabolic pathways. No credit for students with degree credit in NSCI 5303.

NSCI 4133 Nutrition for Exercise and Sport. Prerequisite(s): HHP 3114, NSCI 4123 and BIOL 3653 or consent of instructor. Application of principles of nutrient metabolism as they relate to physical activity, sport and health.

NSCI 4143 Human Nutrition and Metabolism II. Prerequisite(s): 4123 or consent of instructor. Chemical characteristics, absorption, transport, functions, requirements and health implications of vitamins and minerals. Discussion of phytochemicals and their roles in relation to health maintenance and disease prevention. No credit for students with degree credit in NSCI 5533.

NSCI 4323 Human Nutrition and Metabolism. Prerequisite(s): BIOL 3204, BIOL 3653 or concurrent and NSCI 2114 or consent of instructor. Digestion, absorption and metabolism of nutrients; functions and health implications in the human organism.

NSCI 4331 Quantity Food Production Practicum. Prerequisite(s): NSCI 2114, HRAD 1114, 2021, 3213 or MGMT 3013, restricted to NSCI majors. Observation and practice in real-life quantity food production settings. Students will need immunizations, TB tests, and background checks completed before the semester of enrolment in the course.

NSCI 4373 Principles of Nutrition Education. Prerequisite(s): 2114, 3223, or consent of instructor. Analysis of various methods, strategies, theories, resources and evaluation methods for nutrition education. Principles of effective nutrition counseling. Overview of community nutrition programs.

NSCI 4573 Management in Dietetics. Prerequisite(s): ACCT 2103 or HRAD 2152; and HRAD 3213 or MGMT 3013. Management practices in the field of dietetics including program, clinical and food systems management.

NSCI 4643 Capstone for Nutritional Sciences. Prerequisite(s): Senior standing in NSCI or consent of instructor. Integration of the body of knowledge in nutritional sciences. Examination of the research basis for defining and solving critical issues. Oral and written reports.

NSCI 4733 Community Nutrition. Prerequisite(s): 2114 and 3223 or consent of instructor. Application of nutrition, education and communication principles to community nutrition programs and services. Field work required.

NSCI 4850* Special Unit Studies in Nutritional Sciences. 1-3 credits, max 6. Special units of study in nutritional sciences.

NSCI 4854 Medical Nutrition Therapy I. Prerequisite(s): NSCI 3223, NSCI 3813 and NSCI 4123 or NSCI 4023 or concurrent enrollment. Physiological and metabolic bases for dietary modifications in disease states.

NSCI 4864 Medical Nutrition Therapy II. Prerequisite(s): 4854. A continuation of 4854, Medical Nutrition Therapy I.

NSCI 4900 Honors Creative Component. 1-3 credits, max 3. Prerequisite(s): College of Human Sciences Honors Program participation, senior standing. Guided creative component for students completing requirements for College Honors in the College of Human Sciences. Thesis, creative project or report under the direction of a faculty member in the major area, with second faculty reader and oral exam.

NSCI 5000* Master’s Thesis. 1-6 credits, max 6. Prerequisite(s): Consent of adviser. Individual research and thesis that will fulfill the requirements for the master’s degree.

NSCI 5011* Special Topics in Nutritional Sciences. Prerequisite(s): NSCI graduate standing. Orientation to graduate study and research in nutritional sciences.

NSCI 5012* Public Policy Development in Food, Nutrition and Related Programs. Rationale underlying governmental programs in food and nutrition and human sciences. An assessment of the effectiveness of the programs.

NSCI 5013* Cost Control in Food Service Systems. Prerequisite(s): Admission to Great Plains IDEA online MS in Dietetics. An overview of accounting, cost controls, and financial management in food service. Special emphasis placed on understanding the topics and applying them to the theoretical and/or practical research for food service systems. Web-based instruction.

NSCI 5023* Advanced Nutrition in the Pathophysiology of Chronic Disease. Prerequisite(s): Biochemistry and advanced human nutrition/metabolism, or consent of instructor. In-depth analysis of the role of specific nutrients in health maintenance and disease prevention.

NSCI 5033* Macronutrients in Human Nutrition. Prerequisite(s): Biochemistry and advanced human nutrition/metabolism, or consent of instructor. Characteristics, biological roles, digestion, absorption, transport and metabolism of the macronutrients.

NSCI 5043* Micronutrients in Human Nutrition. Prerequisite(s): 5033 or consent of instructor. In-depth study of vitamins and minerals and their interrelationships in metabolism.

NSCI 5053* Functional Foods for Chronic Disease Prevention. Prerequisite(s): Admission to Great Plains IDEA MS in Dietetics or consent of instructor. Integrate and evaluate the regulatory principles, food science, nutrient science and nutritional metabolism for the development of functional foods, nutraceuticals, and dietary supplements for chronic disease prevention. Web-based instruction.

NSCI 5103* Grant Writing for the Professional. Prerequisite(s): Admission to the Great Plains IDEA online MS in Dietetics or consent of instructor. Grant proposal preparation experience including written critique of proposals and budget planning. Designed for the working professional. Web-based instruction.

NSCI 5123* Research Methods in Nutritional Sciences. Basic components of the research process and application of research methods to nutritional sciences.

NSCI 5133* Advanced Nutrition for Exercise and Sport. Prerequisite(s): Intro nutrition and biochemistry or consent of instructor. Advanced study of nutrition and metabolism relating to physical activity, sports and health.

NSCI 5203* Nutrition in Wellness. Prerequisite(s): Admission to the Great Plains IDEA online MS in Dietetics or consent of instructor. Wellness promotion through nutrition. Nutritional risk and protective factors will be examined as they relate to public health and individual nutrition. Web-based instruction.

NSCI 5210* Contemporary Issues in Food Service. 3-9 credits, max 9. Prerequisite(s): Admission to the Great Plains IDEA online MS in Dietetics program or consent of instructor. Contemporary issues in food service in dietetics; formulation of innovative solutions and processes to enhance effectiveness in the work place.

NSCI 5213* Entrepreneurship in Food Service and Dietetics. Prerequisite(s): Admission to Great Plains IDEA online MS in Dietetics. An overview of entrepreneurship, characteristics of entrepreneurs and small business development within the context of food service and dietetics. Web-based instruction.

NSCI 5223* Advanced Nutrition Across the Life Span. Prerequisite(s): Admission to the Great Plains IDEA online MS in Dietetics. Examination of the influence of normal physiological stresses on nutritional needs throughout the life span. Web-based instruction.

NSCI 5240* Contemporary Issues in Nutrition. 3-9 credits, max 9. Prerequisite(s): Enrolled in Great Plains IDEA online MS in Dietetics. Contemporary issues in nutrition. Web-based instruction.

NSCI 5303* Human Nutrition and Metabolism I. Prerequisite(s): Introduction nutrition, organic chemistry, physiology or consent of instructor. Examining the chemical characteristics and functions of macronutrients; digestion, absorption, transport and metabolism of macronutrients; control of intermediary metabolism and metabolic pathways. No credit for students with degree credit in NSCI 4123.

NSCI 5313* Dietary and Herbal Supplements. Prerequisite(s): Human Physiology or consent of instructor. Explore the safety and efficacy of botanical/herbal and dietary supplements in health applications including dietary supplementation in the prevention and treatment of chronic disease. Web-based instruction.


NSCI 5333* Human Nutrition and Metabolism. Prerequisite(s): Intro nutrition, organic chemistry, biochemistry and physiology. Digestion, absorption and metabolism of nutrients; functions and health implications in the human organism.

NSCI 5353* Human Nutrition and Metabolism II. Prerequisite(s): Introductory nutrition, organic chemistry, biochemistry and physiology. Chemical characteristics, absorption, transport, functions, requirements and health implications of vitamins and minerals. Discussion of phytochemicals and supplements in relation to health maintenance and disease prevention. No credit for students with degree credit in NSCI 4143.

NSCI 5363* Maternal and Infant Nutrition. Prerequisite(s): 2114 or equivalent. Nutritional needs and dietary concerns during pregnancy, lactation and the first year of life. Implications for nutrition intervention, education and policy.

NSCI 5373* Childhood Nutrition. Prerequisite(s): 2114 or consent of instructor. Nutritional needs of children, preschool through grade 12. Dietary implications for child care programs, school food service and parent education.
NSCI 5393* Nutrition and Aging. Prerequisite(s): 2114 or equivalent. Nutritional needs, and dietary concerns of the elderly. Implications for food and nutrition programs, policies, research and education.

NSCI 5403* Contemporary Issues in Dietetics Practice. Prerequisite(s): Acceptance as a dietetic intern. Contemporary issues in the practice of dietetics; innovative solutions and processes to enhance effectiveness in the workplace.

NSCI 5412* Dietetic Internship Management Practicum. Prerequisite(s): Acceptance as a dietetic intern. Supervised learning experiences in approved food service management for the achievement of performance requirements for entry level dietitians. Graded on a pass/fail basis.

NSCI 5422* Dietetic Internship Clinical Practicum. Prerequisite(s): Acceptance as a dietetic intern. Supervised learning experiences in approved clinical settings for the achievement of performance requirements for entry level dietitians. Graded on a pass/fail basis.

NSCI 5423* Food Writing for Professionals. Prerequisite(s): Admission to Great Plains IDEA MS in Dietetics or consent of instructor. Writing skills needed by the food professional in order to communicate effectively in writing about food and food-related topics. Includes hands-on projects in research and writing for various audiences and types of publications. Web-based instruction.

NSCI 5432* Dietetic Internship Community Nutrition. Prerequisite(s): Acceptance as a dietetic intern. Supervised learning experiences in approved community nutrition settings for the achievement of performance requirements for entry level dietitians. Graded on a pass/fail basis.

NSCI 5453* Nutrition and Health Disparities. Prerequisite(s): Admission to Great Plains IDEA MS in Dietetics or consent of instructor. Examination of nutrition and health disparities in the U.S. Identification of sociocultural determinants of health and their influence on nutrition and health outcomes. Exploration of interprofessional strategies to reduce nutrition and health disparities. Web-based instruction.

NSCI 5473* Pediatric Clinical Nutrition. Prerequisite(s): Admission to Great Plains IDEA MS in Dietetics or consent of instructor. Examination of the physiological, biochemical and nutritional aspects of disease processes relevant to infants and children up to 18 years of age. Medical nutrition therapy for a variety of medical conditions found in this population including inborn errors of metabolism, food hypersensitivity, obesity and diseases of the major organ systems. Web-based instruction.

NSCI 5543* Obesity Across the Life Span. Prerequisite(s): Admission to Great Plains IDEA MS in Dietetics or consent of instructor. Obesity in the population from childhood to the adult age groups. Examination of the impact of obese conditions on disease development throughout the life span. Critical analysis of interventions used in the behavioral and clinical management of overweight and obese individuals in community and clinical settings. Web-based instruction.

NSCI 5553* Global Nutrition and Food Security. Advanced study of the magnitude, causes, and nature of hunger and under-nutrition in low income countries; emphasis on programs, policies and planning directed toward alleviating hunger and malnutrition.

NSCI 5563* Nutritional Assessment. Prerequisite(s): Lifespan nutrition, human nutrition and metabolism, or equivalent. Dietary, physical, and biochemical assessment techniques and their application to patient or client nutritional status assessment in health care systems.

NSCI 5613* Advanced Nutrition Education and Counseling. Prerequisite(s): Consent of instructor. Analysis of various learning and behavior change theories and application in nutrition education.

NSCI 5643* Advanced Medical Nutrition Therapy. Prerequisite(s): Admission to dietetic internship or consent of instructor. Physiological and metabolic bases for nutritional support in disease.

NSCI 5673* Human Resources. Prerequisite(s): Admission to Great Plains IDEA online MS in Dietetics or consent of instructor. Future role, focus, practices and governance of human resources in health care.

NSCI 5683* Fundamentals of Leadership in Dietetics. Prerequisite(s): Admission to Great Plains IDEA online MS in Dietetics or consent of instructor. Study of the key issues in the theory, research, and application of leadership within the context of dietetics practice. Includes defining leadership, understanding situational characteristics that facilitate/hinder effective leadership, understanding effective/dysfunctional leadership, and gaining greater insight into one’s own leadership style and functioning. Web-based instruction.

NSCI 5713* Advanced Community Nutrition. Prerequisite(s): 2114, 3223 and 4733 or equivalent or consent of instructor. Current issues in community nutrition with emphasis on program development and evaluation of community nutrition programs. Analysis of the impact of economic, political, legislative and cultural diversity factors in the field of community nutrition.

NSCI 5743* Advanced Laboratory Techniques in Nutritional Sciences. Prerequisite(s): A course in biochemistry and a course in statistics. An integrated lecture and laboratory course examining the basic theories and techniques used in experimental nutritional sciences. Application of a range of biochemical and molecular biological techniques as they are currently applied to modern biomedical research.

NSCI 5753* Health Care Administration. Prerequisite(s): Consent of instructor. Overview of U.S. and international health care systems. Administrative roles of health care professionals and how they affect patient health and health care delivery in various settings.

NSCI 5783* Food Technology. Prerequisite(s): Consent of instructor; graduate standing. Principles and pertinent issues in food technology, including concepts, experimental and product design, process development, evaluation, packaging and marketing. Web-based instruction.

NSCI 5843* Non-Thesis Creative Component. Prerequisite(s): Final semester and consent of instructor. A guided course serving as the final requirement for graduate students in NSCI’s Master of Science degree, non-thesis option. Not recommended for students interested in pursuing a PhD.

NSCI 5863* Sensory Evaluation of Food. Lab 2. Prerequisite(s): 4013 or consent of instructor. Basic principles of physiology and psychology as they pertain to sensory evaluation, importance of sensory evaluation to the food industry, organization and operation of a sensory program or facility, test strategies, design of experiments and testing instruments, discrimination testing, descriptive analysis, and affective testing.

NSCI 5870* Problems in Nutritional Sciences. 1-4 credits, max 6. Analysis of emerging problems and trends in nutritional sciences.

NSCI 5960* Master’s Seminar in Nutritional Sciences. 1 credit, max 2. Prerequisite(s): NSCI graduate students. Individual and group seminars on current issues and research in nutritional sciences.

NSCI 5963* Environmental Scanning and Analysis. Prerequisite(s): Admission to Great Plains IDEA online MS in Dietetics or consent of instructor. Discussion of changes in the economic, social, ethical, political, legal, technological, and ecological environments in which dietitians practice. Implications of these changes for education, practice and research within the field with particular emphasis on the healthcare industry. Web-based instruction.

NSCI 6000* Doctoral Dissertation. 1-12 credits, max 45. Prerequisite(s): Consent of major professor.

NSCI 6033* Physiochemicals. Prerequisite(s): Advanced human nutrition/metabolism or consent of instructor. Identification of basic structural, functional and metabolic properties of physiochemicals (substances in plants that have been linked to reducing chronic disease). Special attention placed on health benefits and chronic disease risk reduction.

NSCI 6223* Nutrition in Immunology. Prerequisite(s): 5043 or consent of instructor. Principles and issues related to nutrition and immunology. Impact of nutrients and nutritional status on the integrity of the immune system.

NSCI 6243* Nutrition and Cancer. Examination of basic cancer biology and methodology used to study nutrition and cancer relationships. The role of nutrition in specific cancers, cancer prevention and cancer treatment will be explored.

NSCI 6453* Advanced Research Methods in Nutritional Sciences. Components of the research process for students who have completed an advanced degree. Development, application and interpretation of research methodology.


NSCI 6870* Independent Study in Nutritional Sciences. 1-3 credits, max 6. In-depth analysis of research issues in nutritional sciences.

NSCI 6960* Seminar: Emerging Topics in Nutrition. 1 credit, max 4. Critical evaluation of research in nutritional sciences. Individual and group seminars on selected topics.

Occupational Education (OCED)

OCED 5000* Thesis or Report. 2-10 credits, max 10. Students studying for a master’s degree may enroll for a total of two credit hours if they write a report or six hours if they write a thesis. Students working on a specialist’s degree may earn a maximum of 10 hours credit.

OCED 5010* Seminar. 1-3 credits, max 6. Graduate student seminars focusing on current and critical issues and common problems relevant to occupational education.

OCED 5113* Principles of Leadership in Workforce Education. Principles and analysis of leadership in today’s workforce education organizations and the effect of leadership practices on organizational climate and governance. Understanding today’s labor market and the connection among education, government, and workforce development policy.

OCED 5123* Evaluation of Occupational and Workforce Education Programs and Instruction. Principles of evaluation applied to instructional programs in occupational and workforce education. Techniques and strategies for designing, conducting, reporting, and applying evaluations of programs in occupational/technical schools, government agencies, and public or private...
OCED 5133* Internationalism, Globalization and Occupational Education. Prerequisite(s): Graduate standing. Preparing a globally competitive workforce. Analysis of comparative international occupational/technical education systems, and critical issues in internationalism and globalization in workforce education development.

OCED 5433* History, Principles and Organization of Workforce Education. Prerequisite(s): Graduate standing. Understanding of the history, principles, and organization of workforce education. This course covers the development of workforce education programs, the factors that have shaped the field, and the current and future trends in workforce education.

OCED 5223* Program Planning for Occupational and Technical Educators. Approaches to program planning designed around continuous improvement methods for problem solving, flow charting, budgeting, gaining program support, and Lifelong Education Program Planning (LEEP) model.

OCED 5513* Curriculum Planning in Occupational Education. Principles and procedures for curriculum planning, development and management in occupational and adult education with analyses of current trends and practices and their implications for program quality.

OCED 5233* Advanced Instructional Procedures in Trade and Industrial Education. Advanced methods and procedures for effective teaching and learning in occupational education classrooms and laboratories. Teaching basic education and employment skills and the selection of job-related topics common to most occupational programs; procedures for incorporating those topics into the regular curriculum.

OCED 5533* Administration and Supervision of Workforce Education Programs. Understanding and critically analyzing the quality of workforce education programs and the values they hold.

OCED 5340* Special Problems in Occupational Education. 1-6 credits, max. 6. Prerequisite(s): Consent of instructor. Directed independent study of special topics involving assigned readings, library research, field work or a combination of these.

OCED 5423* Individualized Competency-Based Instruction and Customized Training. Principles, techniques, and technologies for creating and delivering individualized competency-based instruction and customized workplace training. Includes LAP systems and customizing for industry.

OCED 5443* Interpreting Research in Occupational Education. Seminar on the methods of research, review, synthesis and interpretation with application to particular fields of occupational and adult education.


OCED 5673* Principles and Practices of Distance Learning in Occupational Education. Prerequisite(s): Graduate standing. Issues, methods and tools of facilitating learning at a distance. Development of skills in designing and delivering instruction via current synchronous and asynchronous technologies such as video conferencing and Internet, fostering analysis of current research in distance learning, and encouraging real-world applications of acquired skills and knowledge.

OCED 5720* Workshop. 1-3 credits, max 10. Professional workshops of various topics and lengths. Each workshop designed to meet unique or special needs of individuals concerned with adult education and human resource development.

OCED 5880* Internship in Occupational Education. 3-6 credits, max 6. Prerequisite(s): Consent of instructor. Directed field experiences related to particular participants’ area of concentration. Practice and testing ideas, theories and concepts learned in graduate study.

OCED 5910* Developing and Analyzing Teaching Content. 1-3 credits, max 6. Provides opportunity for experienced teachers to incorporate the latest industrial technology into their course of study.

OCED 6000* Doctoral Dissertation. 1-25 credits, max 25. Required of all candidates for the Doctor of Philosophy degree. Credit is given upon completion of the dissertation.

OCED 6103* Philosophy of Occupational Education. Alternative perspectives for developing a philosophic position in occupational and adult education.

OCED 6110* Graduate Reading in Occupational Education. 1-6 credits, max 6. Prerequisite(s): Graduate standing and consent of supervising professor. Supervised readings of significant literature not included in regularly scheduled courses.

OCED 6113* Supervision of Workforce Education Instruction. Theoretical and practical application of current instructional supervision in a workforce education setting. Strategies for effective supervision are learned through practice in analyzing teacher instruction for provisional and standard certifications and for industry-certified instructors.

OCED 6233* Managing Knowledge in Learning Organizations. Analyze the knowledge management concepts of informal learning, communities of practice, knowledge/learning transfer, organizational learning, and knowledge creation in learning organizations and workplaces. Conduct self-directed research projects on course-related topics and develop a conceptual map of learning outcomes.

OCED 6333* Strategic Planning in Workplace Learning and Organizational Performance. Theory, trends, and competency model development performance areas.

OCED 6343* Financing Occupational Education. Prerequisite(s): Graduate standing. Development of conceptual and legal bases for funding public occupational education. Sources of funding, distribution strategies, local, state and federal accountability requirements, and fraud and abuse funds.


OCED 6871* Doctoral Seminar: Level 1. Orientation to doctoral program in OCED. May be taken prior to program application; required of all applicants.

OCED 6880* Doctoral Internship in Occupational Education. 1-8 credits, max 8. Prerequisite(s): Consent of instructor. Directed field experiences related to the participant’s area of concentration. Practice and testing ideas, theories and concepts learned in graduate study.


Petroleum Engineering (PETE)

PETE 4303 Petroleum Rock and Fluids. Prerequisite(s): GEOL 3413 or permission of instructor. Topics include rock properties, flow through porous media, principles of organic chemistry, properties of hydrocarbon liquids and gases; multicomponent mixtures, phase behavior, and gas-liquid equilibrium concepts. Previously offered as ENGR 4303.

PETE 4313 Drilling and Well Completions. Prerequisite(s): PETE 4303 or permission of instructor. Topics include drilling systems, drilling fluids, drilling hydraulics, cuttings transport, drill bits, oilfield pipe, cements and cementing operations, perforating, acidizing, hydraulic fracturing, and oilfield tools. Previously offered as ENGR 4313.

PETE 4333 Drilling and Well Completions. Prerequisite(s): PETE 4303 or permission of instructor. Topics include a review of artificial lift technologies, multi-phase flow, well stimulation, facilities engineering, gas treating, troubleshooting well production, advanced production strategies, industrial special topics and production equipment selection. Previously offered as ENGR 4333.

PETE 4343 Drilling and Well Completions. Prerequisite(s): PETE 4303 or permission of instructor. Topics include reservoir fluid flow, well performance, gas lifting, water coning, water influx, oil recovery mechanisms, oil and gas reservoirs, water flooding, type curve matching, well testing, and buildup and drawdown tests. Previously offered as ENGR 4343.

PETE 5303* Petroleum Geomechanics. Prerequisite(s): PETE 4303 or consent of instructor. Fundamentals of deformation and failure of sedimentary rocks; application of geomechanics in wellbore stability, solids productions, hydraulic fracturing and reservoir geomechanics.

PETE 5313* Advanced Drilling Modeling and Simulation. Prerequisite(s): PETE 4313 or consent of instructor. Advanced coverage of petroleum drilling operations with an emphasis on real-time drilling optimization; rate of penetration (ROP) modeling and simulation; drilling hydraulics with fluid design optimization; use of a simulator to predict ROP for different drills bits through different formations. Previously offered as ENGR 5323.

PETE 5333* Advanced Production and Flow Assurance. Prerequisite(s): PETE 4333 or consent of instructor. This course covers petroleum production systems and methods used to assure flow through the system. Topics include downhole and surface equipment, transport through pipelines, inflow performance, phase behavior in oilfield equipment, downhole and surface separation, field treating of natural gas, and production enhancement.

PETE 5343* Advanced Reservoir Engineering. Prerequisite(s): PETE 4343 or consent of instructor. Topics include reservoir drive mechanisms, material balance approach to predict oil and gas reservoir properties, fluid flow in porous media, principles of secondary and tertiary recovery methods, analytical and numerical solutions for fluid flow in reservoirs, and well test analysis.

PETE 5363* Petroleum Economics and Investments. Prerequisite(s): PETE 5303 and PETE 5343) or consent of instructor. Evaluation techniques for oil and gas properties focusing on economic analyses, reserves classifications and decision making. Previously offered as ENGR 5363.

PETE 5373* Advanced Well Stimulation. Prerequisite(s): Consent of instructor. Hydraulic fracturing simulation and design. Unconventional resource
Philosophy (PHIL)

PHIL 1113 (H) Introduction to Philosophy. Selected philosophical problems: the nature of reality, knowledge, value, social ideals and religion.

PHIL 1213 (H) Philosophies of Life. Introduction to selected views of living a meaningful life in light of morality, social values, truth and freedom.

PHIL 1312 (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.

PHIL 2013 (H) Philosophical Classics. Basic works by great thinkers, including Plato, Descartes and Hume.

PHIL 2513 (H) Philosophy and Culture. A philosophical investigation of diverse cultural attitudes, values, and experiences. Representative topics include social media, entertainment, music, film, art, tradition, ritual, gender, race, class, and religion.

PHIL 3003 (A) Symbolic Logic. Propositional logic and predicate logic with identity. Formal analysis of language.

PHIL 3113 (H) Ancient Greek Philosophy. Prerequisite(s): PHIL 1113, PHIL 1313 or PHIL 2013, or any 3000-4000 level PHIL course. Historically-based introduction to the philosophical ideas and works of Plato and Aristotle. Begin by reading excerpts and commentary on the Pre-Socratics and Sophists. End the course with readings from the Hellenistic schools of philosophy: Stoics, Skeptics, and Epicureans.

PHIL 3213 (H) 17th and 18th Century Philosophy. Prerequisite(s): PHIL 1113 or PHIL 1313 or PHIL 2013, or any 3000-4000 level PHIL course. Major philosophers and problems in Western thought from the 17th through the 18th century. Emphasis on Descartes, Hume and Kant.

PHIL 3313 (H) 19th and 20th Century Philosophy. Prerequisite(s): PHIL 3213 or consent of instructor. Major philosophers and problems in Western thought from Hegel to the present.

PHIL 3413 (H) Ethical Theory. Contemporary and classical views on the nature of moral judgments, moral value, relativity and objectivity, freedom and responsibility.


PHIL 3523 (H) Medieval Philosophy. The central focus is on the philosophical and theological problems that engaged the minds of medieval thinkers from Christian, Islamic, and Jewish traditions, including Abelard, Avicenna, Averroes, Maimonides, Aquinas, Scotus, and Ockham.


PHIL 3623 (DH) Philosophy of Race. Philosophy of Race investigates race discourse within the texts of contemporary philosophers. The course begins with an examination of the concept of race from antiquity through postmodernism. Course discussion focuses on the biological validity of race, the rise of race as a sociopolitical concept, and the role of modern philosophers in shaping the prevailing perception of people of non-European descent in the West and the implicit justification of slavery, which pervades their texts.

PHIL 3723 (H) Philosophy of Film. Philosophy of Film uses films and some literature as tools to investigate standard philosophical issues such as: a) current ethical and political topics; b) Epistemology; c) Metaphysics; d) Social and Political Philosophy; e) Philosophy of Science; f) Philosophy of Race & Gender; and g) Philosophy of Mind. The primary focus is the use of various media (primarily film) as a way to introduce and explore philosophical issues. Different instructors may emphasize different films and/or philosophical topics.

PHIL 3743 (H) Patterns in Science: Historical and Value Dimensions of Western Science. A general introduction to the history of western science, stressing cultural values affecting scientific innovations, as well as the affects of scientific innovations on cultural values. Important examples from the history of astronomy and physics and from the history of evolutionary biology will be examined. Students will critically examine the relationship(s) between scientific work and broader cultural concerns.

PHIL 3803 (H) Business Ethics. Ethical issues in business, such as employer-employee duties and loyalties, advertising purposes, preferential treatment practices. Analytic grounding in basic theories of ethics.

PHIL 3813 (H) Recent American Philosophy. Dominant trends in American philosophy during the last 100 years, with emphasis on pragmatism.

PHIL 3833 (H) Biomedical Ethics. Moral problems brought about by recent developments in scientific research and medical technology. Abortion, euthanasia, genetic engineering, and human experimentation.

PHIL 3843 (H) Philosophy of Law. Prerequisite(s): Upper-division standing. Philosophical issues related to U.S. law. The relationship between law and morality, the nature and functions of law and grounds of liability.

PHIL 3913 (H) Existentialism. Prerequisite(s): three credit hours of philosophy. 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.

PHIL 3920 Contemporary Philosophical Problems. 3 credits, max 9. Selected contemporary problems and discussions.

PHIL 3933 (H) Creation and Evolution. Critical examination of claims that various Creationist/Intelligent Design models offer better scientific explanations for selected biological phenomena than does the current dominant view of Darwinian evolution.

PHIL 3943 (H) Asian Philosophy. Three main streams of Asian thought: Indian, Chinese and Buddhist. How various thinkers in the three traditions have dealt with questions of being and becoming, knowledge, ethics, and society.

PHIL 4003* Mathematical Logic and Computability. Prerequisite(s): PHIL 3003 or MATH 3613 or consent of instructor. The basic metatheorems of first order logic: soundness, completeness, compactness, Löwenheim-Skolem theorem, undecidability of first order logic, Gödel's incompleteness theorem. Enumerability, diagonalization, formal systems, standard and nonstandard models, Gödel numberings, Turing machines, recursive functions, and evidence for Church's thesis. (Same course as MATH 4003)

PHIL 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.

PHIL 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.

PHIL 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.

PHIL 4453 (H) Philosophy in Literature. Selected literary works examined for philosophical ideas and themes. Attention to the interrelation of form and content. Thematic approach.

PHIL 4543* Philosophy of Language. Prerequisite(s): 1313 or 3003. A survey of the development of the philosophy of language, including works of philosophers such as Frege, Wittgenstein, Russell, Strawson, Searle, Donnellan, Grice, and Kripke.

PHIL 4553* Contemporary Ethical Theory. Prerequisite(s): PHIL 3413 or consent of instructor. Debate in ethical theory since Moore. The naturalistic fallacy, intuitionism, and value realism.

PHIL 4713 (H) Philosophy of Science. Philosophical issues related to science and its role in society. Topics include science and common sense, laws and theories, causality, nature of scientific progress.

PHIL 4733 (H) Philosophy of Biology. Selected philosophical topics, such as Darwinism and other theories of evolution, physical reductionism, and issues of genetic engineering.

PHIL 4943* Indian Philosophy. Prerequisite(s): 3943 or consent of instructor. Study of texts and themes in two main traditions of Indian Philosophy: Hinudism and Buddhism. How these schools present the fundamental nature and knowledge of reality, human existence, the divine, and enlightenment.

PHIL 4953* East Asian Philosophy. Prerequisite(s): 3943 or consent of instructor. Study of texts and themes in the Chinese and Japanese traditions: Confucianism, Daoism and Zen. How these schools present the fundamental nature and knowledge of reality, human existence, community and environment.

PHIL 4983* Metaphysics and Epistemology. Prerequisite(s): 12 credit hours of philosophy. The study of the fundamental nature of reality and human knowledge of it.
PHIL 4990 Special Studies in Philosophy. 1-3 credits, max 10. Selected philosophical topics or works.

PHIL 4991* Contemporary Philosophy Research. Prerequisite(s): Upper-division standing, at least 12 hours in philosophy completed. Study of leading edge research in philosophy through presentation and discussion of current philosophy journal articles with faculty.

PHIL 4993 Senior Honors Thesis. Prerequisite(s): 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 philosophy.

PHIL 5000* Master's Thesis in Philosophy. 1-6 credits, max 6. Supervised individual work on a thesis for a master's degree.

PHIL 5203* Proseminar. Introduction to professional oral and written communication in philosophy.

PHIL 5210* Seminar on a Major Philosopher. 3 credits, max 9. Prerequisite(s): Three courses in philosophy. The writings of a major philosopher and related material.

PHIL 5303* Topics in Philosophy of Religion. An examination of central topics in the philosophy of religion, such as the existence of God, the problem of evil, divine attributes, miracles, revelation, faith and reason, religious pluralism and exclusivism, and morality.

PHIL 5310* Seminar on a Field of Philosophy. 3 credits, max 9. Prerequisite(s): Three courses in philosophy. Selected topics in one field of philosophy.

PHIL 5313* Topics in Social Political Thought. Consideration of a single topic (e.g. justice), topics (e.g. distributive justice and citizenship) of a single philosophical school, or movement (e.g. Marxism) or several movements and schools (e.g. Marxism and liberalism).

PHIL 5323* Seminar in Ancient Philosophy. Prerequisite(s): 3113. Philosophical problems that characterize ancient Philosophy: form and matter, one and many, universal and particular, actuality and potentiality, stability and change, substance and accidents, first principles and elements. Close reading of Plato and Aristotle.

PHIL 5333* Seminar in Modern Philosophy. Prerequisite(s): 3213 or 3313. Examination of the metaphysical and epistemological systems of philosophers over 17th-19th century Europe such as Descartes, Spinoza, Locke, Leibniz, Berkeley, Hume, Kant and Hegel.

PHIL 5343* Seminar in East and West Comparative Philosophy. Prerequisite(s): 3943. Critical comparison between West European and East Asian traditions of philosophy, such as being and non-being, the nature of truth, self, human being, ethics, human rights, community, and religion.

PHIL 5353* Seminar in Contemporary Continental Philosophy. Prerequisite(s): 3213 or 3313. Themes such as presence and absence, intentionality and constitution, meaning and "being," identity and difference, history and consciousness, taste and freedom, construction and deconstruction. Philosophers such as Merleau-Ponty, Husserl, Heidegger, Sartre, Derrida, and Faucault.

PHIL 5363* Topics in Metaphysics. Prerequisite(s): 3113 or 3213 or 4983. Selected topics that may be approached from an historical or contemporary standpoint, such as idealism, realism, causation, time, universals, personal identity, possibility and necessity, and free will.

PHIL 5373* Contemporary Epistemology. Prerequisite(s): 3213 or 3113 or 4983. Recent approaches to the theory of knowledge. Origin and justification of belief and certainty, roles of the senses and the mind, and the nature of truth.

PHIL 5383* Seminar in American Philosophy. Selected philosophical schools or traditions influential in American thought, such as transcendentalism, pragmatism, or naturalism.

PHIL 5393* German Idealism. Prerequisite(s): 3113 or 3213. Selected major works of post-Kantian German Philosophy, such as the nature of a philosophical system, identity, and self-consciousness.

PHIL 5423* Topics in Ethical Theory. Prerequisite(s): 3413. Central problems in ethical theory, such as ethical realism/anti-realism, motivational internalism/externalism, and problems within specific normative systems.

PHIL 5433* Topics in Philosophy of Law. Prerequisite(s): 3843. In-depth examination of selected topics in philosophy of law, such as punishment, jurisprudence, and principles of legislation. Seminar format.

PHIL 5443* Topics in Biomedical Ethics. Prerequisite(s): 3833. In-depth examination of selected topics in biomedical ethics, such as implications of the Human Genome Project, ethics of human reproduction, and research ethics. Emphasis on contemporary philosophical thought. Seminar format.

PHIL 5510* Research Topics in Philosophy. 1-3 credits, max 10. Prerequisite(s): Consent of graduate adviser or department head. Individual research on topics related to the student's interests and/or Thesis topic(s).

PHIL 5610* Philosophical Issues in Education. 2-3 credits, max 3. Contemporary issues in educational theory and practice. The relation of education to political thought, religion, public law and culture.

PHIL 5910* Research Problems in Philosophy. 1-3 credits, max 10. Prerequisite(s): Consent of instructor and department head. Individual or group research on specific philosophical problems.

Physics (PHYS)

PHYS 1001 Frontiers of Physics. Student and faculty discussions of current research topics in physics as presented in popular journals. Graded on pass-fail basis.

PHYS 1014 (N) Descriptive Physics. A survey course presenting the basic concepts and principles of physics with a minimum of mathematics. Motion, waves, electricity, magnetism, optics, atomic structure, and nuclear energy.

PHYS 1114 (L,N) General Physics. Prerequisite(s): MATH 1513 or higher with a grade of "C" or better, or an acceptable placement score (see placement.okstate.edu). Algebra-based introductory course covering the basic concepts of physics appropriate for a range of science and preprofessional majors. Practical examples of the role of physics in other disciplines. Newtonian mechanics, fluids, heat, thermodynamics, waves, sound.

PHYS 1214 (L,N) General Physics. Lab 2. Prerequisite(s): 1114 or 2014 with a "C" or better. Continuation of 1114. Electricity, magnetism, optics, quantum physics, atomic and nuclear structure.

PHYS 1313 Inquiry-Based Physics. Lab 3. Properties of matter, motion, light and color, electrical circuits and energy conservation. Recommended for elementary education majors as model course to learn and teach science.

PHYS 2014 (L,N) General Physics. Lab 2. Prerequisite(s): MATH 2144 with a grade of "C" or higher. Calculus-based introductory course for science, math and engineering majors. Mechanics, waves, heat, and thermodynamics.

PHYS 2020 Special Topics in Physics. Topics of current interest in physics appropriate for the lower-division level, such as the role of physics in modern society.

PHYS 2114 (L,N) General Physics. Lab 2. Prerequisite(s): 2014 or 2314 with a "C" or better. Continuation of 2114. Electricity, magnetism, and optics.


PHYS 2414 (L,N) General Physics for Science Majors II. Lab 2. Prerequisite(s): 2014 or 2314. Continuation of 2314. Electrostatics, electric fields and currents, circuits, waves, physical optics, modern physics, nuclear physics, and thermodynamics.

PHYS 3013* Mechanics I. Prerequisite(s): 2114 or equivalent, and MATH 2233 or concurrent enrollment. Mechanics of particles, systems of particles and rigid bodies.

PHYS 3113* Heat. Prerequisite(s): 2114 or equivalent and MATH 2163 or concurrent enrollment. Thermometry, heat transfer, elementary theory of specific heat and the three laws of thermodynamics.

PHYS 3213* Optics. Prerequisite(s): 2114 or 2414 and 3513, or consent of the instructor. Geometrical optics; interference, diffraction, dispersion, absorption, and polarization of light.

PHYS 3313 Introduction to Semiconductor Device Physics. Prerequisite(s): 2114 or equivalent. An introduction to crystal structure, the quantum theory of solids, the physics of semiconductor materials and the pn junction, with an emphasis on applications to semiconductor devices. (Same course as ECEN 3903)

PHYS 3323 Modern Laboratory Methods I. Lab 6. Prerequisite(s): 2014, 2114. Introduction to electric and electronic measurements and computer applications in experimental control, data collection and laboratory computation. Experiments on test instruments, integrated electronics, signal processing, computer interfacing, and data acquisition.

PHYS 3513* Mathematical Physics. Prerequisite(s): 1214, 2114 or 2414 and MATH 2163. Physical applications of vectors, vector calculus and differential equations. Fourier analysis. Orbit geometry, coordinate systems and transformation of coordinates. Matrices and determinants.

PHYS 3623 Modern Laboratory Methods II. Lab 6. Prerequisite(s): 2014, 2114 or equivalent. Introduction to the operating principles and applications of modern physical methods used in research. Laboratory experiments with lasers, wave propagation, thermometry, radiation detection, optical interferometry, and spectroscopy.

PHYS 3713 Modern Physics I. Prerequisite(s): 2114. Atomic physics, special theory of relativity, and introduction to solid state and nuclear physics.

PHYS 4003* Computer Simulation Methods in Physics. Prerequisite(s): 3013, 3113, 3313 or consent of instructor. Introduction to computer simulation methods used in the physical sciences. Linear systems, nonlinear systems, molecular dynamics, Monte Carlo methods, cellular automata, simple quantum systems. Some knowledge of either C, FORTRAN, Pascal, or BASIC required.

PHYS 4010* Special Problems. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Individual laboratory work of an advanced nature.
PHYS 4113∗ Electricity and Magnetism. Prerequisite(s): 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.

PHYS 4213∗ Introduction to Nuclear and Particle Physics. Prerequisite(s): 2114 and 3713 or consent of instructor. Survey of phenomenological aspects of nuclear and particle physics, photon and charged particle interactions with matter, particle detectors, particle accelerators, electromagnetic, strong and weak interactions, models of the nucleus, quark model of mesons and baryons, symmetry properties, and symmetries in the Standard Model.

PHYS 4263 Introduction to Solid State Physics. Prerequisite(s): 3013, 3713 or consent of instructor. Structure, specific heat, dielectric properties, lattice vibrations, free electron theory, band structure, and superconductivity of solids.

PHYS 4313∗ Molecular Biophysics. Prerequisite(s): 1214 or 2114. Survey of experimental and computational methods for determining the structure and function of biomolecular assemblies such as proteins and membranes. Techniques to be discussed include: X-ray diffraction, nuclear and electron spin resonance, optical spectroscopy, photobiophysics, kinetic modeling, molecular dynamics, Monte Carlo and homology modeling.

PHYS 4413∗ Modern Physics II. Prerequisite(s): 3013 and 3713. Atomic and X-ray spectra, one-dimensional Schrödinger equation; nuclear structure; introduction to statistical mechanics and elementary quantum statistics.

PHYS 4423∗ Mechanics II. Prerequisite(s): 3013. Lagrangian and Hamiltonian dynamics, calculus of variations, constrained systems, coupled oscillators, continuous systems and waves.

PHYS 4513∗ Introductory Quantum Mechanics. Prerequisite(s): 3713. Uncertainty principle, setting up Schrödinger equation (time dependent as well as time independent) and solving it for linear oscillator, hydrogen atom, periodic and other potentials.

PHYS 4663∗ Radioactivity and Nuclear Physics. Prerequisite(s): 3713 or consent of instructor. Natural and artificial radioactivity, decay laws; absorption, detection and measurement of radiations; nuclear transformations.

PHYS 4712∗ Senior Project. Lab 6. Advanced individual experimental projects. Project proposal, formal laboratory report, and oral presentation are required.

PHYS 4813∗ Electromagnetic Radiation. Prerequisite(s): 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.

PHYS 4993 Senior Honors Thesis. Prerequisite(s): 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.

PHYS 5000∗ Master’s Thesis Research or Report. 1-9 credits, max 9. Prerequisite(s): Consent of major professor. Thesis research or report for master’s degree.

PHYS 5110∗ Seminar. 1-5 credits, max 20. Prerequisite(s): Graduate standing in physics. Special topics in physics.


PHYS 5123∗ Geometrical Optics. Prerequisite(s): 3213 or consent of instructor. Foundations of geometrical optics, geometrical theory of optical imaging, geometrical theory of aberrations, image forming instruments. (Same course as ECE 5580)

PHYS 5133∗ Laser Spectroscopy. Prerequisite(s): 5163. Principles of different types of laser spectroscopy based on fluorescence, absorption, saturated absorption, absorption in a cavity: Infrared, Raman, light scattering, four wave mixing, CARS, phase conjugation, two photon absorption, double resonance, and multiphoton ionization.

PHYS 5163∗ Lasers. Prerequisite(s): 4813 or equivalent. Semi-classical description of absorption and emission of light by matter; effects of cavities and optical elements; theory of lasers—gas, liquid, solid state and semiconductor.

PHYS 5213∗ Statistical Mechanics. Prerequisite(s): 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.

PHYS 5220∗ Physics Topics for Teachers. 1-6 credits, max 6. Prerequisite(s): Teaching experience or consent of instructor. Special topics for elementary and secondary science teachers to improve their subject matter competence. Content varies, depending on the needs of specific groups of teachers.

PHYS 5263∗ Particle Physics. Prerequisite(s): 5613 or consent of instructor. Phenomenology of elementary particles: quark model, electromagnetic, weak, and strong interactions of quarks, leptons, and gauge bosons, Feynman diagram techniques, parton model, gauge symmetries, spontaneous symmetry breaking, Standard model, experimental tests.

PHYS 5303∗ Physical Optics. Prerequisite(s): 3213 or consent of instructor. Multiple beam interference, diffractions, imaging, near field optical probes of matter, surface plasmons, light scattering from random media, optical coherence tomography - biomedical applications, negative materials, perfect lenses and super resolution. (Same course as ECE 5823∗)

PHYS 5313∗ Electromagnetic Theory. Prerequisite(s): 5453. Electric and magnetic fields in free space and in matter. Boundary value problems, Green’s functions, stress tensors, multipole expansions, thermodynamics, electromagnetic waves.

PHYS 5350∗ Special Problems. 1-3 credits, max 3. Prerequisite(s): Graduate standing in physics. Special problems of experimental or theoretical nature. Large individual work with written report required.

PHYS 5413∗ Classical Mechanics. Prerequisite(s): 4423 or consent of instructor. Generalized coordinates and advanced dynamics; coupled systems, wave motion; theory of elasticity.

PHYS 5453∗ Methods of Theoretical Physics. Prerequisite(s): 3513. Introduction to the various methods used in theoretical physics.

PHYS 5523∗ Radiation Detection and Measurement. Prerequisite(s): 3713 or 4212. Overview of radiation detection and measurement. Instrumentation, statistics of radiation measurements, review of atomic and nuclear physics, review of radiation interaction with matter, nuclear electronics, gas-filled and scintillation detectors, semiconductor detectors, radiation counting and spectroscopy.

PHYS 5533∗ Dosimetry and Radiation Protection. Prerequisite(s): 4663 and 5523 or consent of instructor. Dosimetry Quantities, effects of ionizing radiation on the human body, basic radiation protection concepts, x-ray and y-ray interaction with matter, charged particle and neutron interaction with matter, charged particle equilibria, Bragg-Gray Cavity Theory, quantifying dose from radionuclide sources, review of dosimetric instrumentation, dosimetry with ionization chambers, integrating dosimeters and personal dosimetry.

PHYS 5563∗ Radioactivity and Nuclear Physics Laboratory. Lab 4 Prerequisite(s): 4663 and 5523 or consent of instructor. The primary objective of this course is to provide students with hands-on experience in a range of experimental techniques and with a variety of instrumentation routinely used in radiation detection and dosimetry, nuclear and particle physics, and in radiotherapy and medical imaging. The course content can be thought of as being of two types: 1) general experimental methods in physics and 2) methods of radiation detection and measurement.

PHYS 5573∗ Radiation Biophysics. Prerequisite(s): 5533 or consent of instructor. Introduction to radiation biophysics, structure of DNA and its relationship to carcinogenesis, stochastic nature or radiation interaction with matter, radiation chemistry, cell survival curves, radiation damage models, DNA damage response.

PHYS 5583∗ Physics of Medical Imaging. Prerequisite(s): 4663 and 5523 or consent of instructor. Review of radiation interaction with matter, x-ray imaging, Magnetic Resonance Imaging, Ultrasound, Scintillation Imaging. Single photon emission computed tomography (SPECT), Positron Emission Tomography (PET).

PHYS 5593 Physics of Radiation Therapy. Prerequisite(s): 5533 or consent of instructor. Overview of Radiation Therapy, dosimetry in radiation therapy, megavoltage x-ray and electron therapy, manual treatment planning, computer-based treatment planning, brachytherapy, proton therapy.

PHYS 5613∗ Quantum Mechanics I. Prerequisite(s): 5453. Postulates of quantum mechanics. Operators, commutation relations, eigenfunctions, Schroedinger, Heisenberg and interaction formalisms, angular momentum and coordinate field problems: nonrelativistic perturbation theory.

PHYS 5663∗ Solid State Physics I. Prerequisite(s): 4513. 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.

PHYS 5693∗ Clinical Studies in Medical Physics. Prerequisite(s): 5583, 5593 and consent of instructor. Students will perform a clinical rotation within a hospital-based radiation therapy treatment clinic, during which they will shadow a medical physicist and observe and participate in (when appropriate) the physicists daily clinical activities. The student will learn the technical aspects of CT and MR imaging, radiotherapy treatment planning and delivery, and routine and patient specific calibration/quality assurance procedures.

PHYS 5713∗ Solid State Physics II. Prerequisite(s): 5663 or equivalent. Symmetry, dielectric properties, ferroelectrics, magnetic properties, mechanical properties, and defects of solids.

PHYS 5813∗ General Relativity. Prerequisite(s): 5453 or consent of instructor. Theory and applications of general relativity: the principle of equivalence, general coordinate invariance, tensors, affine connections, Einstein’s field equations, classic tests, application to stellar dynamics, black holes, and cosmology.

PHYS 5960∗ Problems in Chemical Physics. 3-6 credits, max 6. Prerequisite(s): Consent of instructor. Intermolecular forces, interaction of
PHYS 6000* Doctoral Dissertation Research. 1-15 credits, max 60. Prerequisite(s): Admission to candidacy and permission of major professor. 

PHYS 6010* Advanced Graduate Seminar. 1-3 credits, max 15. Prerequisite(s): Consent of instructor. Special topics of an advanced nature in physics. 

PHYS 623E* Advanced Theory of Solids. Prerequisite(s): 5663. Many-body techniques, transport processes, band theoretical techniques, superconductivity, dynamics of electrons in a magnetic field, and alloys. 


PHYS 6243* Semiconductors I. Prerequisite(s): 5113, 5613, 5663. The first part of a survey of the physics of semi-conductors. Bonding and structure, crystal growth (both bulk and thin film), band structure, defects, intrinsic and extrinsic semiconductors, band structure, defects, Fermi level, bandgap, and band structure. 

PHYS 6260* Special Topics in High Energy Physics. 1-3 credits, max 9. Prerequisite(s): 5263 or consent of instructor. Topics of current interest in high-energy physics: collider physics, supersymmetry, unification, flavor physics, string phenomenology, extra dimensions. 

PHYS 6313* Quantum Mechanics II. Prerequisite(s): 5613. Scattering theory, many-particle quantum mechanics and application to atomic and molecular systems; degenerate and time-dependent perturbation theory. 

PHYS 6323* Quantum Field Theory. Prerequisite(s): 6313 or consent of instructor. Relativistic Quantum Mechanics: Klein-Gordon field, integral formalism, Feynman diagrams, Quantum Electrodynamics, relativistic scattering radiative corrections, renormalization and critical exponents, non-Abelian gauge theories, spontaneous symmetry breaking. 

PHYS 6343* Semiconductors II. Prerequisite(s): 6243. Second part of the semiconductors course. Transport phenomena, junctions, devices, heterostructures, and optical properties. 

PHYS 6413* Nonlinear Optics. Prerequisite(s): 5613 and 5631. The response of matter at high radiation powers; nonlinear susceptibilities. Wave propagation in nonlinear medium; three wave and four wave interactions; saturation, absorption, switching and limiting; two photon and stimulated Raman processes; Self focussing; solitons. 

PHYS 6423* Quantum Optics. Prerequisite(s): 5163 and 5613 or consent of instructor. Quantization of Electromagnetic Fields, coherence, quantum entanglement, parametric down conversion, two photon interferometry, Bell's inequalities, quantum teleportation and cryptography, cavity QED. 

PHYS 6513* Advanced Topics in Solid State Physics. Prerequisite(s): 5663 or equivalent. Interaction of radiation and matter, neutron scattering, phase transitions, magnetic resonance and cooperative phenomena. 

PHYS 6613* Advanced Nuclear and Particle Physics. Prerequisite(s): 5263, 5613; or consent of instructor. Renormalization of quantum field theories, spontaneous symmetry breaking, Standard model, flavor physics, grand unification, supersymmetry, and superstrings. 

PHYS 6713* Advanced Electromagnetic Radiation. Prerequisite(s): Consent of instructor. Radiation theory, wave guides, scattering and dispersion relations; relativity. 

PHYS 6803* Photonics I: Advanced Optics. Lab 9. Prerequisite(s): ECEN 3213 or 3813. Advanced optics including spectral and time characteristics of detectors, characteristics of lasers, time, spectral and spatial parameters of laser emission, interferometric techniques, and nonlinear effects such as two-photon absorption and second and third harmonic generations. Ultrafast laser pulses. (Same course as CHEM 6803 & ECEN 6803) 

PHYS 6810* Photonics II: THz Photonics and THz-TDS. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. THz photonics and THz-time-domain spectroscopy (THz-TDS). Concepts and techniques of driving electronic circuitry with ultrashort laser pulses to generate and detect freely propagating pulses of THz electromagnetic radiation using several operational research systems. (Same course as CHEM 6810* & ECEN 6810) 

PHYS 6820* Photonics II: Spectroscopy II. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Operating principles and applications of laser spectroscopy of atoms, molecules, solids and complex fluids. Absorption, emission, photon correlation, coherence, time resolved Fourier transform, Raman scattering and non-linear optical. (Same course as CHEM 6820 & ECEN 6820) 

PHYS 6830* Photonics II: Spectroscopy III. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Advanced spectroscopic instruments and methods used for investigation of semi-conductors and solid state material. Stimulated emission characteristics in wavelength and in time. Time-resolved fluorescence measurements. Multiphoton excitation. Fast measuring techniques including subnanosecond detectors, picosecond streak cameras, and ultrafast four-wave mixing and correlation techniques. Time-dependent photoconductivity measurements. (Same course as CHEM 6830 & ECEN 6830) 

PHYS 6840* Photonics III: Microscopy I. 1 credit, max 4, Lab 1. Prerequisite(s): CHEM 3553 or consent of instructor. The structure and imaging of solid surfaces. Basics of scanning probe microscopy (SPM). Contact and non-contact atomic force microscopy (AFM). Scanning tunneling microscopy (STM) in air. (Same course as CHEM 6840* & ECEN 6840) 

PHYS 6850* Photonics III: Microscopy II. 1 credit, max 4, Lab 1. Prerequisite(s): CHEM 6840 or consent of instructor. Advanced techniques of scanning probe microscopy (SPM). Magnetic force microscopy, Kelvin force microscopy, scanning, tunneling microscopy (STM) in vacuum. Characterization of materials with SPM. Nanolithography with SPM. Device manufacturing and analysis. (Same course as CHEM 6850* & ECEN 6850) 

PHYS 6860* Photonics III: Microscopy III and Image Processing. 1 credit, max 4, Lab 1. Prerequisite(s): ECEN 5793. Digital image processing, including projects. Image acquisition and display, image enhancement, geometric operations, linear and nonlinear filtering, image restoration, edge detection, image analysis, morphology, segmentation, recognition, and coding and compression. (Same course as CHEM 6860* & ECEN 6860) 

PHYS 6870* Photonics IV: Synthesis and Devices I. 1 credit, max 4, Lab 1. Prerequisite(s): 6803 and 6840. Preparation of functional nanostructures and related optical and electronic devices. Physical and chemical methods of thin film deposition. Engineering of prototypes of light emitting diodes, sensors, optimal limiting coatings, lithographic patterns. (Same course as CHEM 6870* & ECEN 6870*) 

PHYS 6880* Photonics IV: Semiconductor Devices, Testing and Characterization. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Test and characterization of semiconductor and optoelectronic devices. Hall effect, four point probes, CV and IV measurements, optical pump-probe, photoluminescence, and electro-optics sampling. (Same course as CHEM 6880* & ECEN 6880) 

PHYS 6980* Photonics IV: Semiconductor Synthesis and Devices III. 1 credit, max 4, Lab 1. Prerequisite(s): 6803. Processing, fabrication and characterization of semiconductor optoelectronic devices in class 100/10000 cleanrooms. Cleanroom operation including general procedures for material processing and device fabrication. Device processing using a variety of processing such as laser alignment, vacuum evaporators and rapid thermal annealer. Testing using optical and electrical testing apparatus such as l-V, C-V Hall, and optical spectral measurement systems. (Same course as CHEM 6980* & ECEN 6980) 

Plant Pathology (PLP)

PLP 2143 Global Issues in Agricultural Biosecurity and Forensics. Biosecurity, biosafety, bioterrorism, microbial forensics, emerging organisms, invasive species, quarantine, response, surveillance, detection, diagnostics, and how all system components integrate to science and to agricultural specialties, economics and defense. (Same course as ENTO 2143) 

PLP 3343 Principles of Plant Pathology. Lab 2. Prerequisite(s): BOT 1404 or BOT 3463 or MCR 2125 or PLNT 3013. Introduction to basic principles and concepts of plant pathology, including the nature, cause and control of bio and environmentally induced plant diseases, with emphasis on principles and methods of disease management. Offered in combination with PLP 5343. No credit for both 3343 and 5343. 

PLP 3553 Fungi: Myths and More. Lab 1. Prerequisite(s): BIOL 1114. Explores the impact of fungi on beliefs, culture and society via the colorful folklore and myths of fungi and their role in the environment and human affairs, including diversity of plants, animals and humans exemplified by the Great Bengal famine of 1943. The Irish potato famine, 1840's and the Salem witch trials 1692. Laboratory instruction on use of microscopes, mushroom identification, mechanisms of dispersal, and genetic recombination. (Same course as BOT 3563) 

PLP 3663 Turfgrass Integrated Pest Management. Lab 2. Prerequisite(s): 3343, ENTO 2993. The biology, ecology and identification of fungal, nematode and insect turfgrass pests. Contemporary concepts and applications of integrated control practices available for managing turfgrass pests presented along with decision-making tools for use in turfgrass pest management programs. (Same course as ENTO 3663) 

PLP 4400 Special Topics. 1-3 credits, max 3. Prerequisite(s): Consent of instructor. Special topics in Plant Pathology, Entomology or related fields. (Same course as ENTO 4400) 

PLP 4923* Applications of Biotechnology in Pest Management. Prerequisite(s): BIOL 1114 and CHEM 1215 or equivalent. Applications of biotechnology in controlling arthropod pests of plants and animals, plant pathogens, and weeds. Introduction to underlying technology, products being developed and deployed, their effectiveness and associated problems or concerns resulting from their use. (Same course as ENTO 4923 and PLP 4923) 

PLP 5000* Research, 1-6 credits, max 6. Research for the MS degree. 

PLP 5003* Plant Nematology. Lab 2. Prerequisite(s): 3343 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. 

PLP 5013*  Plant Virology. Prerequisite(s): 3343 or equivalent; one course in biochemistry or physiology. Transmission, characterization, differentiation, replication, and control of plant viruses; discussion of current literature.

PLP 5104*  Mycology. Lab 2. Prerequisite(s): 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 BOT 5104)

PLP 5304*  Phytopathobiology. Lab 3. Prerequisite(s): 3343. Bacteria as plant pathogens, with examination of the taxonomy, genetics, ecology, physiology, host-parasite interaction, and control of phytophobia.

PLP 5343*  Principles of Plant Pathology. Lab 2. Prerequisite(s): BOT 1404 or BOT 3463 or MICR 2125 or PLNT 2013. Introduction to basic principles and concepts of plant pathology, including the nature, cause and control of biotic and environmentally induced plant diseases. Offered in combination with PLP 3343. No credit for both 3343 and 5343. Graduate students will be expected to complete extra assignments.

PLP 5413*  Plant Disease Epidemiology. Lab 3. Prerequisite(s): 3343 or 5043. Introduction to methodology and technical equipment used in epidemiological research and application of epidemiological principles in plant disease control.

PLP 5524*  Integrated Management of Insect Pests and Pathogens. Lab 4. Prerequisite(s): 3343, ENTO 2993 or equivalent or consent of instructor. Modern theory and practices for management of insect pests and pathogens in plant production systems, emphasizing an ecologically-based, integrated approach. Basic concepts of pest management, decision-making, cost/benefit analysis, and risk/benefit analysis. (Same course as ENTO 5524)

PLP 5560*  Problems in Plant Pathology. 1-5 credits, max. 10. Prerequisite(s): Consent of instructor.

PLP 5613*  Host Plant Resistance. Lab 2. Prerequisite(s): 3343 and ENTO 2893 or 3893 or equivalent and a general genetics course; or consent of instructor. Overview of current theory and principles of biotechnology and laboratory experience with contemporary techniques and experimental methods used in biotechnology, including genome analysis, gene transfer, identification and isolation of genes and their products, and regulation of gene expression in plants and arthropods. (Same course as ENTO 5613)

PLP 5623*  Advanced Biotechnology Methods. Lab 3. Prerequisite(s): BIOL 3653, BIOL 3023 or equivalent or consent of instructor. Overview of current theory and principles of biotechnology and laboratory experience with contemporary techniques and experimental methods used in biotechnology, including genome analysis, gene transfer, identification and isolation of genes and their products, and regulation of gene expression in plants and arthropods. (Same course as ENTO 5623)

PLP 5700*  Teaching Practicum in Plant Pathology. 1-6 credits, max. 6. Prerequisite(s): Graduate student standing. Variable credit offering for graduate students who wish to develop skills in teaching, assessment and course development working in conjunction with a primary instructor.

PLP 5724*  Physiology of Host-Pathogen Interactions. Lab 4. Prerequisite(s): 3343 and BIOL 3653. Physiology of the interactions between plants and pathogens. Mechanisms by which pathogens infect and by which plants resist infection.

PLP 5860*  Colloquium. 2 credits, max. 2. Prerequisite(s): 3343. Concepts and principles of plant pathology and the literature pertinent to each. Introduction to current research. Consent of instructor.

PLP 5870*  Scientific Presentations. 1 credit, max. 5. Prerequisite(s): Consent of instructor. Preparation and delivery of scientific presentations, including 50-minute seminars, 10-minute talks, and posters. (Same course as ENTO 5870)

PLP 5992*  Career Skills and Professionalism for Scientists. Prerequisite(s): Graduate standing. For graduate students majoring in science-based fields, especially those nearing graduation. Skills needed for effective job application and interviewing, career development and advancement, communication with professional colleagues and the public, and personal professional development. (Same course as ENTO 5992)

PLP 6000*  Research. 1-12 credits, max. 36. Research for the PhD degree.

PLP 6303*  Soilborne Diseases of Plants. Lab 3. Prerequisite(s): 3343. Soilborne diseases, their reception and importance, the pathogens involved, rhizosphere and rhizotrophy influences, inoculum potential, specialization, suppressive soil effects, and disease management. Lecture and discussion sessions will emphasize in-depth understanding of problems and complexities associated with studies of soilborne pathogens.

Plant Science (PLNT)

PLNT 1101  Orientation to Plant and Soil Sciences. Introduction to areas of study, professional activities and career opportunities in plant and soil sciences.

PLNT 1213  Introduction to Plant and Soil Systems. Introduction to the concepts of plant soil systems including cropland, rangeland and pastureland. A systems approach to the importance of plant and soil resources to the producer, consumer and citizen; modern management and production practices; maintenance of natural resources.

PLNT 2013  Applied Plant Science. Lab 2. Prerequisite(s): 1213 or BOT 1404 or FOR 1123 or HORT 1013. Application of agronomic principles to the management, improvement and use of plants. Structure and growth of crop plants relating to management strategies and adaptation to varying abiotic and biotic factors. Hands-on identification of crops, weeds, and seed quality factors; application of tools and techniques.

PLNT 2041  Career Development in Plant and Soil Sciences. Prerequisite(s): Sophomore standing in plant and soil sciences. Develop personal goals in plant and soil sciences through identification of personal values, skills building, exploring professional opportunities, and networking. Graded on pass-fail basis.

PLT 3354*  Plant Genetics and Genomics. Lab 2. Prerequisite(s): BIOL 1114. Basic principles of heredity. Interrelationship between classical genetics and molecular genetics emphasized. Mendelian genetics, cytogenetics, mutations, gene regulation and genetic engineering.

PLNT 3790  Seed and Plant Identification. 1 credit, max. 2. Lab 3. Prerequisite(s): 1213. Identification and classification of agronomically important crops and weed control. (Same course as FOR 3790)

PLNT 4013*  Principles of Weed Science. Prerequisite(s): HORT 1213 or HORT 1013. Basic principles of weed biology and ecology, introduction to herbicide chemistry, and methods for preventative, cultural, mechanical, chemical, and biological weed management in cropping systems, turf, and natural landscapes. Laboratories are applied and will include weed identification, calibration of field equipment, applied grower problems, and herbicide damage identification.

PLNT 4080  Professional Internship. 1-6 credits, max. 6. Prerequisite(s): Consent of instructor. Internship must be at an approved agribusiness or other agency serving agronomy, plant science or soil science. Requires written reports and a final presentation.

PLNT 4113*  Advanced Weed Science. Prerequisite(s): 3111 and 3221. Integrated approach for weed management. Weed life cycles and biology, weed control strategies, herbicide families and their characteristics, and finally a systematic and integrated weed management system. Methods of conducting and interpreting research results in appropriate topics.

PLNT 4123*  Plant-Environment Interactions. Prerequisite(s): BOT 1404. Environmental impact on plant life cycle; (i.e. germination, flowering and senescence; plant growth responses (e.g. photosynthesis, phototropism, biomass production) to light quality, precipitation, temperature, and population or community changes.

PLNT 4353*  Plant Breeding. Prerequisite(s): 3554 or equivalent. Basic principles dealing with the improvement of plants through application of genetic principles.

PLNT 4470*  Problems and Special Study. 1-3 credits, max. 12. Lab 1-3. Prerequisite(s): Consent of instructor. Problems in plant science selected from topics in range and turf, plant breeding and genetics, crop management and physiology, and weed control.

PLNT 4571  Professional Preparation in Plant and Soil Sciences. Prerequisite(s): Senior standing in plant and soil sciences. Preparation for professional certification exams and career opportunities in plant and soil sciences. (Same course as SOIL 4571)

PLNT 4573*  Bioenergy Feedstock Production. Prerequisite(s): 1213. Understand production and management practices for potential bioenergy feedstock sources and end products. Identify physiological mechanisms to improve yield and quality under current and future climates. Use simulation and GIS tools to project biomass and ethanol yields.

PLNT 4613*  Forage and Grazinglands Resource Management. Prerequisite(s): 1213 or BOT 1404. Designing forage systems that optimize yield potential, economical livestock production and pasture system development.

PLNT 4923*  Applications of Biotechnology in Pest Management. Prerequisite(s): BIOL 1114 and CHEM 1215 or equivalents. Applications of biotechnology in managing arthropod pests of plants, animals, plant pathogens, and weeds. Introduction to underlying technology, products being developed and deployed, effectiveness and associated problems or concerns resulting from their use. (Same course as ENTO 4923 and PLP 4923)

PLNT 4933*  Plant Biotechnology and Transgenic Plants. Prerequisite(s): PLNT 3554 or ANSI 3423 or BIOL 3023. Principles and techniques in generating transgenic plants with improved agronomic traits. Controversies and consumer concerns over transgenic plants, biotechnology regulations and global status of biotech crops. Basic plant biotechnology techniques in recombinant DNA cloning, transformation, and tissue culture.

PLNT 4990  Senior Thesis in Plant and Soil Sciences. 1-6 credits, max. 6. Prerequisite(s): Consent of instructor. Supervised undergraduate research in topics related to plant and soil sciences. Completion of an approved research project based on a thesis topic or soil science will include submission of a written report and a public defense of the work.

PLNT 5000*  Master's Thesis. 1-6 credits. 6 max total credits under Plan I, and 2 max total credits under Plan II. Prerequisite(s): Consent of adviser. Research planned, conducted and reported in consultation with a major professor.

PLNT 5020*  Graduate Seminar. 1 credit, max. 3. Prerequisite(s): Graduate standing. Discussions of research philosophy, methods, interpretation, and presentations. Profession development and contributions to the scientific community. (Same course as SOIL 5020)

PLNT 5110*  Problems and Special Study. 1-4 credits, max. 12. Prerequisite(s): Consent of instructor.
Consent of instructor. Supervised study of special problems and topics not covered in other graduate courses.

PLNT 5230* Research. 1-4 credits, max 8. Prerequisite(s): Consent of a faculty member supervising the research. Supervised independent research on selected topics.

PLNT 5293* Plant Response to Water Stress. Prerequisite(s): BIOL 3853, BOT 3463. Physiological ramifications of water deficit stress on cells, tissues, plants and canopies. Discussion of the soil/plant/atmosphere continuum, and avoidance and tolerance mechanisms leading to drought resistance. Photosynthesis, transpiration, and water-use efficiency and their relationship to biomass accumulation and crop yield.

PLNT 5313* Simulation Models in Research, Management and Policy. Prerequisite(s): 1213. Use crop simulation models (CSM) and decision support systems to address challenges associated with food, fuel, feed and fiber production. Utilize CMS as research, management, and policy tools. Evaluate CSM as surrogates to field studies and to design experiments to fill in knowledge gaps.

PLNT 5403* Physiological Action of Herbicides. Prerequisite(s): BOT 3463. The mode of action, uptake and translocation, and metabolism of herbicides in crops and weeds.

PLNT 5412* Plant Breeding Methods. Prerequisite(s): 3554 or 4353 or consent of instructor. Development and application of genetic principles to breeding methods within self- and cross-pollinated crops; emphasis on selection methods pertinent to plant improvement; methods of new cultivar development, release, and commercialization.

PLNT 5433* Biotechnology in Plant Improvement. Prerequisite(s): 3554, 4353, 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 into plant breeding programs and issues concerning the release of genetically engineered organisms into the environment.

PLNT 5453* Applied Plant Genomics. Prerequisite(s): PLNT 3554 or BIOL 3023. Use and application of genomic knowledge and technology to improve agriculturally important plants. Major topics include structural and comparative genomics and their application in molecular breeding of agronomic crops.

PLNT 6000* Doctoral Thesis. 1-6 credits, max 36. Prerequisite(s): Consent of adviser. Independent research to be conducted and reported with the supervision of a research advisor as partial fulfillment of the Ph.D. degree.

PLNT 6010* Advanced Topics and Conference. 1-6 credits, max 12. Prerequisite(s): MS degree. Supervised study of advanced topics. A reading and conference course designed to acquaint the advanced student with fields not covered in other courses.

PLNT 6410* Topics in Plant Breeding and Genetics. 1-3 credits, max 6. Prerequisite(s): 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.

Political Science (POLS)

POLS 1010 Studies in American Government. 1-2 credits, max 2. Special study in American government to allow transfer students to fulfill general education requirements as established by Regents' policy.

POLS 1113 American Government. Organization, processes and functions of the national government of the United States. Satisfies, with HIST 1103 or 1483, or 1493, the State Regents requirement of six credit hours of American history and American government before graduation.

POLS 2013 (S) Introduction to World Politics. Analysis of the major concepts in international relations - power, sovereignty, self-help, cooperation, dependency, and introduction to the dominant theoretical approaches to its study realism, pluralism, Marxism, and feminism.


POLS 2033 Introduction to Public Administration. Public administration, including administration, administrative organization, decision-making, governmental public relations and administrative responsibilities.

POLS 2113 (S) Introduction to Comparative Politics. A comparative study of the political processes and institutions of contemporary societies. Introduction to the concepts and methods of comparative politics.

POLS 2993 Honors Tutorial in Political Science. Prerequisite(s): 1113. Honors standing, and invitation by head of department. For the special needs of the sophomore-level honors student majoring in political science who wishes to study individual topics at an accelerated pace in a tutorial format. After mastering basic principles in an area of interest the student will conduct independent research under close faculty supervision and prepare a report or papers.

POLS 3003 (I,S) The Soviet Union: History, Society and Culture. A comprehensive view of the Soviet Union, stressing those issues in the political, economic, technological, geographical and cultural spheres which are most relevant to the current situation. Accessible to beginning undergraduates. (Same course as HIST 3003 & RUSS 3003)

POLS 3033* International Law. The nature and scope of public international law, with emphasis on problems related to the recognition of states and governments, jurisdiction over nationals and aliens, and state responsibility in cases of expropriation and revolutionary damage.

POLS 3053 (I,S) Introduction to Central Asian Studies. A comprehensive view of newly-emerged Central Asian states examining the history, politics, economics, geography, and culture of Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmnenistan and Uzbekistan as reflected in their thoughts, religion, literature, and architecture, in the past, and the strategic importance of their natural wealth for the present and future. (Same course as GEOG 3053, HIST 3053 & RUSS 3053)

POLS 3090 Teaching Practicum. Prerequisite(s): Consent of instructor. For outstanding students. Students will work with a faculty instructor and assist in many aspects of teaching including guest lecturing, offering study sessions, office hours, among other duties as determined by instructor. May involve meetings and written paper(s).

POLS 3100 Political Science Internship. 1-6 credits, max 6. Prerequisite(s): Consent of department. Internship education experience in a specific subfield in the discipline of political science.

POLS 3101 Oklahoma Intercollegiate Legislature. OSU Oklahoma Intercollegiate Legislature provides students with hands on experience in the legislative process. It is a mock legislature with the intended goal of passing bills and learning parliamentary procedure. Students learn how to research and draft legislation, build coalitions, and debate the merits of their bills. Participation in O.I.L. gives students a behind the scenes look at how state government conducts business. The result is academic learning in a real world setting. This course is a pass/fail grade.

POLS 3103 Introduction to Political Inquiry. Prerequisite(s): 60 credit hours or 45 hours with GPA of 3.25, including 2113. The scope and methods of political science. Scientific methodology applied to political phenomena, hypothesis, measurement, literature review, research designs, introductory data analysis and writing in political science.

POLS 3123 (I) Politics of Russia/Former Soviet Union. Political processes, governmental institutions and public policies of post-Soviet Russia. Parties, elections and citizen participation in government.

POLS 3143 (I) Politics of Western Europe. State-society relations in key Western European countries, including political processes, governmental institutions, cultural pluralism and gender relations.

POLS 3163 (I) Politics of Africa. Analysis of processes, institutions and contemporary trends in the politics of selected African countries, including political development, democratization, conflict, political role of the military, political economy, and social movements.

POLS 3193 (I,S) Politics of Latin America. Analysis of processes, institutions and contemporary trends in the politics of selected Latin American countries; political development, democratization, political role of the military, political economy and social movements.

POLS 3223 Politics of East Asia. Political processes, governmental institutions and administration in China, Japan, and Korea.

POLS 3313 Politics of 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.

POLS 3353 Parties and Interest Groups. Political parties and interest groups as institutions; their role in elections and government.

POLS 3423 Voting and Elections. Electoral systems and their relationship to political development, political socialization, issue emergence, voting patterns and electoral cycles.

POLS 3443 Political Campaigns and Candidacy. Planning, fundraising, targeting, public opinion, support operations, voter contact, the mass media and candidate activities.

POLS 3453 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.

POLS 3483 The American Presidency. The politics of presidential selection, removal and succession; formal and informal powers of the president; relations with Congress, the national judiciary and national executive branch; proposed reforms and the vice-presidency.

POLS 3493* Public Policy. Prerequisite(s): Any one of 1013, 2033, 2113, ECON 1103, 2123, SOC 1113, PHIL 2113. Identification of policy options open to policy makers and examination of measurements and rationales underlying governmental programs.

POLS 3513 Public Opinion and Polling. The nature of public opinion. Public opinion polling, the factors influencing opinion formation, and the effects of public opinion on policy and policy makers.

POLS 3523 Money, Media and Politics. Prerequisite(s): 1113. Techniques used by successful candidates for elective office to present their positions to
the voting public. Beginning with the basic elements of fundraising exploration of current campaign finance laws, funding techniques and campaign budgeting. Message development, media production and ad placement. Preparation of a fundraising strategy.

POL 3533 Political Lobby and Grassroots Organization. Prerequisite(s): 1113. Traditional special interest lobbying and the rapidly emerging local grassroots constituency movement. New federal laws pertaining to lobbying and rules that govern the conduct of state lobbying. The implications of technology and the potential advent of a plebiscite form of government. Development of complete grassroots strategy on an issue either at the federal or state level.

POL 3613 State and Local Government. Political processes, government and administration of American states, cities and counties; special emphasis on Oklahoma.

POL 3663 Introduction to Political Thought. The teachings of the three lasting traditions of Western political thought: classical, Christian and modern.

POL 3683 Politics in Contemporary Film. Prerequisite(s): 1113. The effect of politics on contemporary film. Exploration of the often subtle political imagery and symbolism contained in film.

POL 3733 Incident Management and Tactical Operations. Strategic management of an emergency incident through the use of the Incident Management System. A thorough study of the IMS system and tactical decision-making forming the base for case study analysis and emergency operations simulations.

POL 3763 Mitigation and Recovery. Prerequisite(s): 3813. Introduction to recovery and mitigation activities for emergency managers. Covers components, policies, programs and organizations related to recovery and mitigation, illustrates course concepts with case studies.

POL 3813 Aim and Scope of Emergency Management. An overview of the history and current state of the art of the current emergency management system. Concepts, issues and programs associated with the development of an emergency management program. Local, state and federal roles and responsibilities for responding to disasters and emergencies with emphasis on an introduction to present day emergency management.

POL 3893 Terrorism and Emergency Management. A general introduction to the basic concepts for preparedness, response and command functions at the scene of a potential terrorist incident.

POL 3953 (D,S) Minorities in the American Political System. Prerequisite(s): 1113. Examination of mass and elite level behavior of minorities in the contemporary U.S. political system.

POL 3963 State Courts and the Bar. This course will cover the various constraints that exist within the decision-making outcomes of state courts, as well as the institutional biases found within state run criminal justice systems. It looks at the increasingly partisan nature of state court election cycles and the contemporary status of the legal academy, the Bar, and the economics of law firms. It will be particularly useful to those students thinking about continuing their education with the pursuit of a law degree.

POL 3973 (D) Race, Politics and Sports. Prerequisite(s): 1113. Historical, as well as the contemporary relationship, between race, politics and sports in the U.S. political system.

POL 3983 (S) Courts and Judicial Process. The American judiciary and legal process 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.

POL 3993 Legal Research and Analysis. Prerequisite(s): 2023 or HONR 2013. Introduction to legal research methods, including state and federal reported cases, digests, annotated codes, state and federal administrative regulations, and computerized legal research, as well as an introduction to legal reasoning and analysis and the preparation of case briefs and memoranda.

POL 4000* Topics in American Politics. 3 credits, max 6. Prerequisite(s): 1113 and 45 earned hours or consent of instructor. In-depth examination of critical topics and issues in American politics, including American political behavior and political leadership. May be repeated with different topics.

POL 4010* Topics in International Relations. 3 credits, max 6. Prerequisite(s): 2013 or 2113 or consent of instructor. In-depth examination of critical topics and issues in International Relations. May be repeated with different topics.

POL 4013* American Foreign Policy. Major problems and policies of American foreign relations since World War II and description of foreign formulation and aid administration.

POL 4020* Topics in Comparative Politics. 3 credits, max 6. Prerequisite(s): 2013 or 2113 or consent of instructor. In-depth examination of critical topics and issues in Comparative Politics. May be repeated with different topics.

POL 4043 Politics of the Global Economy. Theory and practice of international political economics. The patterns of association between political and market-based processes among nation states. Emphasis on interactions among advanced industrial states, transnational phenomena, and opportunities and pitfalls in north-south relations. No credit for credit in INTL 5043.

POL 4053 (I) War and World Politics. Foreign policies of major powers, areas of tension and sources of international conflict.

POL 4100* Problems of Government, Politics and Public Policy. 1-6 credits, max 6. Prerequisite(s): 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.

POL 4113* International Institutions. The organization, procedures, functions and role of international institutions, with emphasis on the United Nations and related agencies.

POL 4223 Comparative Political and Social Movements and the Politics of Protest. Prerequisite(s): 1113. The origins, activities and impact of political and social movements. Concepts and theoretical approaches related to political and social movements and these concepts and approaches to case studies of several contemporary movements in the United States, Latin America, and Europe.

POL 4353* Administrative Law. Legal powers, limits, and procedures of administrative agencies with emphasis on federal and state administrative procedure acts.

POL 4363* Environmental Law and Policy. Statutory law, case law, and administrative practices relating to regulation of the environment including environmental impact statements, pollution, public lands, and preservation law.

POL 4403* Urban Politics and Management. Problems of governing and managing American metropolitan areas.

POL 4413* Government Budgeting. The politics, planning and administration of government budgets. (Same as course as 5320).

POL 4453* Public Personnel Administration. Problems, processes, and procedures of public personnel administration. (Same course as 5333*)

POL 4553 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.

POL 4573 Democratic Theory. Investigates the origins, development, and continuing challenges of theories of democratic government, with particular emphasis on the American political tradition. Topics include citizenship, accountability, voting and elections, federalism, and institutional design.

POL 4593* Natural Resources and Environmental Policy. Current issues in the law, politics and administration of energy, land, water, mineral and other natural resources policy with particular emphasis on relationships to environmental policies and law.

POL 4623 (S) Oklahoma Politics. Prerequisite(s): 1113. Introduction to Oklahoma Politics. Topics include the evolution of Oklahoma political institutions; the struggle to shape the Oklahoma political culture with special attention to the role of race and woman suffrage; political issues; the structure of Oklahoma political institutions at the state and local levels; and elections.

POL 4653 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.

POL 4670* Topics in Political Theory. 3 credits, max 6. In-depth examination of critical topics and issues in classic, modern, or American political theory. May be repeated with different topics.


POL 4900 Senior Capstone Seminar. Prerequisite(s): Political science major with 85 hours. This class, open only to Political Science majors in their final year of study, is intended to be the culmination of a student's undergraduate study of Political Science. Class sessions during the first half of the semester involve a review of the discipline, in which students educate their peers about some of the essential things they have learned in their coursework. During the second half of the semester, students engage in a practicum connected to the area of work/study they intend to pursue, and they complete a significant research project.

POL 4963 U.S. Constitution: Civil Rights and Liberties. Prerequisite(s): 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 reasoning and critical thinking.

POL 4973* U.S. Constitution: Civil Liberties. Prerequisite(s): 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 reasoning and critical thinking.

POL 4980* Topics in Public Law. 3 credits, max 6. Prerequisite(s): 2023 and 3993 or consent of instructor. In-depth examination of critical topics and issues in Public Law. May be repeated with different topics.

POL 4990* Independent Study. 1-3 credits, max 9. Application of major relevant theoretical perspectives to selected case studies of political problems.
and issue areas. Theories and attendant case studies selected by visiting faculty members.

**POLS 4993 Political Science Honors Thesis.** Prerequisite(s): 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 political science.

**POLS 5000* Thesis.** 1-6 credits, max 6.

**POLS 5013* Quantitative Methods of Political Analysis.** 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.

**POLS 5020* Creative Component.** 3 credits, max 6. Individually supervised research.

**POLS 5023* Foundation of Political Science.** Overview of the foundational works, theories and approaches that define the discipline of political science and serve as bridges across its subfields.

**POLS 5030* Internship in Public Administration and Government.** 1-6 credits, max 6. Individually supervised internships in administrative and governmental career areas. Paper required.

**POLS 5040* Readings in Politics, Public Policy or Public Administration.** 1-6 credits, max 6. Prerequisite(s): Consent of supervising professor. Readings in the student's major area of study.

**POLS 5100* Directed Study.** 3 credits, max 6. Directed study for master's level students.

**POLS 5103* Research Design.** Prerequisite(s): Graduate standing. Overview of research design, including conceptualization and operationalization, literature review, deductive and inductive theorizing, hypothesis testing, quantitative and qualitative data collection and analysis.

**POLS 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.

**POLS 5133* Politics and Political Economy in the European Union.** The institutions and policy-making process of the European Union (EU) and the theoretical traditions in the study of European integration. The institutional form of the EU, the EU policy that is emergent.

**POLS 5143* Social and Political Perspectives in Europe.** Examination of the current and historical social, cultural and political landscapes of European societies. Material related to identity politics, citizenship, democratization and collective memory feature regularly in the course.

**POLS 5203* ProSeminar in International Relations.** A general survey intended to introduce students to major theoretical paradigms, applications, and debates in the field of international relations.

**POLS 5210* Topics Seminar in International Relations.** 3 credits, max 6. In-depth examination of critical topics and issues in International Relations. May be repeated up to 6 hours with different topics.

**POLS 5213* Seminar in the International Political Economy.** Prerequisite(s): Graduate standing. Research on the mechanics and theories of interaction between economic, political and social phenomena. (Same course as INTL 5213*)

**POLS 5300* Special Topics Seminar in Fire and Emergency Management.** 1-3 credits, max 9. Specialized topics in fire and emergency management.

**POLS 5303* Introduction to Fire and Emergency Management.** Prerequisite(s): Graduate standing. Examines the content and historical evolution of fire and emergency management including terminology, concepts, theories, and methods employed.

**POLS 5313* Public Management.** Introduction to the general principles of management as they are applied in the public sector. Systems theory, organization design, and techniques of supervision.

**POLS 5320* Seminar in Public Budgeting and Finance.** 3 credits, max 6. Major processes and practices involved in governmental budgeting in the United States at national, state and local level. (Same course as 4413*)

**POLS 5323* Urban Politics and Management.** Introduction to the concepts, processes and techniques of managing urban political systems to include problems of leadership, decision-making, general management and group behavior.

**POLS 5333* Seminar in Public Personnel Administration.** Current practices, problems and issues of public sector personnel administration, including merit system, civil service reform, collective bargaining, and equal opportunity and affirmative action.

**POLS 5343* Seminar in Fire and Emergency Services Administration.** Introduction to policies, procedures and administrative process required to deliver fire and emergency services; detailed examination of the social, political and economic issues that have an impact on service delivery and organizational approaches.

**POLS 5353* Seminar in Design, Structure and Processes of Public Organizations.** Administration in the public sector, stressing traditional and emerging organization structures. Awareness of administrative processes and environment that include program design, implementation, and administrative accountability.

**POLS 5363* Public Sector Dispute Resolution.** Prerequisite(s): Senior or graduate standing. Labor relations and employment issues in the public sector, and the various methods for resolving government personnel conflicts within resort to violence or litigation. Focus on labor law, employment law and Alternative Dispute Resolution as they apply to government employment.

**POLS 5383* Disaster Recovery.** Prerequisite(s): 5683. Processes, conditions and components of recovery in disaster contexts. Topics include environmental, economic, housing, infrastructure, and policy. Roles of voluntary organizations; securing and managing resources.

**POLS 5393* Politics of Disaster.** Prerequisite(s): Graduate standing and 5303 or consent of instructor. Situates disaster phases in the political context at the local, national, and international levels. Examines research on specific events and their interactive effects between the political system and various phases of disaster.

**POLS 5403* ProSeminar in Comparative Politics.** Designed as a graduate seminar to familiarize graduate students with the core research traditions and theoretical developments in the field of comparative politics.

**POLS 5410* Topics Seminar in Comparative Politics.** 3 credits, max 6. In-depth examination of critical topics and issues in Comparative Politics. May be repeated up to 6 hours with different topics.

**POLS 5510* Seminar in Political Behavior.** 1-3 credits, max 6. Examination of contemporary theories of political behavior with emphasis on empirical studies.

**POLS 5513* Seminar in Political Psychology.** Examination of psychological theories as they pertain to political behavior, including attitude change, political cognition, public opinion and decision-making.

**POLS 5513* Public Policy Analysis.** Analytical methods for evaluating public policies and examination of the public process including policy design, implementation and evaluation.

**POLS 5620* Seminar in Natural Resource Policy, Law and Administration.** 3 credits, max 9. Analysis of the legal and public policy aspects of environmental regulation, including special emphasis on one of three components: environmental law, administrative law, and national resource law and policy.

**POLS 5633* 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.

**POLS 5643* 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.

**POLS 5653* Risk Assessment in Emergency Management Planning.** Risk assessment for the emergency manager and fire department manager. Concepts of risk assessment, its use in emergency management planning, and its limitations. Applications to emergency management. Specifically designed for FEMP students, but of interest to students in environmental management.

**POLS 5663* Community Relations in Environmental and Emergency Management.** Preparation for the environmental manager, emergency manager, and department manager to communicate effectively with the public and media concerning environmental threats to human health routine and non-routine releases of chemicals and radioactive materials. Strategies for community-based planning, emergency preparedness, environmental response, site damage, and conflict management.

**POLS 5673* Understanding and Responding to Terrorism.** Exploration of the experience of non-state terrorism in the U.S. and Western European democracies in the late 20th century. Understanding terrorism as a political, social, and historical phenomenon; the current and future threat of terrorism, both foreign and domestic; governmental choices in responding to terrorism in democratic societies and; U.S. anti-terrorism policies and considerations that emergency responders face in preparing for and responding to terrorist incidents.

**POLS 5683* Emergency Management and Public Policy in the United States.** Examination of natural and man-made disasters in the U.S. along with the policies and programs intended to prevent, respond to, mitigate, and recover from such events. The evolution of the U.S. Emergency Management System, the emergency management profession, and future directions in emergency policy.

**POLS 5693* Emergency Management in the International Setting.** Introduction to emergency management in the international setting. Provides background for students who may work with international assistance programs or who may become involved in the delivery of emergency management services abroad as part of an international assistance effort.

**POLS 5703* ProSeminar in American Politics.** Overview of a wide range of classic works in American institutions and Political Behavior. It examines not only the classic works in each area of these subfields, but a sampling of current work being done in the field.
POL 5713* Seminar in Public Law. Literature of public law in the United States. Overview of the approaches that shape the theoretical and empirical contours of the public law field and contribute to multidisciplinary law and social science studies.

POL 5720* Topics in Political Science. 3 credits, max 6. In-depth examination of critical topics and issues in Political Science. May be repeated up to 6 hours with different topics.

PSYC 3513 Psychology of Learning. Introduction to the study of behavior and mental processes from a psychological perspective. Topics include classical and operant conditioning, sensory and perceptual processes, sensation and perception, attention, memory, learning, problem solving, thinking, and social and personality development.

PSYC 5720* Topics in Cognitive Science. 3 credits, max 6. In-depth examination of recent theories within psychology and the media, including effects of media on opinion, role of media as a political institution and the role of media during elections.

PSYC 5810* Seminar in Women and Politics. 3 credits, max 9. Prerequisite(s): Consent of instructor. Research on a variety of topics concerning women and politics, including women's movements, women and elections, and public opinion.

POLS 5903* Practicum in Fire and Emergency Management Administration. Prerequisite(s): Consent of instructor. Supervised practicum in fire and emergency management administration.

POLS 5923* Preparing and Planning. Prerequisite(s): Graduate standing and 5303 or consent of instructor. Planning and training for hazards and disaster management at the organizational level; review of public education and preparedness efforts at the household and community level, review of research on disaster planning.

POLS 5933* Disaster Response. Prerequisite(s): Graduate standing and 5303 or consent of instructor. Review of scientific literature on human and organizational behavior in response to disasters. Identification of actors involved in emergency response, their roles and responsibilities. Examination of human response in context of organizational structures and resources including emergency operating centers. Review of local and national government response policies.

POLS 6000* Doctoral Dissertation Research. 1-12 credits, max 60. Prerequisite(s): Consent of major professor. Research for PhD dissertation.

POLS 6003* Proseminar in Fire and Emergency Management. Prerequisite(s): Graduate standing. Examines scope of the fire and emergency management field as an area of academic inquiry.

POLS 6013* Qualitative Methods for Fire and Emergency Managers. Prerequisite(s): Graduate standing. Qualitative methods for collecting and analyzing data from fire and emergency management field.

POLS 6040* Directed Readings in Fire and Emergency Management. Prerequisite(s): Graduate standing or consent of instructor. Directed readings for doctoral students in specialized areas of fire and emergency management.

POLS 6123* Quantitative Methods for Fire and Emergency Managers. Prerequisite(s): Graduate standing and 5013 or consent of instructor. Descriptive, inferential, and non-parametric statistics with collection and analysis of data from fire and emergency management field.

POLS 6133* Seminar in Fire and Emergency Management Research Survey. Prerequisite(s): Graduate standing and 5103, 5013, and 6123. Survey of the academic literature in the fields of fire and emergency management. Development of a research article for submission to a professional journal or conference.

POLS 6143* Methods for Disaster Research. Prerequisite(s): Graduate standing and 5303; 5013 or 5103. History and scope of methods for disaster research.

POLS 6153* Pedagogical Methods for Fire and Emergency Management Instruction. Prerequisite(s): Graduate standing. History of FEMA education, review of instructional methods, and research on educational methods in field.

POLS 6203* Comparative and International Dimensions of Fire and Emergency Management. Prerequisite(s): Graduate standing and 6003 or consent of instructor. Comparative analysis of the organization, management, and policies of fire and emergency response services in other countries.

POLS 6213* Political Context of Fire and Emergency Management. Prerequisite(s): Graduate standing and 5343 or consent of instructor. Analysis of political environment impacting fire service including federalism and intergovernmental relations, interest groups, other public agencies, and private sector organizations.

POLS 6300* Advanced Special Topics Seminar in Fire and Emergency Management. Prerequisite(s): Graduate standing or consent of instructor. Specialized topics in fire and emergency management for doctoral students.

POLS 6303* Populations at Risk. Prerequisite(s): Graduate standing or consent of instructor. Describes populations at risk for increased injury, death and property loss. Identifies policies, programs and resources for risk reduction. Applied research on bases of planning and capacity building.

POLS 6313* Mitigation. Prerequisite(s): Graduate standing and recommended 5303, 6143 and 6153. Structural and non-structural mitigation approaches to hazard reduction; description of policies, programs, and planning methods relevant to all governmental levels; and review of research and case studies of mitigation efforts.

POLS 6343* Organizational Behavior in Disaster. Prerequisite(s): Graduate standing and 5303 or consent of instructor. Theoretical overview of organizational behavior in a disaster context. How organizations respond, adapt, fail and succeed when disrupted by disaster. Role of formal and informal organizational structures in confronting disasters.

Psychology (PSYC)

PSYC 1111 Making the Most of Your Psychology Degree. This course will serve as a practical guide to making the most of your time as a psychology major at OSU and preparing for your work life beyond OSU, whether in graduate school or a career. You will learn about: resources that are available within the Psychology Department at OSU to help you succeed, strategies to maximize your competitiveness as a potential graduate student or future employee, and steps to take as you plan for your career after graduation.

PSYC 1113 (S) Introductory Psychology. Principles, theories, vocabulary and applications of the science of psychology.

PSYC 2313 Psychology and Human Problems. Prerequisite(s): 1113. Personality dynamics and their application to personal, cultural and vocational experience.

PSYC 2402 Clinical Child Psychology. Prerequisite(s): Psych 1113 with grade of “C” or better. This course will present information from empirical research, key theories, and concepts that shape the current understanding of developmental psychopathology, and clinical child and adolescent psychology.

PSYC 2583 (S) Developmental Psychology. Prerequisite(s): 1113. The nature of pertinent studies, causes, and theories of human developmental phenomena across the life span.

PSYC 2593 Psychology of Human Sexuality. Prerequisite(s): 1113. Survey of behavioral, personality and psychophysiological components of human sexuality, with special emphasis on the delineation of facts from sexual myths.

PSYC 2743 (S) Social Psychology. Theories and applications of social cognition, the self, pro-social and aggressive behavior, groups, attitudes and the environment.

PSYC 3013 Psychology of Motivation. Prerequisite(s): 1113. Examines the initiation, persistence and achievement of goal-directed behavior. Theory, research and applications of these concepts are emphasized.

PSYC 3033 (S) Psychology of Humor. Prerequisite(s): PSYC 1113. The course will examine theoretical perspective on the topic of humor, including cross-cultural and individual aspects as the development of humor.

PSYC 3053 (S) Psychology of Art. Prerequisite(s): PSYC 1113. The course will examine psychological approaches to the understanding of how art is experienced and produced. The course will examine all forms of art, including visual art, music, sculpture, and other forms of artistic expression.

PSYC 3073 (N) Neurobiological Psychology. Prerequisite(s): 1113. Neural bases of human experience and behavior. Topics include sensation and perception, motivation and emotion, learning and thinking.

PSYC 3113 (N) Comparative Psychology. Prerequisite(s): 1113. Comparative study of behavior characteristics of selected samples of the animal kingdom from protozoa to humans.

PSYC 3120 Special Topics in Psychology. 1-6 credits, max 6. Prerequisite(s): 1113. Special topics in psychology to be determined by faculty.

PSYC 3173 (N) Introduction to Cognitive Science. Introduction to the study of human and artificial intelligence. The course will survey contributions to the understanding of intelligence from psychology, neuroscience, computer science, philosophy, and linguistics.

PSYC 3214 Quantitative Methods in Psychology. Prerequisite(s): PSYC 1113, and either MATH 1483 or MATH 1513 or higher. Design and evaluation of research in psychology including scales of measurement, basic research designs, and quantitative procedures for data analysis, with emphasis on problems encountered in psychological research.

PSYC 3343 Black Psychology. Prerequisite(s): PSYC 1113. Students will gain an understanding of the psychology of African Americans drawing upon African and American cultures and perspectives. The course will cover the foundations of African American psychology, African psychology, Africentric psychology, intrapersonal and interpersonal topics such as family and community, peers and friends, racial identity, and select social issues among African Americans such as physical and mental health, education, racism, and employment.

PSYC 3413 Psychology of Social Behaviors. Prerequisite(s): 1113, 3214. 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.

PSYC 3443 (S) Abnormal Psychology. Prerequisite(s): 1113, and 60 credit hours or 45 hours with GPA of 3.25. Review of major approaches to conceptualizing abnormal behavior including dynamic, social and learning-based theories. Discussion and illustration of the major forms of mental illness such as neuroses, psychoses and character disorders.

PSYC 3513 Psychology of Learning. Prerequisite(s): 1113, 3413. Behavior change as a function of experience from relatively simple learning processes.
such as classical and instrumental conditioning to relatively complex processes such as verbal learning and concept identification.

**PSYC 3713 Psychology of Memory.** Prerequisite(s): 1113 and three additional hours of psychology. Body of contemporary research on human memory and the process of knowledge acquisition with a focus on processes and strategies inside the human mind.

**PSYC 3823 Cognitive Psychology.** Prerequisite(s): 1113, 3214 or equivalent. Cognitive processes. Thinking, problem solving, visual imagery, attention, and memory search. Both theory and application emphasized.

**PSYC 3914 Experimental Psychology: Introduction to Research Methods in Psychology.** Lab 2. Prerequisite(s): 1113 and 3214 with a grade of "C" or better. Examination of fundamentals of the scientific method as applied to research in psychology. Research design, sampling, measurement, analytical, evaluative, and interpretive skills needed to understand the professional research literature. Includes a laboratory component in which students conduct research, use SPSS for data analysis, and write APA style papers.

**PSYC 3990 Teaching Practicum.** 1-6 credits, max 6. Prerequisite(s): Consent of instructor. For college students. Students will work with a faculty instructor and assist in many aspects of teaching including guest lecturing, offering study sessions, office hours, among other duties as determined by instructor. May involve meetings and written paper(s).

**PSYC 4023 (N) Evolutionary Psychology.** Prerequisite(s): Introductory Psychology. Evolutionary psychology is the scientific study of human nature that focuses on understanding the psychological adaptations that evolved to solve ancestral survival and reproductive problems. The course begins with a brief historical review of key themes in psychology and evolutionary biology. The adaptive problems, natural selection, sexual selection, cooperation, cooperation, aggression and warfare, conflict between the sexes, status, prestige, and social dominance are covered in this course.

**PSYC 4123 (D,S) Psychology of Women.** Prerequisite(s): 1113. Sex differences and the development of sex role behavior. Encompasses the psychological dynamics of developmental and social issues for women.

**PSYC 4133 Multicultural Psychology.** Prerequisite(s): 1113. Psychological theories and research pertinent to multicultural psychology.

**PSYC 4143 Psychology and Law.** Lab 1. The new psycho-legal literature reviewed with emphasis on the psychological basis of voir dire, eyewitness behavior, courtroom persuasion, jury deliberation and mental health issues.

**PSYC 4153 Psychology and Mass Media.** Prerequisite(s): 1113. Examination of the role of mass media in shaping public perceptions of mental illness and mental health treatment with a focus on the role of popular films. Students will learn to critically evaluate the veracity of film portrayals as well as common themes involving mental health. Also, aspects of social and cognitive psychology in film.

**PSYC 4163 (D) Psychology of Prejudice and Discrimination.** Prerequisite(s): PSYC 1113. Explores the nature and causes of stereotyping, discrimination and minority experience, mainly from a psychological perspective. Examines how these issues impact social group members, especially members of low status or minority groups.

**PSYC 4183* Issues in Clinical Psychology.** Prerequisite(s): PSYC 1113 and three additional credit hours in psychology. Problems of the individual in contemporary society and various clinical approaches that have been proposed as possible solutions to these problems.

**PSYC 4213 (S) Conflict Resolution.** Prerequisite(s): 1113. Interpersonal conflict studied from psychological perspectives. Types and uses of conflict, and conditions for constructive dispute settlement.

**PSYC 4223* Decision Making and Problem Solving.** Prerequisite(s): 1113 or consent of instructor. An examination of the research literature on individual decision-making and problem solving with dual emphases on theory and application. A thorough prior understanding of the human cognitive system is desirable, but not required.

**PSYC 4233 The Nature of Leadership.** Prerequisite(s): 1113 or consent of instructor. The study of current psychological approaches to leadership, including trait, behavioral, and psychodynamic approaches. Psychological approaches to research and applied aspects of leadership.

**PSYC 4303* Psychology of Aging.** Prerequisite(s): 1113 and 2583. This course aims to increase your understanding of the human aging process through traditional classroom experiences focusing on knowledge of the physical, cognitive, and social changes that are part of late adulthood. Additionally, students will learn more actively by working with older adults who are living in our community. The overall goal is to enhance your understanding of the psychology of aging by integrating our classroom-acquired knowledge with our community service experiences.

**PSYC 4263 Affective Neuroscience.** Prerequisite(s): PSYC 1113. This course will examine biological mechanisms underlying emotions. Topics include basic theories of emotion, the neural circuits associated with emotion generation, as well as related cognitive processes.

**PSYC 4283 Health Psychology.** Prerequisite(s): PSYC 1113. This course will explore the interplay between psychology and health, including the psychological impact of illness, psychological contributions to illness and wellness, health behaviors, and psychological interventions to improve health and healthcare.

**PSYC 4293* Forensic Psychology.** Prerequisite(s): PSYC 1113. This course provides an introduction to forensic psychology, the relationship between psychology and law. The course examines five specialties of forensic psychology including associated careers.

**PSYC 4333* Personality.** Prerequisite(s): 1113 or consent of instructor. Basic assumptions, research, and clinical issues relating to the major personality theories.

**PSYC 4343 (S) Language Development.** Prerequisite(s): 1113 or consent of instructor. Current theory and research on the development of language throughout the lifespan. The nature of language, first language acquisition, second and third language acquisition, brain and language, language processing, social aspects of language, gender differences in language use and language processing, language use by older adults, language use directed at older adults, language disorders, and language use in special populations.

**PSYC 4353 Personalism and Modern Psychology.** Students read from the original works of Plato, Aristotle, Thomas Aquinas, and others to address the questions of anthropology: "what is a human being?" Modern theories and methods of psychology are then explored and critiqued in light of these works. The overarching goal is to develop an integrated view of what it means to be a person.

**PSYC 4483 (S) Psychology of Parent Behavior.** Prerequisite(s): 1113. Historical and contemporary conceptions of parent-child relationship and approaches to communication and discipline; special problems in parenting.

**PSYC 4493* History of Psychology.** Prerequisite(s): 1113. History of psychology as an aspect of European intellectual history. Psychological thought from early philosophical roots to modern conceptions of psychology as a science.

**PSYC 4573 Victimization.** This course combines various academic disciplines to introduce the field of Victimization. This course represents an overview of the Victimology field; courts, victim services, victimization, and personnel issues. Students use the on-line and reading material to build a framework for understanding the wide field of Victimology together with victim issues and career opportunities. Same course as SOC 4573.

**PSYC 4770 Undergraduate Senior Thesis.** 1-6 credits, max 6. Prerequisite(s): PSYC 1113, PSYC 3214, PSYC 3914, junior or senior standing and consent of instructor. Supervised independent research for the bachelor's degree.

**PSYC 4813* Psychological Testing.** Prerequisite(s): 1113 and 3214. Quantitative aspects of measurement and testing, with emphasis on scaling, standardization, reliability and validity. Basic principles of construction and the ethics of use.

**PSYC 4880 Senior Honors Thesis.** 1-6 credits, max 6. Prerequisite(s): 3214, departmental invitation, senior standing. Honors College participation. A guided reading and research program ending with an honors thesis under the direction of a senior faculty member. Required for graduation with departmental honors in psychology.

**PSYC 4883 Current Issues in Psychology.** Prerequisite(s): 3214, 3914. A capstone course examining current issues in psychology, their relationship to current issues in other academic disciplines, and their relevance in an educated society.

**PSYC 4990* Special Problems.** 1-6 credits, max 6. Prerequisite(s): 1113, 3214 and consent of instructor. Supervised research experiences in psychology with a faculty member. May involve meetings and written paper(s).

**PSYC 5000* Thesis.** 1-6 credits, max 6. Required of all graduate students majoring in psychology and writing a thesis.

**PSYC 5103* Psychopathology.** Prerequisite(s): Graduate standing in psychology or consent of instructor. Principles of diagnosis and treatment of major disorders.

**PSYC 5120* Psychology Workshop.** 2-6 credits, max 6. Provides an opportunity to study specific psychological problems, both applied and theoretical.

**PSYC 5153* Cognitive Assessment.** Lab 1. Prerequisite(s): 3443, 4813; graduate standing in the clinical program of the Department of Psychology or consent of instructor. Issues of psychological testing and assessment, psychometric theory, and ethics of testing as well as fundamental skills of cognitive and intellectual assessment, including administration, scoring, and interpretation of cognitive tests and report writing. Application of cognitive tests to specific clinical problems.

**PSYC 5193* Ethics and Professional Development in Psychology.** Prerequisite(s): Graduate standing in the Department of Psychology. Principles of ethics with a focus on the guidelines and standards for psychology. Legal and ethical issues for the practice of clinical psychology.

**PSYC 5233* Introduction to Clinical Methods.** Prerequisite(s): Consent of instructor. Introduction to a variety of topics relevant to clinical psychology training and professional development. Course will provide a foundation for subsequent training experiences. A special emphasis is placed upon developing the common therapy skills that will form a foundation for future clinical training experiences.

**PSYC 5304* Quantitative Methods in Psychology I.** Lab 2. Prerequisite(s): 3214 or equivalent. Hypothesis testing, chi-square, student’s t, bivariate.
correlation and linear regression in psychology. Critical thinking regarding the application of statistical methods is stressed. The use of contemporary statistical software for analyses is covered.

PSYC 5314* Quantitative Methods in Psychology II. Prerequisite(s): 5304. Higher-order analysis of variance designs, correlation and regression techniques, and analysis of covariance, with emphasis on applications to psychological experimentation. Computer applications of all procedures using SPSS and/or SAS during the lab.

PSYC 5333* Systems of Psychotherapy. Prerequisite(s): 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.

PSYC 5380* Research. 1-12 credits, max 24. Prerequisite(s): Consent of instructor. Research project on some psychological problem.

PSYC 5620* Seminar in Psychology. 1-12 credits, max 12. Prerequisite(s): Consent of instructor. Consideration of special topics that are particularly timely or technical.

PSYC 5660* Teaching Practicum. 1-2 credits, max 2. Prerequisite(s): Consent of instructor. Primarily for graduate students with well-defined new teaching responsibilities.

PSYC 5813* Lifespan Cognitive Developmental Psychology. Prerequisite(s): Consent of instructor. Examines theory and basic research related to the age-related changes in human cognition that occur for a typically developing individual during infancy, childhood, early adulthood, middle age and late adulthood.

PSYC 5823* Cognitive Processes. Theory and experimental research findings dealing with human thought processes from a developmental and functional standpoint.

PSYC 5913* Lifespan Social Developmental Psychology. Prerequisite(s): Consent of instructor. Examines theory and basic research in social, emotional, and personality development in infancy, childhood, adolescence, and adulthood.

PSYC 6000* Dissertation. 1-16 credits, max 60. Research and report thereon by graduate students in partial fulfillment of requirements for the Doctor of Philosophy degree.

PSYC 6083* Principles of Behavior Therapy. Prerequisite(s): Graduate standing in the clinical program of the Department of Psychology or consent of instructor. Principles and procedures of behavior therapy and modification.

PSYC 6133* Ethnic and Cultural Diversity in Psychotherapy. Prerequisite(s): Six credit hours of psychology and consent of instructor. Increasing understanding and appreciation of ethnic and cultural diversity in the psychotherapy context. Critical examination of theory and research related to psychotherapy with multicultural populations.

PSYC 6143* The Psychology of Substance Abuse. Prerequisite(s): 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.

PSYC 6173* Child Psychopathology and Treatment. Prerequisite(s): 2583, 3443 or equivalent; graduate standing in the clinical program of the Department of Psychology, the graduate school psychology program or the psychophysiology program, or consent of instructor. Theoretical positions and issues in child psychopathology. Procedures used in the treatment of psychological disorders of children.

PSYC 6233* Research Design. Prerequisite(s): 3914 and doctoral level standing. Experimental techniques in psychophysics, sensory processes, attention and perception, motivation and emotion, and learning and memory.

PSYC 6233* Clinical Research Design. Prerequisite(s): 5304 and 5314 or consent of instructor. Methodology and research practices in clinical psychology, including experimental design, research practice, data analysis and interpretation, ethical considerations of research, and the underpinnings, design, and genetic perspectives.

PSYC 6253* Seminar in Human Development. Prerequisite(s): Consent of instructor. Behavioral aspects of development from the prenatal period to senescence. Normal development contrasted to exceptional development.

PSYC 6353* Psychology of Motivation. Prerequisite(s): 3914. Outline of theory and research in human and animal motivation.

PSYC 6393* Language Development. Review of data and theories of language development. Laboratory techniques and experimental designs will also be reviewed to emphasize understanding of past and contemporary research in language development.

PSYC 6443* Behavioral Medicine. Prerequisite(s): Graduate standing in the clinical program of the Department of Psychology; consent of instructor. An advanced graduate course for students in training for a PhD 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.

PSYC 6453* Pediatric Psychology. Prerequisite(s): Graduate standing in the Department of Psychology; consent of instructor. Overview of the field of pediatric psychology, including historical perspectives, theoretical underpinnings, and application to a variety of child health problems. Childhood chronic illness, injury prevention, pain management, and consultation and intervention in medical contexts.

PSYC 6483* Neurobiological Psychology. Prerequisite(s): 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.

PSYC 6523* Family Treatment Methods. Prerequisite(s): 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.

PSYC 6563* Advanced Social Psychology. Prerequisite(s): 2743. History, theory and experimentation of dynamic interaction of group membership and individual behavior.

PSYC 6583* Developmental Psychobiology. Prerequisite(s): 3073 or equivalent; consent of instructor. An exploration of the biological aspects of human development with particular emphasis on the physiological, ethological, and genetic perspectives.

PSYC 6613* Experimental Learning Theories. Prerequisite(s): Nine credit hours of psychology. Basic concepts and empirical findings in animal and human learning.

PSYC 6640* Clinical Practicum. 1-12 credits, max 17. Prerequisite(s): Graduate standing in the clinical program of the Department of Psychology. Practicum experience for graduate students in the clinical psychology program.

PSYC 6650* Practicum. 1-16 credits, max 16. Prerequisite(s): 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.

PSYC 6723* Child Diagnostic Methods. Prerequisite(s): 5153, graduate standing in the clinical program in psychology or the doctoral school psychology program or consent of instructor. Administration and interpretation of diagnostic instruments used specifically with children.

PSYC 6753* Assessment of Personality. Prerequisite(s): Graduate standing in the clinical program or consent of instructor. Personality assessment and training in the practice of clinical assessment. Trait theory and assessment techniques of test construction, contemporary assessment techniques including the MMPI-2, test result interpretation and communication, and behavioral methods of assessment.

PSYC 6813* Multivariate Statistics for Psychology. Prerequisite(s): 5304 and 5314 or permission of instructor. A variety of multivariate statistical methods are covered with emphasis on their application to psychological research. Factor analysis, MANOVA, CANONA, Generalized Procrustes Analysis, as well as other topics are covered. Matrix algebra is also reviewed, and the geometric approach to multivariate statistics is introduced.

PSYC 6913* Multilevel Modeling in Psychology. Prerequisite(s): 5304 and 5314; or permission of instructor. Trains students in the theory and application of multilevel models for nested and repeated measures data in psychology.

PSYC 6990* Advanced Internship in Clinical Psychology. Prerequisite(s): Graduate standing in the clinical psychology program or consent of instructor. Designed to provide advanced clinical training in preparation for receipt of the Ph.D.

Recreation Management and Recreational Therapy (RMRT)

RMRT 2403 Leisure and Society. The leisure phenomenon, the leisure services industry, and societal views of leisure in the United States. Exploration of social and social views of leisure and how those views impact individuals, families and social groups. Previously offered as RMTR 2403.

RMRT 2413 Introduction to Leisure Services. The nature, scope and significance of leisure and recreation. Delivery systems for leisure services, major program areas and the interrelationship of special agencies and institutions serving the recreation needs of society. Previously offered as RMTR 2413.

RMRT 2433 Introduction to Recreational Therapy. Theory and application of recreational therapy with emphasis on types of illnesses and disabilities, delivery systems, programming services. Previously offered as RMTR 2433.

RMRT 2443 (D.S) Contemporary Issues in Diversity. Exploration of the primary and secondary dimensions of diversity and their impact on society. Individuals and institutional responses to cultural diversity. Previously offered as RMTR 2443.

RMRT 2463 Laboratory in Leisure Services. Lecture, discussion and experiential learning of recreation and leisure activities. Adapted activities, small and large group games, sports, arts and crafts, music, drama and cultural
RMRT 2473 Foundation of Leisure Service Leadership. Introduction to the principles and practical application of group leadership techniques, problem solving, supervision and evaluation of personnel. Previously offered as RMTR 2473.

RMRT 3010 Leisure Services Workshop. 1-3 credits, max 6. Intensive training program on a specialized topic. Previously offered as RMTR 3010.

RMRT 3212 Lifeguard Training. Theory and practice of water safety and rescue skills essentials for lifeguards. May obtain American Red Cross Lifeguard Training Certification. Previously offered as RMTR 3212.

RMRT 3313 Camp Operations and Programs. Operations and programming for day and resident camps. Includes all camp setting and camper populations. Previously offered as RMTR 3313.

RMRT 3413 Recreational Therapy and Mental Illness/Intellectual Disabilities. Prerequisite(s): RMTR 2433. The role of recreational therapists (RT) working with individuals diagnosed with mental illness and/or intellectual disabilities. Topics include terminology, etiology, prognosis, assessment, and program development in RT. Previously offered as RMTR 3413.

RMRT 3423 Recreational Therapy in Geriatric Practices. Prerequisite(s): RMTR 2433. The role of Recreational Therapists working with the geriatric population. Topics include terminology, etiology, prognosis, assessment, and program development in RT. Previously offered as RMTR 3423.

RMRT 3431 Recreation Management Practicum I. Prerequisite(s): RMTR 2413. Supervised practical experience with leadership responsibilities for planning, conducting and evaluating activities and programs. Previously offered as RMTR 3431. Graded on a pass-fail basis.

RMRT 3432 Recreation Management Practicum II. Supervised practical experience with leadership responsibilities for planning, conducting and evaluating activities and programs. Previously offered as RMTR 3432. Graded on a pass-fail basis.

RMRT 3433 Recreational Therapy and Physical Disabilities. Prerequisite(s): RMTR 2433. The role of Recreational Therapists in the rehabilitation of individuals with physical disabilities. Topics include terminology, etiology, prognosis of specific problems, assessment, and program development in RT. Previously offered as RMTR 3433.

RMRT 3441 Warm Water Therapy Lab. This aquatic lab course is designed to give students valuable hands-on experience with participants with disorders ranging from pre-school to senior citizen population. Previously offered as RMTR 3441.

RMRT 3463 Program Design in Recreation Management Services. Prerequisite(s): MATH 1513, MATH 1483 or equivalent. Emphasis on organization, supervision, promotion and evaluation of programs. Previously offered as RMTR 3463.

RMRT 3476 Medical Procedures for Recreational Therapy. Prerequisite(s): Co-requisite of RMTR 3480. The course covers the basic knowledge documentation including abbreviations, symbols, prefixes, and suffixes typically used in clinical settings in which Recreational Therapists practice. Previously offered as RMTR 3476.

RMRT 3480 Junior Internship. 3-6 credits, max 6. Prerequisite(s): RMTR 2413, RMTR 2473, RMTR 3441, co-requisite RMTR 3473 and one course in emphasis areas of study (Recreational Therapy or Leisure Service Management). Supervised practical experience (minimum 200 to 400 contact hours based upon credit hours enrolled) with leadership responsibilities for planning, conducting and evaluating activities and programs. Previously offered as RMTR 3480. Graded on a pass-fail basis.

RMRT 3491 Pre-Internship in Leisure Services. Preparation for internship in recreational therapy and leisure services management. Previously offered as RMTR 3491.

RMRT 4010 Directed Studies in Recreation. 1-3 credits, max 6. Prerequisite(s): Consent of instructor and program head. Supervised readings, research or study of trends and issues related to leisure studies. Previously offered as RMTR 4010.

RMRT 4213 Water Safety Instructorship. 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). Previously offered as RMTR 4213.

RMRT 4433 Evaluation of Leisure Services. Prerequisite(s): STAT 2013. Methods, techniques and application of the evaluation process related to a wide variety of leisure service functions: clientele, programs, personnel, facilities and organization. Previously offered as RMTR 4433.

RMRT 4453* Outdoor Education. Development of a holistic approach to teaching and learning in the outdoors. Learning in, about, and for, the out-of-doors as a process for acquiring skills with which to enjoy outdoor pursuits. Previously offered as RMTR 4453.

RMRT 4463* Areas and Facilities in Leisure Services. Prerequisite(s): LEIS 3463 or consent of instructor. Planning, design and development of areas and facilities in leisure service delivery systems. Previously offered as RMTR 4463.

RMRT 4473* Recreation in the Natural Environment. Theory and practical application of outdoor recreation concepts with emphasis on philosophies, principles, policies, economics, trends and problems. Previously offered as RMTR 4473.

RMRT 4480 Internship in Recreational Therapy. 1-9 credits, max 9. Prerequisite(s): Last semester senior year with cumulative GPA of 2.5 and completion of RMTR 3480, RMTR 4481 and co-requisite of RMTR 4483. Supervised fieldwork experience in recreational therapy. Graded on a pass-fail basis. Must be taken concurrently with RMTR 4483. Previously offered as RMTR 4480.

RMRT 4481 Senior Seminar in Leisure Services. Prerequisite(s): RMTR major; completion of a minimum of 15 hours of Leisure Studies core courses. Culminates of course work in leisure studies. Examination of current issues, professional practices and personal philosophy of leisure. Previously offered as RMTR 4481.

RMRT 4483 Administrative Documentation in Internship for Recreational Therapy. Prerequisite(s): Last semester senior year with cumulative GPA of 2.5 and RMTR 3480, RMTR 4481 and co-requisite of RMTR 4480. Assignment based course that complements RMTR 4480 Internship in recreational therapy. Must be taken concurrently with RMTR 4480. Previously offered as RMTR 4483.

RMRT 4493 Administration of Leisure Services. Decision-making, problem solving, personnel policies, legal issues, fiscal policies and budget procedures related to delivery of leisure services. Previously offered as RMTR 4493.

RMRT 4513* Leisure Education. Prerequisite(s): RMTR 3463. Models of leisure education discussed and practices in conjunction with enhancing student’s ability with basic skills of leisure counseling to facilitate optimal leisure pursuits. Previously offered as RMTR 4513.

RMRT 4553 Tourism in Recreation Settings. Theory and foundations of the philosophy, principles and practices that associate tourism with recreation agencies and settings. Previously offered as RMTR 4553.

RMRT 4563* Entrepreneurial Recreation Management. Prerequisite(s): RMTR 3463 or consent of instructor. Introduction to the scope, characteristics and management aspects of the commercial recreation industry from an entrepreneurial perspective. Previously offered as RMTR 4563.

RMRT 4680 Internship in Recreation Management Services. 1-9 credits, max 9. Prerequisite(s): Last semester senior year with cumulative GPA of 2.5 and 500 verified experience hours. RMTR 4481 and co-requisite of RMTR 4683. Supervised field work experience in Leisure Services Management. Graded on a pass-fail basis. Must be taken concurrently with RMTR 4683. Previously offered as RMTR 4680.

RMRT 4683* Administrative Documentation in Internship for Recreation Management. Prerequisite(s): Last semester senior year with cumulative GPA of 2.5 and 500 verified experience hours. RMTR 4481 and co-requisite of RMTR 4680. Assignment based course that complements RMTR 4680 Internship in Leisure Services Management. Must be taken concurrently with RMTR 4680. Previously offered as RMTR 4683.

RMRT 4933* Advanced Methods in Recreational Therapy. Prerequisite(s): RMTR 3483 and consent of instructor. Theoretical and practical examination of contemporary implementation procedures used in recreational therapy practice. Previously offered as RMTR 4933.

RMTR 4943* Grant Writing and Nonprofit Management. Methods and techniques used in grant writing as well as the establishment of a nonprofit agency. Previously offered as RMTR 4943.

Religious Studies (REL)
REL 1103 (H) Introduction to World Religions. 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.

REL 2013 (H) Hebrew Scriptures. A study of the Hebrew Scriptures with emphasis upon content, historical context, religious theology and the critical analysis and theological interpretation of selected passages.


REL 3223 (H) The Teachings of Jesus in Historical Context. Prerequisite(s): 2023. The teachings of Jesus in light of modern historical research. Emphasis on interpreting selected passages from the Gospels.

REL 3243 (H) Paul and the Early Church. Prerequisite(s): 2023. The letters of Paul in their historical context with special emphasis on his theology and ethics.

REL 3573 (D) The Religions of Native Americans. Prerequisite(s): 1103. Selected tribal worldviews, belief systems and religious ceremonies as depicted in oral traditions, songs, and literature. Emphasis on Northern and Southern Plains Indians.

REL 3713 Religion, Culture and Society. Prerequisite(s): 1103, ANTH 2353, SOC 1113. An introduction to the scientific study of religion. Religious activity in both tribal and technological societies studied in the light of contemporary interpretations of culture and of social behavior. (Same course as SOC 3713)

REL 4033 (H) American Christianity through the Colonial Period. A study of

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the planting, development and spread of Christianity in America, beginning with the European roots and continuing through the colonial period up to c.1800.

REL 4050 Studies in Religion. 1-6 credits, max. 9. Independent studies, seminars and courses on selected topics in religion.

REL 4113 (H,I) The World of Islam: Cultural Perspectives. The cultural heritage of Islam, its relations to history and to the ideas expressed in the art, architecture, and literature of the Muslim peoples.

REL 4213 (H,I) Understanding Global Islam. A study of the history of Islam starting from Prophet Muhammad to the spread of the Islamic Empire. How Islam moved from Arabia to the world. Introduction to the Islamic divisions, where they are now; why they are similar and different in terms of laws, schools, countries, literature, sciences, Arabic script, the Shiia, the Sunna, and different Islamic countries’ practices. Also, debatable issues on Muslim women in American and other countries and why those are different from others.

REL 4223 (H,I) Religions and Sects in the Middle East. A study of the religions of the Middle East and their diverse sects, focusing on how culture and religion shape the Middle East.

REL 4330 Seminar in Biblical Studies. 3 credits, max. 9. Prerequisite(s): Two courses in Biblical studies. Selected topics in the academic study of the Bible.

REL 4413 Classic Christian Writings. A study of the primary source material from representative Christian authors scattered throughout two thousand years of church history, focusing on understanding the backgrounds from which the writings emerged, and grasping the writers’ key ideas.

Research (RES)

RES 5013* Principles of Writing and Evaluating Scientific Research. Fundamentals of effective scientific writing. Instruction focuses on the process of writing and publishing scientific manuscripts as well as reviewing scientific research.

RES 5023* Introduction to Clinical Epidemiology. Introduction to the principles of epidemiology. This course covers causation, epidemiological research designs, measures of disease frequency and association, detection of confounders and interaction, ethics and issues pertaining to the validity and applicability of research in medicine.

RES 5033* Clinical Trials. Fundamentals of clinical trials, including design, conduct, analysis and interpretation of trial results. Topics will include commonly used designs, methods for randomization, blinding and sample size determination, choice of controls, collaborative/multicenter trial requirements and operational issues.


RES 5052* Grant Writing. Expertise to prepare, write and submit a research grant proposal. This course will assist in identifying relevant resources in order to find funding sources.

RES 5063* Meta-Analysis and Systematic Reviews. Study selection and quality assessment, effect size estimates and conversions, handling publication bias, fixed and random effects models, heterogeneity of effects, analysis of meta-analytic data, data presentation, and use of meta-analysis software.

RES 5073* Research Compliance. Fundamentals of all areas of clinical research and research compliance including clinical trials, human subject research, environmental health and safety, and other areas of research compliance administration.

Research, Evaluation, Measurement and Statistics (REMS)

REMS 5000* Master’s Thesis. 1-6 credits, max. 6. Prerequisite(s): Consent of instructor.

REMS 5013* Research Design and Methodology. An introduction to the concepts of research design, methodology, sampling techniques, and internal/external validity. An introduction to scientific method in educational problem solving. Critical analysis of educational research studies and the writing of proposals.

REMS 5320* Seminar in Research, Evaluation, Measurement and Statistics. 3-6 credits, max. 6. Prerequisite(s): Consent of instructor. In-depth exploration of contemporary problems of research, evaluation, measurement, and statistics.

REMS 5330* Practicum in REMS. Apply skills and concepts of educational research, evaluation, measurement and statistics (REMS) and gain professional experience in a mentored applied setting.

REMS 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.

REMS 5953* Statistical Methods in Education. Statistical methods needed by conductors and consumers of research in education and the behavioral sciences. Introduction to interpretation and application of descriptive and inferential statistics.

REMS 5963* Computer Applications in Nonparametric Data Analyses. Presents popular nonparametric statistical methods as applied to educational and behavioral research. Emphasis on conceptual, rather than mathematical development, application, use of computer for data analysis, and substantive interpretation.

REMS 6000* Doctoral Dissertation. 1-25 credits, max. 25. Prerequisite(s): Consent of instructor. Required of all candidates for doctorate in applied behavioral studies. Credit given upon completion and acceptance of dissertation.

REMS 6003* Analyses of Variance. Prerequisite(s): 5013 and 5953 and 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.

REMS 6013* Multiple Regression Analysis in Behavioral Sciences. Prerequisite(s): 6003 or consent of instructor. Applications of multiple regression as a general data analysis strategy for experimental and non-experimental research in behavioral sciences.

REMS 6023* Psychometric Theory. Prerequisite(s): 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.

REMS 6033* Factor Analysis in Behavioral Research. Prerequisite(s): 6013 or equivalent. In-depth analysis of principal components and factor analysis methods, including maximum likelihood methods. Confirmatory factor analysis methods are also introduced.

REMS 6320* Doctoral Seminar in REMS. 1-3 credits, max. 9. Prerequisite(s): Permission of instructor. Theory and applications of selected advanced research and evaluation methods.

REMS 6373* Program Evaluation. Prerequisite(s): 5013 and 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 nationwide multi-year projects. Special emphasis on evaluation requirements of federally funded programs.

REMS 6383* Program Evaluation II. Prerequisite(s): 6373. Practical application of principles and standards by conducting a program evaluation.

REMS 6663* Applied Multivariate Research in Behavioral Studies. Prerequisite(s): 6013 or consent of instructor. An overview and analysis of multivariate procedures commonly applied to educational and behavioral research. Emphasis on conceptual design and application of these procedures.

REMS 6850* Directed Reading. 1-6 credits, max. 6. Prerequisite(s): Consent of instructor. Directed reading for students with advanced graduate standing.

Russian (RUSS)

RUSS 1115 Elementary Russian I. Lab 1.5. Understanding, speaking, reading, and writing. Method of instruction is audio-lingual. Not for native speakers per University Academic Regulation 4.9.

RUSS 1225 Elementary Russian II. Lab 1.5. Prerequisite(s): 1115 or equivalent. Continuation of 1115. Not for native speakers per University Academic Regulation 4.9.

RUSS 2115 Intermediate Russian I. Prerequisite(s): 1225 or equivalent. Continuation of 1225. Russian grammar, composition and conversation. Not for native speakers per University Academic Regulation 4.9.

RUSS 2225 Intermediate Russian II. Prerequisite(s): 2115 or equivalent. Continuation of 2115. Not for native speakers per University Academic Regulation 4.9.

RUSS 3003 (LS) The Soviet Union: History, Society and Culture. A comprehensive view of the Soviet Union, stressing those issues in its political, economic, technological, geographical, and cultural situation. Accessible to beginning undergraduates. (Same course as HIST 3003 & POLS 3003)

RUSS 3003 (LS) Introduction to Central Asian Studies. A comprehensive view of newly-emerged Central Asian states examining the history, politics, economics, geography, and culture of Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan as reflected in their thoughts, religion, literature, and architecture, in the past, and the strategic importance of their natural wealth for the present and future. (Same course as GEOG 3053, HIST 3053 & POLS 3053)
Prerequisite(s): 20 hours of Russian or equivalent proficiency. Development of conversational skills in formal and informal Russian language; study of oral communication and idioms; vocabulary enhancement.

RUSS 3123 (H) Russian Culture and Civilization. Art, literature, music, architecture, and contemporary life of Russia. Course taught in English.

RUSS 3223 Russian Composition. Prerequisite(s): 20 hours of Russian or equivalent proficiency. The development of all forms of written communication in Russian through practice in writing compositions, letters, reports, and other documents in Russian.

RUSS 4013 Survey of Russian Literature I. Prerequisite(s): 20 hours of Russian or equivalent proficiency. Survey of Russian literature from its beginning to late nineteenth century with readings in Russian of representative texts. Course conducted in Russian.

RUSS 4023 Survey of Russian Literature II. Prerequisite(s): 20 hours of Russian or equivalent proficiency. Survey of Russian literature from late nineteenth century to post-Soviet era with readings in Russian of representative texts. Course conducted in Russian.

Science and Math Education (SMED)

SMED 1011 Inquiry Approaches to Teaching-Step 1. Prerequisite(s): Interest in exploring teaching as a career. Master teachers introduce students to examples of high-quality inquiry-based lessons and model the educational concepts through which they are being introduced. In Step 2, students prepare and participate in the teaching of three (3) lessons in elementary classrooms.

SMED 2011 Inquiry-Based Lesson Design-Step 2. Prerequisite(s): SMED 1011 and an interest in exploring teaching as a career. Master teachers introduce students to examples of high-quality inquiry-based lessons and model the educational concepts to which they are being introduced. In Step 2, students prepare and participate in the teaching of three (3) lessons in middle school classrooms.

SMED 3013 Knowing and Learning in Mathematics and Science. Prerequisite(s): SMED 1011 and 2011. Expands the prospective teacher’s understanding of current theories of learning and conceptual development. Students examine their own assumptions about learning and critically examine the needs of a diverse student population in the classroom.

SMED 3153 Teaching Mathematics at the Primary Level. Prerequisite(s): Grade of “C” or better in MATH 3403 or 3603; six hours of math; consent of instructor. Developmental levels in selection and organization of content and procedures for primary mathematics.

SMED 4003* Teaching Fundamental Concepts of Mathematics. Prerequisite(s): Full admission to Professional 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.

SMED 4013 Classroom Interactions. Prerequisite(s): SMED 1011, 2011, 3013, and full admission to Professional Education. A close examination of the interplay between teachers, students, and content, and how such interactions enable students to develop deep conceptual understanding. Students will learn how content and pedagogy combine to create effective teaching.

SMED 4023 Problem-Based Learning in Mathematics and Science. Prerequisite(s): SMED 1011, 2011, 3013, 4013, CIED 4613 or 4003, and full admission to Professional Education. Explores authentic, important, and meaningful questions of real concern to students. Students will work in teams to formulate questions, make predictions, design investigations, collect and analyze data, make products and share ideas.

SMED 4053* Teaching Geometry in the Secondary School. Prerequisite(s): Full admission to Professional Education. Overview of the present secondary geometry curricula and future trends. Axiomatic development of Euclidean geometry, proofs and transformational geometry from the perspective of the secondary mathematics teachers. Study and comparison of contemporary basic mathematics textbooks. Recommended to be taken after or concurrently with MATH 4403.

SMED 4153 Teaching Mathematics at the Intermediate Level. Prerequisite(s): SMED 3153 or SMED 5013 (for Graduate Students) and MATH 3403 and MATH 3603, full admission to Professional Education. Selection and organization of content, procedures for instruction, and evaluation of outcomes in teaching the mathematics of the intermediate grades. Some attention to instruction in upper grades of the elementary school.

SMED 4353 Science in the Elementary School Curriculum. Prerequisite(s): Completion of 12 hours with a grade of “C” or better in required science courses and be fully admitted to Professional Education. The purposes, selection and organization of content, teaching and learning procedures and evaluation of outcomes in elementary school science.

SMED 4560* Environmental Education. 1-4 credits, max 4. 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. (Same course as CIED 5730.)

SMED 4613* Teaching the Nature of Science Through an Inquiry Approach. Prerequisite(s): Full admission to professional education. This course is designed to assist pre-service science teachers in developing skills to teach science through an inquiry approach. Guided readings, discussions, group activities, and classroom field experiences, will focus on strengthening views on the nature of science.

SMED 4713* Teaching and Learning Science in the Secondary School. Prerequisite(s): CIED 4613, and full admission to Professional Education. Explores authentic, important, and meaningful questions of real concern to students. Explores student’s role in education. Focuses on the systematic study of natural processes and mechanisms associated with the GYA. Emphasis is placed on the biological and physical (chemistry, earth, and physics) science concepts that have formed the parks that exist today. Consequences of human intervention are addressed. Applications of science content to K-12 classroom curricula are addressed. Required field trip to the GYA.

SMED 5013* Mathematics Education: Theory and Practice (Grades 1-4). Prerequisite(s): MATH 3403 and MATH 3603, Admission to MAT, Full admission to Professional Education. Curriculum, materials, methods, and procedures related to the theory and practices of teaching mathematics in grades 1-4. Meets with SMED 3153. No degree credit for those with credit in SMED 3153.

SMED 5050* Seminar in Integrated Mathematics and Science Applications. 1-6 credits, max 6. Seminar topics may differ depending upon the nature of current interests and topics in mathematics and science education.


SMED 5113* Knowing and Learning in Mathematics and Science. Prerequisite(s): Admission to MAT program or consent of instructor. Expands the prospective teacher’s understanding of current theories of learning and conceptual development. Students examine their own assumptions about learning and what it means to teach. They critically examine the needs of a diverse student population in the classroom. Meets with SMED 3013. No degree credit for those with credit in SMED 3013.

SMED 5123* Classroom Interactions in Mathematics and Science. Prerequisite(s): SMED 5113 and Admission to MAT program or consent of instructor. A close examination of the interplay between teachers, students, and content, and how such interactions enable students to develop deep conceptual understanding. Students learn how content and pedagogy combine to make effective teaching. Includes a school-based field experience. Meets with SMED 4013. No degree credit for those with credit in SMED 4013.

SMED 5133* Problem-Based Learning in Mathematics and Science. Prerequisite(s): SMED 5113 and Admission to MAT program or consent of instructor. Explores authentic, important, and meaningful questions of real concern to students. Students will work in teams to formulate questions, make predictions, design investigations, collect and analyze data, make products and share ideas. Includes a school-based field experience. Meets with SMED 4023. No degree credit for those with credit in SMED 4023.

SMED 5223* Teaching Science in the Schools. Materials, methods and classroom procedures related to science in grades K-12.

SMED 5243* Environmental Education in the Curriculum. Integration
of environmental concepts in the total school curriculum. Review of P-12 environmental education curricula and methods of teaching environmental education in formal and nonformal settings.

SMED 5253* Rational Number Concepts, Proportional Reasoning, and Classroom Interactions at the Elementary Level (PK-6). Prerequisite(s): completion of a Bachelor’s degree. Focus on teaching rational number concepts and developing proportional reasoning skills for PK-6 classrooms; attention is also given to learning methods which facilitate appropriate classroom interactions.

SMED 5263* Assessment and Evaluation in School Mathematics. Focus on classroom assessment to help teachers identify what students know about critical mathematics concepts, skills, procedures, and facts. Emphasis would be on using that information to inform their instructional decisions and enhance student learning.

SMED 5270* Practicum in School Mathematics. 1-3 credits, max 6. 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.

SMED 5273* Number Concepts and Assessment at the Elementary Level (PK-6). Analysis and construction of effective mathematical tasks in teaching number systems and operations at the PK-6 level; attention is also given to the expansion of content knowledge and issues related to assessment.

SMED 5280* Workshop in Science Education. Develops and/or implements elementary and secondary science programs.

SMED 5283* Problem-Centered Learning in Mathematics. Focus on the different aspects of a problem-centered learning environment. Using current research as a foundation, students will examine tasks, collaborative work, and the roles of teachers, students and discourse.

SMED 5293* Teaching and Learning Mathematics in Technology. The focus of this course is on research and methods of teaching and learning with technology in the mathematics classroom. Topics will include philosophical, social, developmental, and theoretical issues associated with the development and use of technology and school reform. Activities and applications will be explored as they relate to the potential for providing a technology-rich learning environment conducive to student construction of mathematical knowledge.

SMED 5613* Effective Teaching of Mathematics in the Secondary School. Prerequisite(s): 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.

SMED 5750* Seminar in Mathematics Education. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Problems, issues and trends in mathematics education.

SMED 5913* Geometry, Spatial Visualization, and Learning Trajectories at the Elementary Level (PK-8). Prerequisite(s): Completion of a Bachelor’s degree. Focus on geometric concept development at the PK-6 level and an understanding of spatial visualization. Attention will be given to the understanding of learning trajectories for elementary grades mathematics learning.

SMED 5923* Algebra and Mathematical Tasks at the Elementary Level (PK-6). Prerequisite(s): Consent of instructor. Directed advanced practicum in PK-6 level algebra concepts of functional thinking and generalized arithmetic. Attention will be given to the analysis and construction of effective mathematical tasks in the teaching of algebra.

SMED 5933* Teaching Measurement and Data at the Elementary Level (PK-6). Prerequisite(s): Completion of a Bachelor’s degree. Focus on statistical literacy of elementary teachers and the teaching of data analysis and measurement to PK-6 students; emphasis on the use of instructional technology to enhance student learning.

SMED 5943* Mathematics Leadership and Coaching. Prerequisite(s): Completion of a Bachelor’s degree and nine hours from SMED 5273, SMED 5913, SMED 5923, and SMED 5933. Develops skills and knowledge for school mathematics program design and leadership, and for coaching other teaching professionals in mathematics teaching.

SMED 6123* Teaching the Nature of Science in Secondary Science Education. Prerequisite(s): Successful completion of a bachelor’s degree. Guided readings, discussions, and group activities focus on strengthening views on the nature of science.

SMED 6223* Instruction and Learning in Science and Mathematics Education. Prerequisite(s): Acceptance into a doctoral program. Focus on learning and teaching in science and mathematics education contexts. Students will synthesize research in science and mathematics education that are related to the learning sciences.

SMED 6750* Research in Mathematics and Science Education. 1-6 credits, max 6. The examination of current research in mathematics and science learning and teaching research designs, employed, and the generation of new hypotheses.

Social Foundations (SCFD)

SCFD 3223 (D) Role of Teacher in American Schools. An introduction for those students wishing to pursue the teaching profession. An overview of teaching and policy in American schools and background in history, theory, and philosophy of education. Topics to be addressed include: diversity in schools; school governance; funding and organization; ethics and professionalism; curriculum; legal issues; pedagogy and current issues in education.

SCFD 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.

SCFD 4913 (I) International Issues and the Role of the School. International issues that shape educational perspectives and practices locally and globally. Consideration of major issues in education, such as the effects of globalization, the purpose of and right to an education, gender, indigenous knowledge, and global citizenship.

SCFD 5000* Master’s Report or Thesis. 1-6 credits, max 6. 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.

SCFD 5223* Role of Teacher in American Schools. Prerequisite(s): Graduate level standing. An introduction for those students wishing to pursue the teaching profession. An overview of teaching and policy in American schools and background in history, theory, and philosophy of education.

SCFD 5720* Education Workshop. 1-8 credits, max 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.

SCFD 5850* Directed Study. 1-3 credits, max 3. Directed study for master’s level students.

SCFD 5873* Culture, Society and Education. Cultural assumptions, constructions and social practices in childhood and education in a variety of societies. Children’s family, community and school lives. Anthropological and comparative perspective.

SCFD 5883* Educational Sociology. The manner in which social forces and institutions influence education and the educational system in the United States.

SCFD 5913* Introduction to Qualitative Inquiry. Examination of the major approaches and fieldwork techniques of qualitative research as well as the challenges associated with conducting this form of inquiry.

SCFD 5923* Popular Culture and Education. Investigation and analysis of the ways popular culture socializes and educates young people in social and school norms. Considers connections among popular culture, youth identity, relationships, resistance and activism.

SCFD 5990* Problems and Issues in Social Foundations. 1-3 credits, max 3. In-depth exploration of a contemporary problem or issue in the social foundations of education.

SCFD 5998* Urban Education. Examines the historical, political, economic and sociocultural contexts of urban education as it pertains to students, teachers, administrators, and community members.


SCFD 6023* Comparative Education. A systematic investigation of educational institutions in various nations for the purpose of an enlarged, critical view of American education. Researching specific transnational educational theories.

SCFD 6113* Theoretical Foundations of Inquiry. Exploration of the history and philosophical assumptions underlying theories, methods and issues of ethics and rigor associated with both qualitative and quantitative research in education and related fields. An in-depth overview of research paradigms through readings and discussions. Foundational doctoral-level research course.

SCFD 6123* Qualitative Research I. Prerequisite(s): 6113 or consent of instructor. The traditions, philosophies, and techniques of qualitative research, including participant observation, interviewing and document analysis. Practice in qualitative techniques and in preliminary data analysis.

SCFD 6190* Qualitative Research: Selected Methods. 3 credits. Designing and conducting a limited study in order to get a “hands-on” feel for the focal method. Methods such as case study, grounded theory, ethnography, biography, historical social science, life history, phenomenology, and discourse analysis.

SCFD 6193* Qualitative Research II. Prerequisite(s): 6123, 6133 or consent of instructor. Various approaches to qualitative data analysis, including the use of computer applications. Additional attention to issues of writing, representation, reflexivity, and reciprocity. Practice in analytic techniques and writing research.

SCFD 6443* Ethics and Moral Education. Interdisciplinary perspective.
of traditional and contemporary ethical theories, focusing on application to professional practice and moral education. Moral development, the moral life, feminist ethics, and character education.

SCFD 6501* Curriculum and Social Foundations Doctoral Seminar I. Orientation to doctoral study primarily for students in the PhD program in Curriculum and Social Foundations.

SCFD 6511* Curriculum and Social Foundations Doctoral Seminar II. Orientation to the profession primarily for students in the PhD program in Curriculum and Social Foundations.

SCFD 6630* Topics in Philosophy Education. 3-6 credits, max 6. Consideration of topic or topics (e.g. childhood and modern subjectivity) that are of great concern to the field of philosophy of education.

SCFD 6823* History of Education. History of elementary, secondary, and higher education with emphasis on Western society and the American schools. Discussion of historiography and historical methods with research emphasis on the impact of institutional development in a pluralistic society.

SCFD 6850* Directed Reading. 1-6 credits, max 6. Directed reading for students with advanced graduate standing to enhance students' understanding in areas where they wish additional knowledge.

SCFD 6853* Cultural Anthropology in Education. Understanding and critically reflecting on educational issues from a cultural anthropological perspective. Developing the knowledge and skills needed to understand cultural influences on teaching and learning.

SCFD 6860* Internship in Education. 1-8 credits, max 8. Directed off campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

SCFD 6883* Transforming Pedagogies. Contemporary pedagogical theories and school reform initiatives, including origins, purposes, underlying philosophical assumptions, cultural contexts, and implications for schooling.

SCFD 6910* Practicum. 1-6 credits, max 6. The student carries out an acceptable research problem (practicum) in a local school situation. Credit given upon completion of the written report.

SCFD 6983* Diversity and Equity Issues in Education. Many social, historical and cultural constructions of "difference" and the impact in personal and professional relationships in education and related human service fields. Categories of race, class, and gender, but may also include ethnicity, sexual orientation, and special needs.

SCFD 6990* Seminar in Social Foundations. 1-3 credits, max 9. In-depth seminar focusing on a contemporary problem or issue in the social foundations of education.

Sociology (SOC)

SOC 1113 (S) Introductory Sociology. Coming to terms with the requirements for living in a complex social world. Sociological concepts used to help students understand the social influences in day-to-day life.

SOC 2123 Social Problems. Exploration in selected social issues in contemporary American society, such as deviance, poverty, sexism, racism and ageism.

SOC 3113 Theoretical Thinking in Sociology. Prerequisite(s): Six credit hours of sociology, including 1113. Sociological theory in three broad areas: the emergence of social theory, the major schools of social theory and the relevance of theory to sociological research.

SOC 3133 (D,S) Racial and Ethnic Relations. The historical and sociological dimensions of race and ethnicity in global society and understanding of the controversies and conflicts that race and ethnicity have generated in the global experience.

SOC 3223 (S) Social Psychology. Social basis of personality development and behavior, including symbolic environment, self and group motivation, attitudes and opinions, and social roles.

SOC 3323 Collective Behavior and Social Movements. Analyzes panics, crazes, riots and social movements emphasizing institutional and social psychological origins and consequences.


SOC 3713 Religion, Culture and Society. Recommended: 1113, ANTH 2353, REL 1103. An introduction to the scientific study of religion. Religious activity in both tribal and technological societies studied in the light of contemporary interpretations of culture and of social behavior. (Same course as REL 3713)

SOC 3953 Applied Sociology. Prerequisite(s): Sociology majors or consent of instructor or adviser. Application of sociological theory and methods to various job situations. Preparation for field experience in a variety of work settings.

SOC 3993 (D,S) Sociology of Aging. Sociological problems of aging, including the analysis of the behavior of the aged within the framework of social institutions.

SOC 4023* Juvenile Corrections and Treatment Strategies. Prerequisite(s): 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.

SOC 4033 (I,S) Comparative Perspectives of Criminal Justice Systems. Study of criminal justice systems in different nation states and culture context from a different comparative perspective.

SOC 4043 (D,S) Gender and Work. Prerequisite(s): One upper division course. Consideration of unpaid, paid and volunteer work and gender differences. Linkages between economy, work and family with examples from United States and less developed countries.

SOC 4133 Social Research Methods. Prerequisite(s): 1113 and 3113. 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.

SOC 4153 Sociology of Health and Illness. Critically analyzes the social processes of disease and illness in modern society from a sociological perspective. Studies the social organization of Medicare care, including critical issues affecting healthcare and health insurance in the United States. Focuses on the meanings and experiences of illness, as well as on contemporary critical debates such as environmental and health, bioengineering, and bioethics.

SOC 4213 (S) Sexuality in American Society. Prerequisite(s): Junior standing or consent of instructor. Sociological aspects of sexual behavior, attitudes and belief systems in society. Similarities and differences in males and females in all types of sexuality.

SOC 4243 Quantitative Methods in Sociology. Prerequisite(s): 1113, 3113, 4113. Strategies and procedures in the analysis of quantitative sociological data, including the use of statistical computer programs.

SOC 4313 Sociology of Law and Punishment. Focus on issues concerning the relationship between law, punishment and society. Examines both classical and contemporary sociological and legal scholars. Current penal policies will be examined as well.


SOC 4383 (S) Social Stratification. Systems of class and caste, with special attention to the United States. Status, occupation, income, and other elements in stratification.

SOC 4433 (S) Environmental Sociology. Critical assessment of the social causes and consequences of problems with resource scarcity and environmental degradation. Environmental problems viewed as social problems, requiring an understanding of the structural conditions producing environmental problems and inhibiting resolutions.

SOC 4443 Sociology of Law and Legal Institutions. Prerequisite(s): 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, case loads, and related areas. Native American law; federal policy and trust status, criminal and civil law, tribal jurisdiction, tribal courts.

SOC 4453 (S) Environmental Inequality. Prerequisite(s): 1113. Considers the connection between environmental problems and race/ethnicity and class inequality. Focuses on environmental justice/inequality, social movements, health, policy and risk at the local, national and global levels.

SOC 4463 Technology and Society. Exploration of various aspects of the relationship between society and technology. Analysis of arguments about the role of technology in society. Examination of the social contexts within which technology is created and discussion of the mechanisms and processes through which technology is embraced or discarded, such as peer review, politics, religion, and legal frameworks.

SOC 4473 Oklahoma Environmental Sociology. Critical assessment of the social causes and consequences of environmental problems in Oklahoma, both historical and contemporary. Examines the Land Run, the Dust Bowl, the Oil Boom, land ownership and use patterns.

SOC 4533 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.

SOC 4573 Victimology. This course combines various academic disciplines to introduce the field of Victimology. The course represents an overview of the Victimology field; courts, victim services, victimization, and personnel
issues. Students use the on-line and reading material to build a framework for understanding the field of victimology together with victim issues and career opportunities. Same course as PSYC 4573.

SOC 4643 (S) Sociology of Gender. Explores the social organization of gender from diverse theoretical and empirical perspectives using a global experience.

SOC 4653 (I,S) Gender and the Middle East. An overview of gender-related issues in the Middle East as North African countries is provided to bridge cultures and build understanding. Specific attention is given to issues of women and how they are connected to changes in culture, economics, politics and society.

SOC 4663 Undergraduate Capstone Seminar in Sociology. Prerequisite(s): Majors; senior standing; 3113, 4133, 4243. Concluding course for Sociology majors. Application of the skills, knowledge and expertise acquired in Sociology, including critical thinking, writing, theory, and methods.

SOC 4723 (S) American Marriage, Family and Male-Female Relationships. The sociological relationship between marriage and family and other social structures and systems, especially work and the economy. Male and female roles and relationships in mate selection, sexuality, marriage, divorce, and other intimate situations.

SOC 4733 Criminal Behavior Analysis. Prerequisite(s): 3523 or 4333. This course combines various academic disciplines toward a behavioral examination of the violent offender. By examining the crime scene from a behavioral perspective, the psychodynamics of the offender, the sociological forces, and the social psychological dimensions of victim-offender interactions are combined for a more holistic understanding of the violent offender.

SOC 4743 Criminalistics: Introduction to Forensic Sciences. Prerequisite(s): 3523 or 4333. Criminalistics or forensic sciences involve the application of physical and behavioral sciences to social order or more specifically, the relationship between science and law. This course introduces the student to the various aspects of forensic examination of the violent offender. By examining modern techniques of crime scene analysis, the student learns how theory and technological development impact our social concepts of law and justice.

SOC 4753 Advanced Forensics. Prerequisite(s): 3523 or 4333 and 4743. Forensic sciences involve the application of physical and behavioral sciences to social order and law. This course advances students' understanding of examinations of violent criminal behavior. Students gain an awareness of the interdependent relationships of various physical and social science disciplines and how these issues are operationalized at an actual crime scene.

SOC 4850 Internship in Sociology. 1-4 credits, max 4. Prerequisite(s): 3952, completion of 12 hours of sociology, or consent of internship coordinator. Field experience in a variety of work settings.

SOC 4923 Sociology of Punishment. An overview of correctional work focusing on parole, probation and institutions. A survey of contemporary alternatives to conventional imprisonments.

SOC 4950 Current Topics in Sociology. 1-12 credits, max 12. Special topics in sociology to be taken from semester to semester.

SOC 4990* Exploration of Sociological Issues. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Examines sociologically significant topics and issues.

SOC 4993 Senior Honors Thesis. Prerequisite(s): 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 sociology.

SOC 5000* Thesis in Sociology. 1-6 credits, max 6.

SOC 5001* Graduate Proseminar. Prerequisite(s): Admission to Sociology graduate program. Introduction and orientation to the graduate program in the Department of Sociology.

SOC 5013 Creative Component in Sociology. A guided course serving as the final requirement for graduate students in the Department of Sociology's Master of Science degree, non-thesis option.

SOC 5063* Seminar in Social Inequality and Stratification. Prerequisite(s): Graduate standing. Provides comprehensive overview and analysis of theories and research in social inequality and stratification. Includes: study of classical and contemporary theories, development of research in the field, dynamics of inequalities and current and future perspectives.

SOC 5113* Classical Sociological Theory. Prerequisite(s): 3113 or equivalent. Major trends in sociological thought. The emergence of sociological theory in Europe and America.

SOC 5123* Contemporary Sociological Theory. Prerequisite(s): 3113 or equivalent. Critical examination of significant theoretical formulations, 1920 to the present. Relation between theoretical development and current research emphasis.

SOC 5213* Techniques of Population Analysis. Prerequisite(s): Graduate standing. Examination of primary techniques and statistics employed in studies of population characteristics. Examination of sources of demographic data, methods employed in the collection and analysis of data on population characteristics, composition and change.

SOC 5223* Culture, History and World Systems. Prerequisite(s): Admission to Graduate College and international studies program. The modern world-system and its new social formations resulting from increasing globalization. Examination of cultural, socio-economic, and political changes in developed and developing societies. Modern societies, their historical developments, the cultural politics of difference, and the re-emergence of ethnic groups worldwide. Existing theoretical models of change for profit and non-profit organizations. (Same course as INTL 5223)

SOC 5243* Social Research Design. Prerequisite(s): 3113, 4133 or equivalent; graduate standing. Techniques in design, data collection, and interpretation of data for sociological research.

SOC 5263* Quantitative Analysis of Social Research. Prerequisite(s): 3113, 4133 or equivalent; graduate standing. Advanced techniques in sociological research and data analysis focusing on the formulation of substantive research questions and application of a variety of research procedures to answer such questions.

SOC 5273* Qualitative Research Methods. Examination of ethnographic studies and implementation issues connected with qualitative research. Research project required.

SOC 5283* Advanced Qualitative Sociological Research. Prerequisite(s): Graduate standing. Study of research design and implementation issues in advanced qualitative research in sociology. Requires students to design and implement their own qualitative sociological research projects under the guidance of the instructor.

SOC 5323* Seminar on Collective Behavior and Social Movements. Prerequisite(s): Graduate standing. Examination of major theoretical and empirical approaches employed in the study of social movements. Examination of problems of social movements and social movements including individual versus group approaches. Grassroots movements, community organizing, political conflicts, and revolutions.

SOC 5333* Global Population and Social Problems. Prerequisite(s): Graduate standing. Study in world, regional and national population and social problems. Modern societies, their historical developments and interdependent relationships of various physical and social science disciplines and how these issues are operationalized at an actual crime scene.

SOC 5343* Sociology of Law and Punishment. Advanced study in the sociology of law and punishment. Focus on both classical and contemporary sociological and legal research. An interdisciplinary and comparative approach is also emphasized.

SOC 5463* Seminar in Environmental Sociology. Critical overview of contemporary developments in environmental sociology. Environment concern, disasters, health issues, risk assessment, and environmental conflict.

SOC 5473* Seminar on the Contemporary Environmental Movement. Critical overview of contemporary theory and research on the environmental movement. Analysis of crucial movements dynamics, including historical development, central organizing themes, strategies and tactics, and movement activities, environmental health movements, and transnational movement campaigns.

SOC 5493* Seminar in Environmental Justice. Considers racial, class and equity implications of environmental degradation and regulation. Includes discussion of controversies over the siting of hazardous facilities in urban and rural areas, the extraction of resources from native lands, national and transnational export of toxic waste to the South and the development of a distinct environmental justice movement.

SOC 5553* Seminar in Medical Sociology. Advanced study in the sociology of medicine, including the doctor-patient relationship, the social meanings of health and illness, epidemiology, health care delivery, and the medicalization of American society. Analysis of the sociology of occupational health and mental illness using readings from both classical and contemporary sources.

SOC 5573* Seminar on Victimology. Critical overview of contemporary theory and research on victimology. Relationships between victim and offenders, social institutions such as media, police, business, advocacy groups, and various social movements.

SOC 5583* Comparative Criminal Justice Systems. Examines crime and criminal justice in a global world. Compares and contrasts major legal traditions with the U.S. criminal justice system.

SOC 5593* Seminar on Organization and Administration in Law Enforcement and Society. Critical overview of contemporary theory and research on administration in law enforcement and society.

SOC 5653* Gender and the Middle East. An overview of gender-related issues in the Middle East and North African countries. Existing theoretical models of change for profit and non-profit organizations. Specific attention is given to issues of women and how they are connected to changes in contemporary culture, economics, politics, and society.

SOC 5663* American Pluralism, Race and Ethnicity in American Life.
SOG 5763* Contemporary Organizational Theory. Prerequisite(s): Graduate standing. Advanced study of contemporary theories used to explain, predict and understand organizations. Behavior of populations of organizations.

SOG 5793* Seminar on Organizational Deviance. Overview of contemporary theory and research on organizational deviance. Defining acceptable risk. Organizational structures, processes, and standard operating procedures that produce mistake, misconduct and disaster.

SOG 5813* Myths and Realities of Organizational Change. Prerequisite(s): Graduate standing. A critical examination of the various theories and models that address change and improvement processes in complex organizations. Theoretical and methodological validity of assumptions underlying such organizational theories and models.

SOG 5950* Seminar in Sociology. 1-3 credits, max 25. Prerequisite(s): Graduate standing. Special seminar; topics vary from semester to semester.

SOG 5980* Internship. 1-6 credits, max 6. Supervised field placement.

SOG 5990* Advanced Problems and Issues in Sociology. 1-9 credits, max 9. Prerequisite(s): Consent of instructor. Group enrollment or individual research enrollment as needed. Graduate level analysis of special problems and issues in sociology not covered in other department offerings.

SOC 6000* Dissertation. 1-12 credits, max 24. Prerequisite(s): 2124 and PHYS 1225. Chemical and colloidal properties of clays and organic matter. Analysis/evaluation of land use decisions related to agricultural, engineering and environmental concerns. Soil formation, classification and conservation. Analysis/evaluation of soils in field and laboratory settings.

SOC 4463* Soil and Water Conservation. Prerequisite(s): Consent of instructor. An overview of microorganisms living in the soil and their activities which are significant to agricultural practices and the environment. No credit for both 4483 and 5583.

SOC 4470* Problems and Special Study. 1-3 credits, max 12. Prerequisite(s): Consent of the instructor. Problems in soil science selected from topics in soil chemistry and fertility, soil physics, soil biology, soil conservation, and soil morphology.

SOC 4483* Soil Microbiology. Prerequisite(s): 2124 and BIOL 1114 or consent of instructor. An overview of soil microbiology and the role of microorganisms in the soil and their activities which are significant to agricultural practices and the environment. No credit for both 4483 and 5583.

SOC 4683* Soil, Water and Weather. Prerequisite(s): 2124 and PHYS 1114. Introduction to the physics of the soil-plant-atmosphere continuum. A focus on physical properties of soil and interactions with water and weather in terrestrial ecosystems.

SOC 4893* Soil Chemistry and Environmental Quality. Prerequisite(s): 2124 and CHEM 1225. Chemical and colloidal properties of clays and organic matter in soil systems, including iron oxide, retention, and precipitation; soil acidity and salinity; mineral weathering and formation; oxidation-reduction reactions; trace and toxic elements, water quality, land application of wastes, and soil remediation.

SOC 5000* Master's Thesis. 1-6 credits, 6 max total credits under Plan I, and 2 max total credits under Plan II. Prerequisite(s): Consent of adviser. Research planned, conducted and reported in consultation with a major professor.

SOC 5020* Graduate Seminar. 1 credit, max 3. Prerequisite(s): Graduate standing. Discussions of research philosophy, methods, interpretation, and presentations. Profession development and contributions to the scientific community. (Same course as PLNT 5020)

SOC 5110* Problems and Special Study. 1-4 credits, max 12. Prerequisite(s): Consent of instructor. Supervised study of special problems and topics not covered in other graduate courses.

SOC 5112* Research Methods in Plant and Soil Sciences. Prerequisite(s): Graduate standing. Exploration of various methodologies helpful in field scale research. Application and understanding of experimental design and statistical analysis.

SOC 5151* Professional Development Colloquium in Plant and Soil Sciences. Professional preparation of graduate students for future careers. Discussions on topics related to the application process and successful careers in the academic, private industry and government sectors. Concerns of international students, career-life balance and other post-graduate school career issues are discussed.
SOIL 5233* Soil Chemical Processes and Impact on Environmental Quality. Prerequisite(s): 4893 and CHEM 2113 or CHEM 3324 or equivalent. A comprehensive study of chemical processes applied to fate and transport of contaminants and agricultural productivity. Chemical and physical properties of soil minerals as they pertain to solution and surface chemistry. Nutrient and contaminant availability and speciation as dictated by ion exchange, precipitation/dissolution, and adsorption reactions. Review of current research in soil and environmental chemistry literature.

SOIL 5230* Research. 1-4 credits, max 8. Prerequisite(s): Consent of a faculty member supervising the research. Supervised independent research on selected topics.

SOIL 5353* Advanced Soil Genesis and Classification. Lab 2. Prerequisite(s): 3433. Processes and factors of soil formation. Comparison of world soil morphology and classification systems.

SOIL 5383* Advanced Soil Microbiology. Prerequisite(s): 2124 and BIOL 1114 or consent of instructor. A comprehensive overview of microorganisms living in the soil and their activities which are of agricultural and environmental significance. Provide experience in analytical skills related to soil microbial processes. No credit for both SOIL 4483 and 5383.

SOIL 5483* Soil Biodegradation and Bioremediation. Prerequisite(s): 4483. A comprehensive overview of microorganisms living in soil and their activities of agricultural and environmental significance, emphasizing their roles in improving soil quality, and biodegradation and bioremediation of soil.

SOIL 5583* Soil Physics Measurement Techniques. Lab 2. Prerequisite(s): 4683. Training in field and laboratory techniques for physical analysis of soil properties and processes. Develop research proposal and conduct research project related to soil physics.

SOIL 5813* Soil-Plant Nutrient Cycling and Environmental Quality. Prerequisite(s): 4234 or equivalent. Theory and application of soil plant relationships in production and non-production environments. Nutrient cycling, mass balance, soil nutrient supply and plant response. Methods to reduce the impact of nutrients on environmental quality, soil-plant buffering and response models.

SOIL 6000* Doctoral Thesis. 1-6 credits, max 36. Prerequisite(s): Consent of instructor. Independent research to be conducted and reported with the supervision of a major professor as partial requirement for the PhD degree.

SOIL 6010* Advanced Topics and Conference. 1-6 credits, max 12. Prerequisite(s): Consent of instructor. Supervised study of advanced topics. A reading and conference course designed to acquaint the advanced student with fields not covered in other courses.

SOIL 6583* Soil Physics Theory. Prerequisite(s): 4683 or equivalent and MATH 2233 or equivalent. Theoretical understanding and modeling skills required to analyze and predict mass and energy transport in the soil-plant-atmosphere continuum. Application of analytical and numerical models for diverse transport phenomena including water, heat, and solute transport through soil.

Spanish (SPAN)

SPAN 1115 Elementary Spanish I. Pronunciation, conversation, grammar, and reading. Includes language lab work. Students may not receive credit for both this course and SPAN 1153. Not for native speakers per University Academic Regulation 4.9.

SPAN 1153 Accelerated Elementary Spanish I. Prerequisite(s): 1-2 years of high school Spanish or equivalent. Accelerated presentation of basic skills of the Spanish language for students with previous experience, but who are not yet ready for SPAN 1225. Students may not receive credit for both this course and SPAN 1115. Not for native speakers per University Academic Regulation 4.9.

SPAN 1225 Elementary Spanish II. Prerequisite(s): 1115 or equivalent. Continuation of 1115. Includes language lab work. No credit for students with credit in 1253. Not for native speakers per University Academic Regulation 4.9.

SPAN 1253 Accelerated Elementary Spanish II. Prerequisite(s): 3-4 years of high school Spanish or equivalent. Accelerated presentation of the second phase of Spanish language skills for students with previous experience, but who are not yet ready for SPAN 2115. No credit for students with credit in 1253. Not for native speakers per University Academic Regulation 4.9.

SPAN 2115 Intermediate Spanish I. Prerequisite(s): 1225 or equivalent. Further development of speaking, listening, reading, and writing skills along with short cultural and literary readings. Not for native speakers per University Academic Regulation 4.9.

SPAN 2232 Intermediate Reading and Conversation. Prerequisite(s): 2115 or equivalent. Skill consolidation with emphasis on short literature readings and conversation. May be taken concurrently with 2233. Not for native speakers per University Academic Regulation 4.9.

SPAN 2233 Intermediate Composition and Grammar. Prerequisite(s): 2115 or equivalent. Skill consolidation with emphasis on composition and grammar with some conversation. May be taken concurrently with 2232. Not for native speakers per University Academic Regulation 4.9.

SPAN 3053 Introduction to Hispanic Literary Studies. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Introduction to techniques of literary analysis and research in Spanish and to Hispanic literary history. Prerequisite for all advanced literature courses in Spanish.

SPAN 3163 Survey of Peninsular Literature I. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Development of literature in Spain from the medieval period to 1700.

SPAN 3173 Survey of Peninsular Literature II. Prerequisite(s): 20 hours of Spanish or the equivalent proficiency. Development of literature in Spain from 1700 to the present.

SPAN 3183 Latin American Survey I. Survey of Latin American literature in Spanish from the pre-Columbian era to the turn of the 20th century, including letters, chronicles, essays, poetry, drama and narrative.

SPAN 3193 Latin American Survey II. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Survey of 20th and 21st century Latin American literature in Spanish, including narrative, poetry, drama, and essays.

SPAN 3203 Advanced Conversation. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Practice in conversation skills, designed to bring students to a high level of proficiency in speaking and listening. Class conducted in Spanish.

SPAN 3213 Advanced Grammar and Composition. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Study of advanced grammar and stylistics with emphasis on composition skills, designed to bring students to a high level of proficiency in writing.

SPAN 3343 Spanish for Professional Purposes. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Development of spoken and written Spanish for use in business and professional contexts.

SPAN 3403 Introduction to Hispanic Linguistics. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Introduction to Hispanic linguistics, including historical linguistics, sociolinguistics, dialectology, and bilingualism.

SPAN 3463 Advanced Diction and Phonetics. Prerequisite(s): 20 hours of Spanish or equivalent proficiency. Practice in conversation skills, designed to bring students to a high level of proficiency in speaking and listening. Class conducted in Spanish.

SPAN 4123 Hispanic Poetry. Prerequisite(s): One 3000 level Spanish literature course. Detailed study of representative poetry from Spain or Latin America.

SPAN 4133 Hispanic Prose. Prerequisite(s): One 3000 level Spanish literature course. Detailed study of representative prose works from Spain or Latin America.

SPAN 4163 Don Quijote. Prerequisite(s): One 3000 level Spanish literature course. Seminar devoted to Cervantes' novel.

SPAN 4173 Hispanic Drama. Prerequisite(s): One 3000 level Spanish literature course. Detailed study of representative plays from Spain or Latin America.

SPAN 4183 Contemporary Hispanic Literature. Prerequisite(s): One 3000 level Spanish literature course. Study of Spanish and/or Latin American films from cultural, historical, and artistic perspectives.

SPAN 4223 Hispanic Film. Prerequisite(s): One 3000 level Spanish literature course. An in depth study of conflict and coexistence among Christian and Islamic cultures in Spain from the eighth century to the present day. The course includes both literary and historical readings.

SPAN 4193 Spanish and Islam. Prerequisite(s): One 3000 level Spanish literature course. An in depth study of conflict and coexistence among Christian and Islamic cultures in Spain from the eighth century to the present day. The course includes both literary and historical readings.

SPAN 4233 Spanish Peninsular Civilization. Prerequisite(s): 23 hours of Spanish or equivalent proficiency. Reading and discussion of selected texts outlining the development of contemporary Spanish Peninsular civilization.

SPAN 4333 Latin American Civilization. Prerequisite(s): 23 hours of Spanish or equivalent proficiency. Reading and discussion of selected texts outlining the development of contemporary Hispanic civilization outside the Iberian peninsula.

SPAN 4413 Advanced Stylistics. Prerequisite(s): 3213. Continuation of 3213, emphasizing further development of grammar and composition in a variety of contexts.

SPAN 4443 History of the Spanish Language. Prerequisite(s): 23 credit hours of Spanish or equivalent proficiency. The development of the Spanish language from its Latin root to the present day.

SPAN 4463 Hispanic Dialectology. Prerequisite(s): 23 credit hours of Spanish or equivalent proficiency. The development of the Spanish language from its Latin root to the present day.
Spanish or equivalent proficiency. Study of Spanish dialects world-wide, including phonetic/phonological, lexical, morphological, and syntactic characteristics. SPAN 4550 Seminar in Spanish. 1-3 credits, max. 9. Prerequisite(s): One 3000-level Spanish course, or equivalent. Readings and discussion of vital subjects in Spanish. SPAN 5110* Advanced Hispanic Studies. 1-3 credits, max. 9, Lab TBA. Prerequisite(s): 22 hours of Spanish or graduate standing in foreign language.

Special Education (SPED)

SPED 3202 (D) Educating Exceptional Learners. Lab 2. 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. SPED 4723* Transition Into Adulthood for Individuals with Disabilities. Strategies for preparing youth and young adults with disabilities for transitioning into adulthood. Students complete 20 hour field experience as part of the course. SPED 4753* Techniques of Behavior Management and Counseling with Exceptional Individuals. Techniques to develop and evaluate programs of behavior change for exceptional students including counseling with the exceptional individual and conferencing with professionals and parents. SPED 5000* Master’s Thesis. 1-6 credits, max. 6. SPED 5123* Characteristics and Teaching Methods for Students with Autism Spectrum Disorders. Prerequisite(s): Graduate standing or permission of instructor. Designed to provide a foundation for understanding educational and psychological theory and best practices used in teaching students with Autism Spectrum Disorders (ASD). Characteristics and diagnostic procedures of ASD will be introduced, as well as such teaching methods as incidental teaching, visual supports, workstations, discrete trial teaching, and social stories. SPED 5150* Seminar in Special Education. 1-6 credits, max. 6. Seminar topics will differ depending on interests and topics regarding Special Education. SPED 5320* Seminar in Applied Behavioral Studies. 3-9 credits, max. 9. In-depth explorations of contemporary problems of applied behavior studies. SPED 5573* Communication Strategies for Individuals with Severe and Profound Disabilities. Methods for communicating with severely or profoundly disabled persons and for facilitating their communication through speech, sign, assistive devices and technology. SPED 5620* Practicum with Exceptional Learners. 1-8 credits, max. 8, Lab 1-6. Prerequisite(s): Consent of instructor. Supervised individual and group experience with exceptional learners. The particular experience (learning disability, mental retardation, gifted, etc.) determined by the student’s field of specialization. SPED 5623* Characteristics of Students with Mild/Moderate Disabilities. Educational, psychological and physiological characteristics of individuals with mild and moderate disabilities. Professional roles of the teacher, professional ethics, and assessment of children with disabilities. SPED 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 dealing with unique individual needs. SPED 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. SPED 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. SPED 5673* Improving Literacy Skills of Individuals with Disabilities. Normal language development and variations from norms demonstrated by exceptional learner. Assessment techniques and intervention strategies appropriate for exceptional infants and children; theoretical approaches to language training, formal and informal; assessment techniques and techniques for exceptional individuals. SPED 5683* Models of Instruction in the Inclusive Classroom. Current techniques, models and approaches used to teach students with mild, moderate disabilities and the theoretical bases for these techniques and approaches in inclusive classrooms will be presented. Students complete 20 hour field experience as part of the course. SPED 5733* Teaching Strategies for Students with Physical and Health Disabilities. Prerequisite(s): 5723 and graduate student standing. Design and implementation of educational programs, collaboration with families and other professionals, and advocacy for students with disabilities. SPED 5743* Planning and Instruction in Special Education. Knowledge and skills related to research-based, validated “best” practices for determining curriculum and implementing instruction for students with disabilities. Students complete 20 hour field experience as part of the course. SPED 5783* Assessing Students with Disabilities. The practice and practicality of the assessment process used in schools for students with disabilities. SPED 5833* Classroom and Behavior Management. Classroom and behavior management strategies designed to improve learning and behavior within instructional settings. Students complete 20 hour field experience as part of the course. SPED 5993* Culturally Responsive Teaching in Special Education. Examination of the influence of ethnicity, socioeconomic class, and gender factors on students with disabilities. Ethnographic inquiry through Service-Learning field placements for understanding cultural diversity and special education. Teaching attitudes and expectations, and curricular and instructional strategies for improving students’ school performance. SPED 6000* Doctoral Thesis. 1-25 credits, max. 25. Required of all candidates for doctorate in applied behavioral studies. Credit given upon completion and acceptance of thesis. SPED 6183* Legal Aspects in Special Education. 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. SPED 6543* School and Intergroup Collaboration. Prerequisite(s): Graduate student status or instructor permission. An advanced course to examine models for interdisciplinary teamwork in the design, delivery and evaluation of services for students with disabilities and at risk. Both school-based and intergroup collaborative services and strategies for communicating with multiple stakeholders are emphasized. SPED 6603* Current Trends and Issues in Special Education. Current research and literature regarding the education of exceptional children. SPED 6743* Single Subject Design in Special Education. Prerequisite(s): Permission of instructor. Conduct research utilizing single subject and single case study design with emphasis on special education. Advanced procedures in single subject research methodology, including design strategies and experimental control are emphasized. SPED 6850* Directed Reading. 1-6 credits, max. 6. Prerequisite(s): Consent of instructor. Directed reading for students with advanced graduate standing. SPED 6880* Internship in Education. 1-8 credits, max. 6, Lab 3-24. Directed off-campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

Speech Communication (SPCH)

SPCH 2713 (S) Introduction to Speech Communication. The practical and theoretical examination of the process of human communication involving a variety of contexts, including interpersonal relationships, small group discussions, and public speaking performances. SPCH 3703 Small Group Communication. General systems approach to small group processes. Special consideration given to group roles, norms, leadership and decision-making. Participation in various types of discussion groups. SPCH 3723 Business and Professional Communication. Oral communication encounters in business and professional settings. The interview, informative briefing, talking-paper, small group interaction and informative, integrative and persuasive speeches. SPCH 3733 (S) Elements of Persuasion. An examination of current theory and research relevant to the process of persuasion and social influence in interpersonal, small group, mass media, and public settings. Includes a discussion of the practical implications of effective and ineffective persuasive strategies. SPCH 3743 Advanced Public Speaking. The preparation and delivery of various types of public speeches. SPCH 3793* Communication in Interviews. General principles of interviewing. Specific guidelines for the interviewer in survey, journalistic, counseling, selection, appraisal, legal, medical, and sales interviews. SPCH 4010 Independent Study in Speech Communication. 1-3 credits, max. 3. Prerequisite(s): Consent of instructor. Supervised research projects in speech communication. SPCH 4710 Topics in Speech Communication. 1-3 credits, max. 6. Selected current topics in speech communication. SPCH 4743* Problems of Interpersonal Speech Communication. Application of communication theory in percep- tion to interactional and communication settings. Identification and management of barriers related to the concepts of perception, attraction, self-disclosure, listening and conflict.
SPCH 4753 (I) Intercultural Communication. Social and cultural differences between individuals from diverse backgrounds as possible barriers to effective communication.

SPCH 4763 Organizational Communication. The interface between communication theory and organizational structure. Nature of communication problems in organizations, strategies for overcoming such problems and the design of effective communication systems in organizational settings.

SPCH 4793 (S) Nonverbal Communication. The study of current theory and research relevant to nonverbal behavior in interpersonal and professional relationships. Includes an examination of various nonverbal codes (e.g., body language, facial expressions) and the functions of nonverbal behavior (e.g., emotional expression, deception).

Sports Media (SPM)

SPM 2843 Sports and the Media. Prerequisite(s): Departmental majors only. The introductory course for sports media majors. Sports is a major industry in the United States today, and this course is designed to study that industry and the opportunities for and responsibilities of the journalists who cover it. Topics covered include the evolution of the sports media, sports media relations, ethics and the sports media, racial and gender issues in sports and the media, and multimedia sports journalism in the 21st century.

SPM 3500 Sports Media Internship. 1-3 credits, max 6. Prerequisite(s): MMJ 3263 and MMJ 3153 or (SC 3353 and SC 3753) with a grade of “C” or better and consent of instructor; and pass proficiency review. Internship to practice sports media skills students who wish to increase communications experience beyond that available in the classroom.

SPM 3783 Sports Public Relations. Prerequisite(s): SPM 2843 and MC 2003 and MC 2023 and SC 2183 with a grade of “C” or better in each; and pass proficiency review. Provides an overview and introduction to the practice of public relations within the sport industry. The primary focus of the course is on the role of public relations in all aspects of sport, fundamentals of sport publicity and promotional campaigns.

SPM 3813 Sports Reporting Across the Media. Lab 2. Prerequisite(s): MC 2003 and MC 2023 with a grade of “C” or higher in both; and pass proficiency review. This course provides an introductory reporting course specific to aspiring professionals of major sectors of the sport media industry (i.e., television, internet sites, public relations, newspapers, radio, Twitter and magazines). Students learn the basics of game summaries, keeping accurate statistics, conducting interviews, structuring stories, incorporating quotes in sports media content, all while adhering to AP style and ethical standards of journalism and communications professionals.

SPM 3843 Contemporary Sports. Prerequisite(s): MC 2003 and MC 2023 with grade of “C” or better in each; and pass proficiency review. Contemporary Sports Media will examine ethical and cultural considerations of the sports media as they pertain to sports gambling, drugs in sports, athletes and crime, privacy of athletes, gender and race in sports, international sports, labor issues in sports, and how the Internet is changing sports coverage.

SPM 3853 Advanced Sports Writing. Lab 2. Prerequisite(s): SPM 2843 and SPM 3813 and MMJ 3263 with grade of “C” or better in each; and pass proficiency review. This course focuses on the practicing of sports writing and reporting, which includes a wide variety of writing and reporting assignments, leading to an emphasis on enterprise and investigative reporting, as well as long-form features. Final projects should be of such quality to serve as the lead products in individual student portfolios.

SPM 3863 Electronic Sports Reporting. Prerequisite(s): MMJ 3263 with a grade of “C” or better; MMJ 3153 or concurrent enrollment; and pass proficiency review. Introduces students to various types of radio and television sports stories in the media. Students will learn to write in the aural style for broadcast/Web cast format. The course will emphasize other performance situations, such as producing and anchoring radio and television sportscasts. Students will be graded based on a combination of projects and testing.

SPM 4053 Sports Announcing. Prerequisite(s): MMJ 3153 and SPM 3863 with a grade of “C” or better or concurrent enrollment in both; and pass proficiency review. Focuses on the theory and practice of electronic sports media coverage, with an emphasis on the role, skills and practices of radio and TV sports announcers and electronic sports media journalism. The class includes play-by-play broadcasts and a class project.

SPM 4560 Specialized Sports Media Applications. 3 credits, max 6. Prerequisite(s): SPM 2843 and MMJ 3263 and MMJ 3913 with grade of “C” or better; and pass proficiency review. Professional sports media at an advanced level. Special topics in areas such as sports media production, announcing, performance, sports feature, column and editorial writing. Course content varies by semester. No credit for students in SC 5560 during same semester or with same subtitle.

SPM 4813 Sports Media Production. Lab 2. Prerequisite(s): SPM 2843 and MMJ 3263 and MMJ 3913 with a grade of “C” or better; and pass proficiency review. After completing this course students will be able to develop, write, pre-produce, produce, perform as talent and post-produce programming for broadcast sports media. By becoming proficient with specific production and performance techniques, you will be qualified to pursue an internship and/or employment with a media organization.

SPM 4883 Sports in the Newsroom. Lab 2. Prerequisite(s): SPM 3863 and either SPM 3853 or SPM 4813 each with a grade of “C” or better; and pass proficiency review. Capstone course for multimedia sports majors, giving them the opportunity to apply the skills they have learned to a final project that will be coordinated with a media outlet with the goal of publication. In addition, students will work on writing for print and electronic media, multimedia sports programming, management skills, and ethics and cultural issues in sports media.

SPM 4933 Advanced Sports Public Relations. Prerequisite(s): SC 3783 and SC 3953 and SC 3553 with “C” or better in each; and pass proficiency review. Capstone course providing a study of relevant issues practitioners face in today’s sports industry. Covers the scope and effect of sports on society and culture.

Statistics (STAT)

STAT 2013 (A) Elementary Statistics. Prerequisite(s): MATH 1483 or MATH 1513, each with a grade of “C” or better; or an acceptable placement score (see placement.okstate.edu). An introductory course in the theory and methods of statistics. Descriptive measures, elementary probability, sampling, estimation, hypothesis testing, correlation and regression. No degree credit for students with credit in STAT 2023 or STAT 2053.

STAT 2023 (A) Elementary Statistics for Business and Economics. Prerequisite(s): MATH 1483 or MATH 1513, each with a grade of “C” or better; or an acceptable placement score (see placement.okstate.edu). Basic statistical course for undergraduate business majors. Emphasis on basic probability, discrete and continuous distributions, point and interval estimation, hypothesis testing, correlation and simple linear regression. No degree credit for students with credit in STAT 2013 or STAT 2053.

STAT 2053 (A) Elementary Statistics for the Social Sciences. Prerequisite(s): MATH 1483 or MATH 1513, each with a grade of “C” or better; or an acceptable placement score (see placement.okstate.edu). No credit for business majors. An introductory course in the theory and methods of statistics. Descriptive measures, elementary probability, sampling, estimation, hypothesis testing, correlation and regression. No degree credit for students with credit in STAT 2013 or STAT 2023.

STAT 2331 SAS Programming. Prerequisite(s): A different programming language or consent of instructor. SAS as a general purpose programming language, data representation, input/output, use of built-in procedures, report generation.

STAT 3013 Intermediate Statistical Analysis. Prerequisite(s): 2013, 2023 or 2053. Applications of elementary statistics, introductory experimental design, introduction to the analysis of variance, simple and multiple linear regression, nonparametric statistics, survey sampling and time series. Data analysis using Excel included.

STAT 4013 (A) Statistical Methods I. Prerequisite(s): 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 one way, a two-way crossed, or in a two-fold nested classification. No degree credit for students with credit in STAT 4063.

STAT 4023 Statistical Methods II. Prerequisite(s): 3013 or 4013 or 4033 or 4053. 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. No degree credit for students with credit in 4063.

STAT 4033 Engineering Statistics. Prerequisite(s): MATH 2133 or MATH 2163. Probability, random variables, probability distributions, estimation, confidence intervals, hypothesis testing, linear regression. No degree credit for students with credit in 4063.

STAT 4043* Applied Regression Analysis. Prerequisite(s): One of 4013, 4033, 4053, 5013 or equivalent. Matrix algebra, simple linear regression, residual analysis techniques, multiple regression, dummy variables.

STAT 4053 (A) Statistical Methods I for the Social Sciences. Prerequisite(s): MATH 1513 with a grade of “C” or better; or an acceptable placement score (see placement.okstate.edu). Basic experimental statistics, basic probability distributions, methods of estimation, tests of significance, linear regression, calculation and analysis of variance for one and two-way classifications. No degree credit for students with credit in STAT 4013.

STAT 4063* Statistical Methods II for the Social Sciences. Prerequisite(s): 3013 or 4013 or 4033 or 4053. Basic concepts of experimental design. Analysis of variance, covariance, split-plot design. Factorial arrangements of treatments, multiple and curvilinear regression, enumeration data. No degree credit for students with credit in 4023.

STAT 4073 Engineering Statistics with Design of Experiments. Prerequisite(s): MATH 2163. Random variables and basic probability distributions, estimation, confidence intervals, hypothesis testing, basic analysis of variance, factorial arrangement of treatments and fractional factorial experiments, elementary quality control. No degree credit for students with credit in STAT 4033.
STAT 4091* SAS Programming. Prerequisite(s): 4013 or equivalent. SAS dataset construction, elementary statistical analysis, and use of statistics and graphics procedures available in SAS. No credit for students with credit in 5091.

STAT 4203* Mathematical Statistics I. Prerequisite(s): MATH 2163 with a grade of “C” or better. 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.

STAT 4213* Mathematical Statistics II. Prerequisite(s): 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.

STAT 4463* Multivariate Methods. Prerequisite(s): STAT 4043 and (STAT 4023 or STAT 5023). Use of Hotelling’s T-squared statistic, multivariate analysis of variance, canonical correlation, principal components, factor analysis and linear discriminate functions. No credit for students with credit in STAT 5063.

STAT 4910* Special Studies. 1-6 credits, max 6. Prerequisite(s): Consent of instructor. Subject specials in statistics.

STAT 4981* Statistics Capstone I Prerequisite(s): STAT 4203, 4043, 4091 and 4203 or concurrent enrollment. Information and preparation for graduate school for statistics undergraduates, communication skills for collaborating with scientists, introduction to research in statistics.

STAT 4991 Statistics Capstone II Prerequisite(s): STAT 4203, STAT 4043, STAT 4091 and STAT 4203 or concurrent enrollment. Career skills for statistics undergraduates entering the workforce, communication skills for collaborating with scientists.

STAT 4993 Senior Honors Project. Prerequisite(s): Departmental invitation, senior standing, Honors Program participation. A guided reading and research program ending with an honors project under the direction of a faculty member, with a second faculty reader and an oral examination. Required for graduation with departmental honors in statistics.

STAT 5000* Master’s Research. 1-6 credits, max 6. Prerequisite(s): Consent of advisory committee. Methods of research and supervised thesis or report.

STAT 5003* Statistics for Medical Residents. Prerequisite(s): Employed as a medical or veterinary resident or permission of instructor. Survey of statistical methodology relevant to health care professionals. Basic understanding of statistics presented in recent medical literature. Hypothesis testing, ANOVA techniques, regression, categorical techniques. (Same as course BIOM 5003).

STAT 5013* Statistics for Experimenters I. Prerequisite(s): Graduate standing and MATH 1513. Introductory statistics course for graduate students. Descriptive statistics, basic probability, estimation, hypothesis testing, p-values, analysis of variance, multiple comparisons, correlation and linear regression, categorical data analysis.

STAT 5023* Statistics for Experimenters II. Prerequisite(s): Graduate standing and STAT 4023 or STAT 5013. Analysis of variance, contrasts and multiple comparisons, factorial experiments, variance components and their estimation, completely randomized, randomized block and Latin square designs, split plot experiments.

STAT 5033* Nonparametric Methods. Prerequisite(s): One of 4023, 4043, 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.

STAT 5043* Sample Survey Designs. Prerequisite(s): One of 4013, 4033, 5013 or consent of instructor. Constructing and analyzing personal, telephone and mail surveys. Descriptive surveys including simple random, stratified random, cluster design, frame construction, non-probability samples, use of random number tables, sample size estimation and other topics related to practical conduct of surveys.

STAT 5053* Time Series Analysis. Prerequisite(s): STAT 4043. An applied approach to the analysis of time series in the time domain. Trends, autocorrelation, random walk, seasonality, stationarity, autoregressive integrated moving average (ARIMA) processes, Box-Jenkins method, forecasting.

STAT 5063* Multivariate Methods. Prerequisite(s): STAT 4043 and (STAT 4023 or STAT 5023). Use of Hotelling’s T-squared statistic, multivariate analysis of variance, canonical correlation, principal components, factor analysis and linear discriminate functions. Same course as STAT 4463.

STAT 5073* Categorical Data Analysis. Prerequisite(s): 5223, 5023 or equivalent or concurrent enrollment. Analysis of data involving variables of a categorical nature. Contingency tables, exact tests, binary response models, log-linear models, analyses involving ordinal variables, multinomial response models. Computer usage for analysis is discussed.

STAT 5083 Statistics for Biomedical Researchers. Prerequisite(s): STAT 5013. Analysis of variance, experimental designs pertaining to medical research, regression and data modeling, categorical techniques and the evaluation of diagnostic tests. No credit for students with credit in STAT 5023.

STAT 5091* SAS Programming. Prerequisite(s): 5013 or equivalent. SAS dataset construction, elementary statistical analysis, and use of statistics and graphics procedures available in SAS. No credit for students with credit in 4091.

STAT 5093* Statistical Computing. Prerequisite(s): 5213 or 4203, 5013 or equivalent. CS 1113 or equivalent. Random variable generation; numerical calculations of maximum likelihood estimators, quasi-likelihood estimators, probabilities, and quantities; computer intensive exact tests and distributions; randomized tests; bootstrap and jack knife methods, Monte Carlo simulations Monte Carlo Chain Monte Carlo methods for Bayesian estimation.

STAT 5123* Probability Theory. Prerequisite(s): MATH 2163 and one other course in MATH that has either 2144 or 2153 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.

STAT 5133* Stochastic Processes. Prerequisite(s): 5123 and MATH 2233, MATH 3013. Definition of a stochastic process, probability structure, mean and covariance function, the set of sample functions, stationary processes and their spectral analyses, renewal processes, counting processes, discrete and continuous Markov chains, birth and death processes, exponential model, queuing theory. (Same course as IEM 5133 & MATH 5133).

STAT 5213* Bayesian Decision Theory. Prerequisite(s): STAT 5223. Statistical spaces, decision spaces, loss and risk, minimum risk decisions, conjugate families of distributions, Bayesian decisions.

STAT 5223* Statistical Inference. Prerequisite(s): STAT 5213 and MATH 3013. Sampling distributions, point estimation, maximum likelihood methods, Rao-Cramer inequality, confidence intervals, hypothesis testing, sufficiency, completeness.

STAT 5303* Experimental Design. Prerequisite(s): STAT 5023 or STAT 4023 with consent of instructor. Review of basic concepts, interpretation of main effects and interactions in multi-factor designs, multiple comparisons, split-unit experiments, complete and incomplete block designs, linear mixed models analysis (including repeated measures analysis), 2nd and 3rd factorial experiments, fractional factorial experiments, crossover designs.

STAT 5323* Theory of Linear Models I. Prerequisite(s): STAT 5223, MATH 3013, and one of STAT 4023 or STAT 5023. Matrix theory (generalized inverse, idempotent matrix, and non-negative matrix results), multivariate normal distribution, quadratic forms, chi-square distribution, general linear models, estimability, general hypothesis testing.

STAT 5333* Theory of Linear Models II. Prerequisite(s): STAT 5323. Maximum likelihood estimation; one-way and two-way ANOVA models, multiple comparisons, regression models, linear mixed models, variance component estimation.


STAT 5910* Seminar in Statistics. 1-6 credits, max 12. Prerequisite(s): Consent of instructor. Investigation of special problems in the theory and/or application of statistics using current techniques. Special studies for M.S. level students.

STAT 6000* Doctoral Dissertation. 2-10 credits, max 30. Prerequisite(s): Consent of advisory committee. Directed research culminating in the PhD thesis.

STAT 6010* Statistics Literature. Prerequisite(s): Consent of instructor. Published journal articles from statistics or related areas are discussed. Usually offered as STAT 6010 or STAT 6091.

STAT 6013* Genetic Statistics. Prerequisite(s): A one-year graduate level sequence in statistics or with the permission of the instructor. Course provides a statistical basis for modeling genetic evolution in populations and describing variation in quantitative traits. Population genetics principles will be used to study DNA sequence variation and quantitative traits.

STAT 6113* Probability Theory. Prerequisite(s): 5123 and MATH 5143. Measure theoretical presentation of probability, integration and expectation, product spaces and independence, conditioning, different kinds of convergence in probability theory, statistical spaces, characteristic functions and characteristic applications.

STAT 6203* Large Sample Inference. Prerequisite(s): 5223 and 6113. Different types of convergence in probability theory, central limit theorem, consistency, large sample estimation and tests of hypotheses, concepts of asymptotic efficiency, nonparametric tests.

STAT 6223* Advanced Statistical Inference. Prerequisite(s): 6113. Point
estimation, maximum likelihood, Cramer-Rao inequality, confidence intervals, Neyman-Pearson theory of testing hypothesis and power of test.

STAT 6910* Special Problems. 1-6 credits, max. 12. Prerequisite(s): Consent of instructor. Investigation of special problems in the theory and application of statistics using current techniques. Special studies for PhD level students.

Strategic Communication (SC)

SC 2183 Introduction to Strategic Communications. Prerequisite(s): Departmental majors only. This course provides students with information and insights about strategic communications: how messages are created and framed, why we respond to messages the way we do, and how to employ communications strategies to advance organizational goals. The course will address the media, methods, functions and ethics of institutions’ communication and interactions with a variety of audiences with an emphasis on public relations and advertising.

SC 3353 Persuasive Writing for Strategic Communicators. Lab 2. Prerequisite(s): MC 2003 and MC 2023 and SC 2183 with a grade of "C" or better in each; and pass proficiency review. An examination of the language of persuasive communication, how persuasion works and the techniques of persuasive message strategy. Application of persuasive writing for traditional media and emerging digital media.

SC 3383 Strategic Communications Management and Strategies. Prerequisite(s): MC 2003 and MC 2023 and SC 2183 with a grade of "C" or better in each; and pass proficiency review. The practice and techniques of public relations as a management function in business, industry, agriculture, government, education and other fields.

SC 3443 Social Media. Prerequisite(s): MC 2003 and MC 2023 and SC 2183 with a grade of "C" or better in each; and pass proficiency review. The practice and application of social media such as Facebook, MySpace, Twitter and other social networking sites to public relations practice.

SC 3461 Event Planning and Communication. Prerequisite(s): MC 2003 and MC 2023 and SC 2183 with a grade of "C" or better in each or permission of instructor. This course covers the fundamentals of event planning from a strategic communications perspective. Teaches a variety of aspects involved in event planning including creating a vision and strategic plan, understanding various marketing strategies, budget management, networking, conference design, and assessment. Attendance of two events outside of class are required.

SC 3600 Strategic Communications Internship. 1-3 credits, max. 6. Prerequisite(s): SC 3353 and SC 3753 with a grade of "C" or better in both and consent of instructor; and pass proficiency review. Internship practice for qualified strategic communications students who wish creative communications experience beyond that available in the classroom.

SC 3601 Copywriting and Creative Strategy. Lab 2. Prerequisite(s): SC 3353 and SC 3753 with "C" or better in both; and pass proficiency review. Emphasis on developing creative strategy in the context of an advertising campaign. Focus on the "Big Idea" with in-depth skills development in advertising copywriting across all media and formats.

SC 3753 Graphic Design for Strategic Communication. Lab 2. Prerequisite(s): MC 2003, MC 2023, and SC 2183 with a grade of "C" or better in each; and pass proficiency review. An analysis and application course focused on designing elements used in strategic communication to include both traditional media and new media. Creative and practical aspects of typography, layout and design. Lab component offers hands-on instruction and skills development.

SC 3953 Research Methods for Strategic Communicators. Prerequisite(s): MC 2003, MC 2023, and SC 2183 with a grade of "C" or better in each; and STAT 2013 or STAT 2053; and pass proficiency review. Provides an overview of strategic communication research, with an emphasis on its application to the development and evaluation of the strategic communication message. Audience and media research are studied, and primary and secondary information sources are employed. Procedures for conducting a research project are outlined, and students participate in the research planning process, the gathering of primary data, and the analysis and presentation of results.

SC 4013 Advertising Media and Markets. Prerequisite(s): SC 3353 and SC 2183 with a grade of "C" or better in each; and pass proficiency review. Introduction to the strategic use of media. Major principles of media planning and buying, audience measurement, media research, new media technology, and market segmentation.

SC 4223 Media Sales and Marketing. Prerequisite(s): MC 2003 and MC 2023 with a grade of "C" or better in both; and pass proficiency review. The primary focus of this course is to learn to sell advertising time and space and gain insight into the professional sales process. Course will explore the role of sales in the marketing mix, the intricacies of the different local media available to advertisers, how to make effective sales presentations and the art of prospecting.

SC 4383 Media Relations. Prerequisite(s): Senior standing, minimum graduation/retention GPA of 2.5. Strategies for dealing with the news media. Students will gain hands-on experience in conducting media news conferences, pitching story ideas and preparing themselves and others for dealing with news media interviews. Meets with MC 5383. No credit for students with credit in MC 5383.

SC 4493 Advanced Public Relations Writing. Lab 2. Prerequisite(s): SC 3353 and SC 3753 with a grade of "C" or better in both; and pass proficiency review. An advanced application course in creating, planning, researching, writing, editing and designing of multimedia materials used in public relations communications.

SC 4520 Specialized Strategic Communication Applications. 3 credits, max. 6. Prerequisites: SC 3353 and SC 3753 with a grade of "C" or better in both; and pass proficiency review. Professional strategic communications at an advanced level. Strategic communications study of non-profit, corporate, agency, international and other applications. Course content varies by semester. No credit for students with credit in MC 5520 during the same semester or with the same subtitle.

SC 4603 Integrated Marketing Communication. Prerequisite(s): MC 2003 and MC 2023; and SC 2183 or MKTG 3213 with a grade of "C" or better in each; and pass proficiency review. Planning and the value of coordinating the various promotional mix elements within a communication campaign to create maximum clarity and impact. Communication elements including advertising, public relations, direct marketing and sales promotion examined to determine strategies for combining and integrating them into an effective campaign. Theories, models and tools to make better promotional communication decisions. No credit for students with credit in MC 5603.

SC 4653 Electronic Media Advertising. Prerequisite(s): SC 2183 or MKTG 3213 with a grade of "C" or better; and pass proficiency review. Introduction to the strategic use of entertainment marketing and new media in advertising. Major principles of engagement through current trends in advertising and branding via new technologies, product placement, sponsorship, and cross promotions. All types of new media and entertainment marketing will be explored and analyzed including, but not limited to, Internet advertising, product placement in film, TV and gaming, mobile marketing, and viral marketing.

SC 4663 Electronic Media Advertising. Prerequisite(s): SC 3353 and SC 3753; or MJMM 4423 with a grade of "C" or better in each; or permission of instructor; and pass proficiency review. Designed to help students develop and present their design and creative work in an integrated package coupled with personalized identity materials. Emphasis will be on applying advanced visual and graphic communication theories to present an attractive and persuasive portfolio of creative work. It is intended for students who have completed a significant amount of course work in their field. An intermediate level of experience with desktop design software is assumed.

SC 4843 Strategic Communication Campaigns. Prerequisite(s): SC 3383, SC 3953, SC 4013; and SC 3603 OR SC 4493 ALL with "C" or better; or permission of instructor; and pass proficiency review. Planning, preparation and presentation of comprehensive integrated strategic communication campaigns for national or local clients. Student teams produce all aspects of the campaign, from conception to presentation. Satisfies capstone requirements for all majors.

SC 4980 Advertising Competitions. 3 credits, max. 6. Prerequisite(s): Consent of instructor. Research and construction of a comprehensive communications marketing campaign for the America Advertising Federation National Student Advertising Competition. Student team members must make application for admission.

Telecommunications Management (TCOM)

TCOM 5153* International Telecommunications Management. Prerequisite(s): 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.

Theatre (TH)

TH 1323 Acting I. 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.

TH 1500 Run Crew Practicum. 1 credit, max. 6. Practical application of run crew duties by participation in technical rehearsals and performances for a Theatre Department production.

TH 1663 Stage Technology. Lab 4. An introduction to technical theatre and set construction. Lectures provide background and theory; laboratory hours teach hands-on skills needed in the technical theatre environment including scenery, props, lighting, sound, design and scene painting.

TH 1673 Costume Technology. Lab 4. An introduction to costume technology. Lectures provide background and theory; laboratory hours...
teach hands-on skills needed in a theatrical costume shop including sewing, patterning and alterations.

TH 2213 Stage Speech and Diction. Lab 2. This course will focus on learning the “General American” or “Broadcast Standard” accent of English. Also the student will be able to read and write in the International Phonetic Alphabet. Basic articulatory procedures will be sharpened for better communication skill, no matter what career in which speech is used.

TH 2323 Acting II. Prerequisite(s): TH 1323. Continuation and refinement of 1323. Textual and character analysis, characterization and inner techniques based on Stanislavskian and Meisner systems. Audition techniques and scene work focusing on truthful behavior through work on modern and contemporary plays.

TH 2413 (H) Introduction to the Theatre. Explores the role and purpose of theatrical performances in western culture and how the event creates and conveys meaning. Attendance of plays and study of acting, directing, stage technology, dramaturgy, and aesthetic movements. For non-majors: no prior theatre experience necessary.

TH 2500 Production Crew Practicum. 1-2 credits, max 6. Prerequisite(s): TH 1663 or TH 1673. Laboratory experience in the theatrical production process through participation on a production crew for a departmental production or semester.

TH 2553 Introduction to Stage Design. Prerequisite(s): 1663 or 1673 or consent of instructor. An integrated overview of the theory and practice of design for the stage.

TH 2563 Play Analysis. Play analysis and writing for the theatre from the point of view of different theatre practitioners and scholars. Course focuses on the techniques necessary for the transfer of dramatic literature to theatrical production.

TH 2633 Movement for the Actor. This is an introductory course to the physical aspects of role creation. It introduces the student to several methodologies used in analyzing and altering physical performance in theatre and film. The students will be evaluated on the application of theories discussed and demonstrated in class.

TH 2833 Transitions to Professions in Design and Technology. Prerequisite(s): 1663 and 1673; and 1500 or 2500. Preparation for transition into the professional world for theatre designers and technicians. Includes career development, national/international theatre organizations, portfolio preparation, websites, resume/application writing and interviewing.

TH 2971 Stage Makeup. Lab 2. Techniques of basic stage makeup. Application of makeup including a study of facial anatomy and character development. Laboratory work in preparation for departmental productions.

TH 3183 Scene Design for Theatre. Prerequisite(s): 2553 or 2563 or consent of instructor. The scenic designer’s approach to the script; execution of sketches, models, and working drawings.

TH 3213 Dramaturgy. Investigation of the nature and process of dramaturgy. Emphasis on analytical, research, and writing skills useful to all theatre artists. No credit for students with credit in 5313.

TH 3323 Sound Design and Technology. Prerequisite(s): 2553 or 2563 or consent of instructor. Use and design of sound in theatrical productions, including voice recording, scoring, script analysis, and effects.

TH 3373 Acting III. Prerequisite(s): TH 1323 and TH 2323 or consent of instructor. Exploration of vocal and physical techniques necessary for the performance of classical verse plays through the works of William Shakespeare. Students begin to acquire the tools to deliver verse and poetry text.

TH 3400 Upper-Division Projects. 1-3 credits, max 6. Prerequisite(s): Consent of instructor. Individual or group study of techniques, history, or literature of the theatre. Required written survey of the project and self-evaluation of its results, or a term paper. Cannot receive credit for both 3400 and 5400.

TH 3433 Acting for the Camera. Prerequisite(s): TH 1323 and TH 2323 or consent of instructor. The course is designed to introduce the student to acting techniques for electronic media. Emphasis will be on practical application theory. Through a series of scenes and exercises the student will become familiar with the differences and similarities between stage and screen acting. Basic film editing, camera work, lighting and sound will be explored.

TH 3500 Theatre Practicum II. 1-2 credits, max 4. Prerequisite(s): Consent of instructor. Advanced laboratory experience in theatre production, design, acting, and/or crew assignments.

TH 3530 Topics in Performance. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Specialized topics in acting or directing.

TH 3593 Lighting for Theatre. Lab 2. Prerequisite(s): 2553 and 2563 or consent of instructor. Stage lighting design, elementary electricity, mechanics of lighting instruments. Practical experience in lighting in preparing and running departmental productions.

TH 3633 (D,H) Voices of Diversity. Survey of dramatic literature and theatre created by diverse dramatists and theatre companies in the United States. Course focus may either be a broad investigation of drama across many different identity groups or an in-depth exploration of the theatrical activity of one group of people.

TH 3853 Auditions and the Professional Actor/Director. Prerequisite(s): TH 1323 and TH 2323. A professional acting studio focusing on the “business” of show business for actors and directors. Networking and career building strategies will be explored and the building of an actor’s repertoire of audition material will be developed. The class will produce students to writing resumes, selecting headshots, understanding unions, agents, managers, etc.

TH 3923 (H) Theatre History I. Aesthetic and social relationships of theatre and civilization from Ancient Greece to the 18th century.

TH 3933 (H) Theatre History II. Aesthetic and social relationships of theatre and civilization from the 19th century to the present.

TH 3943 (H) Contemporary Theatre. Aesthetic and social relationships of theatre and civilization from the late Twentieth Century through the present.

TH 3953 Costume Design. Lab 2. Prerequisite(s): 2553, 2563 or consent of instructor. Approaches to basic costume design including research, conceptual analysis, figure drawing, and evaluations of sketches and renderings.

TH 4383* Stage Combat. Prerequisite(s): TH 2633 or consent of instructor. This course introduces the student to stage violence. Emphasis is placed on safe and dramatically effective performance of violent scenes, to include slapstick and physical comedy. Stage fencing, unarmed combat, basic tumbling, and physical comedy is covered within the context of scene work.

TH 4403 Senior Honors Project. Prerequisite(s): Departmental invitation, senior standing, Honors Program participation. A guided reading and research program ending with a senior thesis or directed study toward the direction of a faculty member, with second faculty committee member. Required for graduation with departmental honors in theatre.

TH 4563 Senior Project. Prerequisite(s): Senior standing and consent of instructor. A guided reading and research program ending with a thesis or performance under the direction of a faculty member.

TH 4630 Topics in Design and Technology. 1-3 credits, max 9. Prerequisite(s): TH 1663, 1673 and 2553 or consent of instructor. Specialized topics in scenic, costume, sound, or lighting design or technology.

TH 4653 Advanced Stage Technology. Lab 2. Prerequisite(s): 1663. Advanced study in theatrical production techniques, including metalworking, special fabrics, rigging, and advanced carpentry.

TH 4673* Advanced Costume Construction. Prerequisite(s): 1673. Advanced construction techniques for theatrical costumes. Includes period garments, pattern drafting, fabric manipulation, and boning.

TH 4753* Stage Management. Prerequisite(s): Consent of instructor. Procedures and skills of effective stage management. Authoritative coordination of performers and technicians during rehearsal and performance periods. Maintenance and use of the production prompt book, notation of ground plan and blocking; scene shifts; cues for lighting, sound, special effects, and performers; opening and calling the show; post-show wrap-up.

TH 4953* Directing. Prerequisite(s): TH1323 and TH 2563 and TH 4753 or consent of instructor. Play analysis for production, problems in staging, and the role of the director. Planning and direction of scenes in laboratory situations.

TH 4983* Scene Painting. Lab 3. 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.

TH 5000* Master’s Thesis and Research. 1-6 credits, max 6. Prerequisite(s): Consent of department head. Master’s level research in theatre for thesis option graduate students.

TH 5063* Scenography. Investigation of design styles and theories and the designers whose work advances the artform. Special emphasis will be placed on collaboration strategies for developing visual and directorial production concepts.

TH 5100* Master’s Creative Component and Research. 1-3 credits, max 3. Master’s level research in theatre for creative component option graduate students.

TH 5113* Theatre History and Theory I. Global study of theatre and performance across cultures and multiple theories used to interpret and construct world theatre history, from ancient times to the nineteenth century.

TH 5223* Seminar in Theatre History. Prerequisite(s): Undergraduate degree or instructor consent. Specific topics in theatre history with focus on theatre production in one historical or artistic era (e.g. Russian Silver Age, Post War French Absurdism, Imperial Roman), or the comparative study of theatre and drama in various nations.

TH 5243* Seminar in Dramaturgy. Prerequisite(s): Undergraduate degree or instructor consent. Specific topics in the study of dramatic writing and directing. No credit for students with credit in 3213.

TH 5400* Seminar in Theatre. 1-3 credits, max 9. Prerequisite(s): Consent of instructor. Individual or group studies of techniques, history or literature of the theatre. A term paper or written report and self-evaluation of the study or

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Prerequisite(s): Consent of instructor. Course in preparing students for college level courses in the Arts with an emphasis on understanding different art forms such as classical, contemporary, and experimental. TH 5507 Seminar in Dramatic Literature. Prerequisite(s): Consent of instructor. Selected topics in dramatic literature. Texts and themes will vary by semester. TH 5503* Problems in Advanced Directing. Prerequisite(s): 4953, consent of instructor. Problems in directing styles, especially Shakespeare, comedy, and absurdist drama. Preparation, rehearsal and staging of a complete production by each student.

University (UNIV)

UNIV 0023 Concepts of Algebra. Previous study in algebra is not assumed. Linear equations, laws of exponents, factoring applications, story problems, and substituting data into formulas. A comprehensive review of arithmetic and algebraic procedures incorporated throughout the course. This course is not acceptable for degree credit at Oklahoma State University. This course alone will not satisfy remediation requirements. Graded on a satisfactory-unsatisfactory basis. Course offered and transcribed by Northern Oklahoma College.

UNIV 0113 Basic Composition. Intensive instruction in sentence and paragraph structure, punctuation, grammar and word usage. May be used to fulfill the English remediation requirement as established by State Regents policy. This course is not acceptable for degree credit at Oklahoma State University. Graded on a satisfactory-unsatisfactory basis. Course offered and transcribed by Northern Oklahoma College.

UNIV 0123 Intermediate Algebra. Prerequisite(s): One year of high school algebra or equivalent. In-depth coverage of applications of factoring, arithmetic operations with polynomial and rational algebraic expressions, review of laws of exponents (integers, fractions), simplifying radical expressions, linear equations in two variables. May be used to fulfill the mathematics remediation requirement as established by State Regents policy. This course is not acceptable for degree credit at Oklahoma State University. Graded on a satisfactory-unsatisfactory basis. Course offered and transcribed by Northern Oklahoma College.

UNIV 0133 Basic Composition. Intensive instruction in sentence and paragraph structure, punctuation, grammar and word usage. May be used to fulfill the English remediation requirement as established by State Regents policy. This course is not acceptable for degree credit at Oklahoma State University. Graded on a satisfactory-unsatisfactory basis. Course offered and transcribed by Northern Oklahoma College.

UNIV 0143 Improving College Reading Skills. Instruction to improve reading comprehension, vocabulary building, study and reference skills, and critical thinking. May be used to fulfill the reading remediation requirement as established by State Regents policy. This course is not acceptable for degree credit at Oklahoma State University. Graded on a satisfactory-unsatisfactory basis. Course offered and transcribed by Northern Oklahoma College.

UNIV 0153 Critical Content Reading & Scientific Reasoning. Course in reading consisting primarily of reviewing and learning basic reading skills, then practicing and applying those skills to content area reading. May be used to fulfill the science and reading remediation requirements as established by Oklahoma State Regents policy. This course is not acceptable for degree credit at Oklahoma State University. Graded on a satisfactory-unsatisfactory basis. Course offered and transcribed by Northern Oklahoma College.

UNIV 1111 University College First Year Seminar. Prerequisite(s): Designed for incoming freshman in University College Advising. Aids students in becoming aware of campus resources; exploring various majors and careers; becoming familiar with University online resources; understanding University academic rules and regulations; and enhancing study skills and attitudes which can contribute to academic success

UNIV 2001 Academic Assessment and Evaluation. Required for students in University Academic Assessment Program and available campus wide to students on academic probation. Identifies reasons for experiencing academic difficulty; assessment of reading ability and individual learning styles; understanding university policies and procedures and current issues in American education; development of goals, attitudes, and study skills needed to achieve academic success; and exploration of careers, majors, and alternative educational experiences.

UNIV 2500* Introductory Studies. 1-3 credits, max 6, Lab 0-6. May be used for not more than two semesters for new or experimental topics or techniques.

UNIV 2511 Introduction to Health Careers. An introduction to medical professions related to all areas of human and animal health. Graded on pass-fail basis.

UNIV 2611 Health Portfolio Development. For students who have selected a specific health career. Explore how to be a competitive applicant to a health professional school, including factors such as prerequisite courses, GPA, admission test, volunteering, job shadowing, personal statements, interviews, and letters of recommendation.

UNIV 2910 Niblack Research Scholars. 1 credit, max 4, Lab 2. Prerequisite(s): Current recipient of the Niblack Research Scholar Award. Scientific research in a laboratory environment at an early stage of an academic career.

UNIV 3001 Academic Assessment for Transfer Students. Required for students in transfer probation program and available campus wide to upper division students on probation. Assignment of individual learning ability and learning styles; understanding university policies and procedures related to transfer students and current issues in American education; development of goals, attitudes, and study skills needed to achieve academic success; and exploration of careers, majors, and alternative education experiences. No credit for student with credit in UNIV 2001.

UNIV 3110 Directed Study. 1-18 credits, max 18. Prerequisite(s): Written approval applied by instructor, the department head, and the dean of the student’s college. Independent study, research, field work or internship. Some sections will be graded on a pass-fail basis.

UNIV 3511 Health Profession School Preparation. Prerequisite(s): Junior/ senior pre-health students. This seminar targets the junior/senior pre-health professional primarily pre-medical, pre-dental, and pre-optometry. The seminar will provide the student with the necessary tools needed for the following to apply to their professional program: the application process; interview process, including a mock interview; composition of an interview statement; MCAT, DAT & OAT preparation; shadowing/volunteer experience. Graded on a pass-fail basis.

Veterinary Biomedical Sciences (VBSC)

VBSC 5000* Master's Research and Thesis. 1-6 credits, max 6. Prerequisite(s): Graduate standing. Research problem for meeting requirements of the Masters degree.

VBSC 5010* Professional Skills for Biomedical Sciences. 1-3 credits, max 3. Prerequisite(s): Graduate student standing; consent of instructor. Acquiring skills that are usually not taught in other courses but are essential to be successful in the graduate program as well as in a career in science. Writing and publishing a scientific paper, writing a successful grant proposal, preparing effective oral and written presentations, and understanding professional ethics in the conduct of scientific research.

VBSC 5013* Veterinary Biomedical Sciences I. Prerequisite(s): Graduate standing and consent of instructor. The course is designed to provide a comprehensive understanding of cellular and molecular biology including protein and DNA structure and function, gene regulation, membrane function and traffic, mitochondria, cytoskeleton, cell communication, cell cycle, cell death, and cell junctions, adhesion and extracellular matrix as well as other relevant topics.

VBSC 5023* Veterinary Biomedical Sciences II. Prerequisite(s): 5013 or permission of the department. Integrated applied applied biological and pathological knowledge of hosts and pathogens of veterinary interest including infectious disease processes; hemodynamic, inflammatory, immune and tissue repair responses; genetic, environmental, nutritional, and neoplastic disorders; and aging.

VBSC 5103* Biochemical Toxicology. Prerequisite(s): Consent of instructor. In-depth overview of biochemical and molecular mechanisms of interactions between exogenous chemicals and living systems. Transport, distribution, elimination and alteration of exogenous chemicals within the body and mechanisms whereby exogenous chemicals disrupt biochemical processes critical for cell/organ/organism integrity and function. (No credit for students with degree credit in VBSC 5102*) (Same course as ITOX 5103*)

VBSC 5110* Special Problems. 1-18 credits, max 18. Prerequisite(s): Consent of instructor. Organization and structure of cells and tissues of domestic animals. Graded on pass-fail basis.

VBSC 5120* Current Topics in Veterinary and Biomedical Science. 1 credit, max 4. Prerequisite(s): 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.

VBSC 5123* Veterinary Histology. Lab 3. Prerequisite(s): Graduate standing and consent of instructor. Molecular, cellular and organ system pathology. Establishing a base of knowledge and understanding requisite to subsequent courses. Same course as VMED 7123.

VBSC 5134* Veterinary Physiology I. Lab 4. Prerequisite(s): Graduate standing and consent of instructor. Molecular, cellular and organ system physiology. Establishing a base of knowledge and understanding requisite to subsequent courses. Same course as VMED 7114.

VBSC 5143* Veterinary Physiology II. Prerequisite(s): Graduate standing and consent of instructor. Molecular, cellular and organ system physiology. Establishing a base of knowledge and understanding requisite to subsequent courses.
courses. Same course as VMED 7113.

**VBSC 5155** Veterinary Physiology III. Prerequisite(s): Graduate standing and consent of instructor. Molecular, cellular, and organ system physiology. Establishing a base of knowledge and understanding requisite to subsequent courses. Same course as VMED 7235.

**VBSC 5202** Evaluation of Biomedical Research Data. Prerequisite(s): STAT 5013 or consent of instructor. Statistical analysis of biomedical data with emphasis on selection of appropriate biometrical procedures and interpretation of results rather than on computational aspects of procedures. Exploration of experimental design, data collection, and analysis within the context of biomedical investigation methodologies.

**VBSC 5221** Epidemiology and Evidence-Based Medicine. Prerequisite(s): graduate standing and consent of instructor. Principles and uses of evidence-based practice of veterinary medicine; comprehension and utilization of scientific research; interpretation of basic concepts of observational study of disease. Same course as VMED 7221* and MPH 5221*.

**VBSC 5223** Veterinary Parasitology I. Lab 2. Prerequisite(s): Graduate standing and consent of instructor. Introduction to the general principles of parasitism and parasites of veterinary medical importance including taxonomy, morphology, pathology, and control of host-parasite relationships, infectious processes and pathogenesis, diagnostic methods, treatment and control measures and public health importance. Same course as VMED 7223.

**VBSC 5251** Veterinary Immunology. Lab 4. Prerequisite(s): Graduate standing and consent of instructor. Basic principles of immunology and their application to veterinary medicine. Same course as VMED 7253.

**VBSC 5264** General Pathology. Lab 2. Prerequisite(s): Graduate standing and consent of instructor. Cellular and tissue pathology, pigments, inflammation, immunopathology, disturbances of growth and circulation, and neoplasia. Functional disturbances that accompany changes in structures as well as the causes and pathogenesis of diseases. Same course as VMED 7264.

**VBSC 5323** Veterinary Parasitology II. Lab 2. Prerequisite(s): Graduate standing and consent of instructor. Principles of diagnostic, treatment, control and prevention of animal diseases produced by arthropod, protozoan, rickettsial, and helminth parasites. A problem-based approach to parasitic diseases affecting the integumentary, respiratory, hemi-lymphatic, reproductive, urinary, nervous/sensory, musculoskeletal, and alimentary systems with emphasis on diseases of domestic animals. Same course as VMED 7323.

**VBSC 5333** Pharmacology I. Prerequisite(s): Graduate standing and consent of instructor. Introduction of the principles of pharmacodynamics, drug disposition and pharmacokinetics. Pharmacological effects, mechanisms of action, metabolism, disposition, clinical indications and toxic effects of drugs acting on the autonomic central nervous, cardiovascular, respiratory, and renal systems. Same course as VMED 7333.

**VBSC 5344** Infectious Diseases I. Lab 4. Prerequisite(s): Graduate standing and consent of instructor. Important animal diseases caused by bacteria, fungi and viruses will be covered on a system basis. Mechanisms of infectious disease processes and the relationship of such processes to disease development, diagnosis, treatment and control. The relationship of zoonotic diseases to community and environmental health as well as important zoonoses. Same course as VMED 7344.

**VBSC 5363** Clinical Pathology. Lab 2. Prerequisite(s): Graduate standing and consent of instructor. Basic concepts pertinent to data interpretation and laboratory methods used in evaluation of disease. Same course as VMED 7363.

**VBSC 5404** Techniques in Parasitology. Lab 1. Prerequisite(s): 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.

**VBSC 5413** Food Safety and Public Health. Prerequisite(s): graduate standing and consent of instructor. Introduction to public health and diseases transmissible to humans. Potential human health hazards of foods in animal origin and principles of safe food production, processing, handling and inspection, including pathogen reduction and HACCP regulations. Same course as VMED 7413* and MPH 5413*.

**VBSC 5432** Pharmacology II. Prerequisite(s): Graduate standing and consent of instructor. Continuation of 5333 that includes the mechanisms of action, disposition, adverse effects, and indications for groups of pharmacological agents used in veterinary medicine. Same course as VMED 7432.

**VBSC 5444** Infectious Diseases II. Lab 4. Prerequisite(s): Graduate standing and consent of instructor. Continuation of Infectious Diseases I (5344). Same course as VMED 7454.

**VBSC 5442** Hemolymphatic and Oncology. Prerequisite(s): Graduate standing and consent of instructor. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the blood and lymphatic system. (6 week module) Same course as VMED 7482.

**VBSC 5512** Laboratory Animal Medicine. Lab 1. Prerequisite(s): Graduate standing and consent of instructor. Introductory course focusing on the biology and major diseases commonly used laboratory animals. (One - 3 hour lab per semester) Same course as VMED 7512.

**VBSC 5522** Molecular Genetics. Prerequisite(s): Graduate standing and consent of instructor. The expression, purification, characterization, and application of biological macromolecules in therapeutics and diagnostic relevant to animal and human health. Same course as VMED 7532.

**VBSC 5533** Toxicology. Prerequisite(s): Graduate standing and consent of instructor. Diagnosis and management of intoxications involving plant, chemical, and biological toxins. (Nine week course) (Two - 2 hour labs per 9 weeks) Same course as VMED 7533.

**VBSC 5542** Clinical Endocrinology I. Prerequisite(s): Graduate standing and consent of instructor. The advanced medical endocrinology addressing diagnostic endocrinology and therapeutic endocrinology. Diagnostic endocrinology shall examine the physiological and medical basis for selecting provocative or non-provocative testing procedures as an adjunct to completing a definitive diagnosis. Therapeutic endocrinology involves the use of diagnostic endocrinology to evaluate the efficacy of medical treatment of endocrinopathies and the medical use of hormonal preparations to control animal physiology or endocrinology and non-endocrine diseases. Same course as VMED 7542.

**VBSC 5563** Musculoskeletal System. Prerequisite(s): Graduate standing and consent of instructor. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the musculoskeletal system. (Ten week course) (Two - 2 hour labs per 10 weeks) Same course as VMED 7563.

**VBSC 5564** Aminergic System. Prerequisite(s): Graduate standing and consent of instructor. Pathogenesis, diagnosis, pathology, medical and surgical treatment and prevention of diseases related primarily to the aminergic system. (Fourteen week course) Same course as VMED 7564.

**VBSC 5583** Dermatology and Endocrinology. Prerequisite(s): Graduate standing and consent of instructor. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to skin and the endocrine system (nine-week model). (One - 4 hour lab per 9 weeks) Same course as VMED 7583.

**VBSC 5612** Clinical Neurology. Prerequisite(s): Graduate standing and consent of instructor. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the cardiovascular and respiratory systems. (Nine week course) (Four - 2 hour labs per 9 weeks) Same course as VMED 7612.

**VBSC 5632** Exercise Physiology. Prerequisite(s): Graduate standing and consent of instructor. Current knowledge base pertaining to the acute and chronic adaptations to exercise in domestic animals and current techniques for the evaluation and correction of poor performance. Same course as VMED 7632.

**VBSC 5651** Infectious and Parasitic Diseases of Wild Animals. Prerequisite(s): Graduate standing and consent of instructor. Systematic approach to infectious and parasitic diseases that affect wild animals. Emphasis will be placed on disease recognition in wild species, ecology of transmission, and population management implications of disease diagnosis. Same course as VMED 7651.

**VBSC 5662** Urinary System. Prerequisite(s): Graduate standing and consent of instructor. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the urinary system. (Three week module) Same course as VMED 7682.

**VBSC 5671** Clinical Endocrinology II. Prerequisite(s): Graduate standing and consent of instructor. Advanced medical endocrinology, focusing on endocrine diseases associated with 1) dysfunction of the endocrine pancreas, 2) selected endocrinopathies of the reproductive system, and 3) therapeutic use of hormones to control reproductive activity of animals. Same course as VMED 7671.

**VBSC 5691** A Focus on Zoonotic Diseases. Prerequisite(s): Graduate standing and consent of instructor. Overview of zoonotic aspects of infectious diseases, including the transmission to man, incidence and prevalence, prevention and control strategies, assessment of risk, and governmental and regulatory aspects of these public health threats. Diseases of all veterinary species will be balances according to various aspects of importance, ease of transmission, incidence, and other current concepts. Same course as VMED 7691.
VSC 5723* Parasitic Protozoa. Lab 3. Prerequisite(s): Graduate standing in zoology or entomology or consent of instructor. Structure, life cycle, physiology, host-parasite relationships, and diagnosis concerned with protozoan parasites.

VSC 5801* Nonclinical Drug Development. Prerequisite(s): Graduate standing. An instructor. This course will cover the basics to highly-regulated concepts in nonclinical drug development including pharmacology, pharmacokinetics, and toxicology, along with topics in chemistry manufacturing and controls.

VSC 5802* Experimental Principles and Approaches. Prerequisite(s): Graduate standing and consent of instructor. A review of experimental principles and approaches essential for design, conduct and analysis of research.

VSC 6000* PhD Research and Dissertation. 1-15 credits, max 45. Prerequisite(s): Graduate standing. Research problem for meeting requirements of the PhD degree.

VSC 6110* Seminar. 1-6 credits, max 6. Prerequisite(s): Graduate standing. Literature and research problems pertaining to veterinary biomedical sciences.

VSC 6120* Advanced Physiology of Selected Systems. 3-15 credits, max 15. Prerequisite(s): Graduate standing or consent of instructor. 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.

VSC 6200* Topics in Advanced Pharmacology and Toxicology. 1-4 credits, max 4. Prerequisite(s): Consent of instructor. Selected topics in advanced pharmacology, including xenobiotic kinetics and dynamics.

VSC 6203* Advanced Concepts in Veterinary Immunology. Prerequisite(s): 5113 or BIOC 3653 or MIRC 3254. Induction of immune responses, host defense mechanisms, immunoregulation, antigen presentation and immune recognition by B and T lymphocytes, using contemporary research publications.

VSC 6213* Toxicology: From Molecules to Ecosystems. Prerequisite(s): Graduate standing and consent of instructor. An integrated systems-based approach to toxicology from molecular, cellular, organ, organismal, and ecological perspectives. Same course as ITOX 6213.

VSC 6220* Advanced Topics in Cell Biology. 1-5 credits, max 12. Prerequisite(s): Consent of instructor. Selected topics in cell biology including membrane traffic, cell signaling, ion transport, cytoskeleton, cell cycle, cell junctions, and adhesion.

VSC 6223* Xenobiotic Disposition. Prerequisite(s): Graduate standing and consent of instructor. Quantitative analysis of xenobiotic absorption, metabolism, and excretion. Analysis of xenobiotic concentration-time data using pharmacokinetic software. Previously offered as VSC 6201. Same course as ITOX 6223.

VSC 6233* Laboratory in Electron Microscopy. Lab 12. Prerequisite(s): Consent of instructor. Students learn to prepare specimens for, and to operate, the electron microscope, and techniques for printing and preparation of electron micrographs for publication.

VSC 6550* Problems in Functional Morphology. 1-3 credits, max 3. Lab 3-9. Prerequisite(s): Consent of instructor. Investigations in comparative, gross, developmental or histologic morphology for graduate students.

VSC 6560* Advanced Pathology Techniques and Special Problems. 1-6 credits, max 6. Prerequisite(s): Graduate standing in biological sciences and consent of instructor. Investigations of contemporary techniques and methods used in diagnosis, technical work and research in pathology.

VSC 6650* Current Topics in Bacterial Pathogenesis. 1-10 credits, max 10. Prerequisite(s): VSC 5552 or equivalent and consent of instructor. Selected mechanisms in bacterial pathogenesis and host response using recent literature, such as genetic organization of virulence; regulation of virulence factors; attachment, adhesion, and invasion; capsules and outer membrane proteins; intracellular parasitism; endotoxin; exotoxins; iron acquisition and host sequestration; antibiotic resistance mechanisms; innate immunity; acquired immunity; and evasion of host immunity on a rotating basis. Lecture and discussion of directed reading of current literature.

VSC 6710* Seminar in Veterinary Clinical Sciences. 1-3 credits, max 3. Prerequisite(s): Graduate standing in the College of Veterinary Medicine, or internship or residency training program in the Department of Veterinary Clinical Sciences. Literature and research of problems pertaining to veterinary clinical sciences.

VSC 6712* Advances in Veterinary Medicine I. Prerequisite(s): Graduate standing in the College of Veterinary Medicine, or internship or residency training program in the Department of Veterinary Clinical Sciences. Special problems course emphasizing organ system physiology, selected diagnostic and therapeutic topics, and requiring a publication-quality paper on an approved subject.

VSC 6722* Advances in Veterinary Medicine II. Prerequisite(s): Graduate standing in the College of Veterinary Medicine, or internship or residency training program in the Department of Veterinary Clinical Sciences. Special problems course emphasizing organ system physiology, selected diagnostic and therapeutic topics, and requiring a publication-quality paper on an approved subject.

VSC 6910* Veterinary Pathology Slide Conference. 1-2 credits, max 6. Prerequisite(s): Medical degree. Guided weekly exercises based on veterinary diagnostic microscopy.

VSC 6920* Diagnostic Pathology. 1-4 credits, max 4, Lab 3-9. Prerequisite(s): 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.

VSC 6930* Comparative Anesthesiology. 1-3 credits, max 3. Prerequisite(s): Graduate standing in the College of Veterinary Medicine or consent of the head of the department. Anesthesiology of animals.

VSC 6950* Advanced Systemic Pathology. 2-4 credits, MS max 6, PhD max 12. Prerequisite(s): VMED 5264, graduate standing, consent of instructor. Total credit not to exceed six for the MS degree and 12 for the PhD. Re-enrollment permits the study of two to four different groups of organs and systems of the animal body. A consideration of the pathogenesis and the morphological, biochemical, and comparative aspects of lesions found in organs and tissues of the domesticated animals.

VSC 6960* Current Topics in Veterinary Clinical Pathology. 1-3 credits, max 9. Prerequisite(s): DVM or equivalent, graduate standing and consent of instructor. Obtaining current knowledge and developing critical thinking and reasoning skills through seminars and discussions of current literature from the field of veterinary clinical pathology and general pathology.

VSC 6963* Advanced Clinical Pathology. Prerequisite(s): VMED 5362 or equivalent, graduate standing and consent of instructor. Applied clinical biochemistry, organ function tests and related cytopathologic examination.

VSC 6973* Advanced Hematology. Prerequisite(s): VMED 5362 or equivalent, graduate standing and consent of instructor. The etiology and pathogenesis of the diseases of the blood and bone marrow.

Veterinary Clinical Sciences (VCS)

VCS 7003 Elective I. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Students required to choose four electives. Two of those electives on-campus. Two electives may be off-campus.

VCS 7013 Elective II. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Students required to choose four electives. Two of those electives on-campus. Two electives may be off-campus.

VCS 7023 Elective III. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Students required to choose four electives. Two of those electives on-campus. Two electives may be off-campus.

VCS 7033 Elective IV. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Students required to choose four electives. Two of those electives on-campus. Two electives may be off-campus.

VCS 7701 Intensive Care Clinic. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Clinical rotation in small animal intensive care/critical and emergency medicine. Letter graded.

VCS 7713 Radiology Clinic. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Diagnostic radiography, ultrasound, and other special imaging modalities.

VCS 7723 Equine Medicine Clinic. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of equine medical diseases.

VCS 7733 Community Practice. Lab 9. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Receiving and managing emergency and general medical and surgical cases in companion animals.

VCS 7743 Small Animal Internal Medicine. Lab 9. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of companion animal surgical diseases.

VCS 7753 Small Animal Surgery Clinic. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of diseases of food animal surgical diseases.

VCS 7763 Food Animal Medicine Clinic. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of diseases of food animal medical and surgical diseases.

VCS 7773 Large Animal Theriogenology. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Management of breeding cattle and horses at the Center for Veterinary Health Sciences Ranch, including artificial insemination, treatment of infertility, periparturient management, and pediatrics.

VCS 7783 Zoological Medicine Clinical Elective. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Health
maintenance, diagnosis and treatment of medical or surgical conditions in zoo, exotic pet and wildlife species.

VCS 7793 Equine Surgery Clinic. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment, and prevention of equine surgical diseases.

VCS 7803 Clinic Pool. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Semi-elective clinical assignment. Graded on a pass/fail basis.

VCS 7813 Preceptorship Clinic. Lab 2. Prerequisite(s): 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.

VCS 7823 Non-OSU Clinic. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Approved clinical rotations off the OSU campus. Graded on a pass/fail basis.

VCS 7833 Special Clinics. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine or graduate veterinarian. Special assignments for introductory clinical studies in the following: selected species clinics, health promotion, clinical pathology and parasitology, diagnostic laboratory; and special aspects of the basic sciences. Graded on a pass/fail basis.

VCS 7843 Anesthesiology. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Management of clinical anesthesia in various domestic species.

VCS 7853 Equine Performance Medicine. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Management of clinical anesthesia in various domestic species.

VCS 7863 Clinical Pathology and Parasitology Elective. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Students will work with clinical pathology residents and laboratory personnel. Emphasis is placed on cytology, hematology, and parasitology. Each student will spend one week in each area. Graded on a pass/fail basis.

VCS 7873 Ultrasound. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine and VMED 7443. Participants will attend radiology rounds daily as well as observing and/or performing diagnostic ultrasound exams on common domestic animal species, and, when not actively participating in a clinical ultrasound study, in library research on the subject of diagnostic ultrasound, including, but not limited to, viewing a CD, reading textbooks and journal articles on the subject and examining prepared ultrasound case studies containing diagnostic challenges and problems to solve.

VCS 7883 Animal Shelter. Lab 3. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine and VMED 7443 or VMED 7412 and one surgery rotation. The goals of this rotation are to apply basic clinical, surgery and anesthesia skills primarily to pet adoption candidates. Graded on a pass/fail basis.

VCS 7893 Field Services (Ambulatory) Elective. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine and VMED 7443. Participants will attend simulations will be utilized to encourage the development of problem lists, differential lists, and a plan of action for a wide variety of diseases in domestic and wildlife species.

VCS 7923 Oncology Elective. Lab 2. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. All three week rotations will provide a clinical, comprehensive, and in-depth learning experience from patients with cancer. Instruction and guidance will be provided by “Instructor of Record” for the course.

Veterinary Medicine (VMED)

VMED 7113 Veterinary Physiology II. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Study of molecular, cellular and organ systems physiology with emphasis on establishing a base of knowledge and understanding requisite courses within the curriculum of veterinary medicine. Continuation of VMED 7114. Previously offered as VMED 7120.

VMED 7114 Veterinary Physiology I. Prerequisite(s): First-year standing in the College of Veterinary Medicine. To introduce students to the relevant concepts of cell physiology and cardiovascular physiology, providing a foundation for Physiology II and III, clinical coursework and clinical rotations.

VMED 7123 Veterinary Histology. Lab 1. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Organization and structure of cells and tissues of domestic animals.

VMED 7144 Gross and Developmental Anatomy. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Embryology and anatomy of domestic mammals using the dog as the primary model. Integrated lecture-dissection-laboratory format. 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.

VMED 7152 Zootecology. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Animal breeds and identification, animal production and marketing systems and animal handling and restraint as it applies to production and marketing.

VMED 7162 Jurisprudence and Ethics. Prerequisite(s): First-year standing in College of Veterinary Medicine. Introduction to veterinary jurisprudence, ethical considerations, governance, human-animal bond, and evolving issues in animal law and animal welfare.

VMED 7221 Epidemiology and Evidence-Based Medicine. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Principles and uses of evidence-based practice of veterinary medicine; comprehension and utilization of scientific research; interpretation of basic concepts of observational study of disease.

VMED 7223 Veterinary Parasitology I. Lab 2. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Introduction to the general principles of parasitism and parasites of veterinary medical importance including taxonomy, morphology, biology of parasites, modes of transmission, host-parasite relationships, infectious processes and pathogenicity, diagnostic methods, treatment and control measures and public health importance.

VMED 7235 Veterinary Physiology III. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Molecular, cellular and organ system physiology. Establishing a base of knowledge and understanding requisite to subsequent courses.

VMED 7243 Comparative Anatomy. Prerequisite(s): First-year standing in the College of Veterinary Medicine. Comparative and functional gross anatomy of domestic mammals. Emphasis on the integration of developmental gross, radiologic, and applied clinical aspects of veterinary anatomy as they relate to a topographical appreciation of the living individual. Integrated lecture-dissection laboratory format.

VMED 7253 Veterinary Immunology. Prerequisite(s): First-year standing in College of Veterinary Medicine. Basic principles of immunology and their application to veterinary medicine.
VMED 7264 General Pathology. Lab 2. Prerequisite(s): First-year standing in the College of Veterinary Medicine or consent of instructor. Cellular and tissue pathology, pigments, inflammation, immunopathology, disturbances of growth and circulation, and neoplasia. Functional disturbances that accompany changes in structures as well as the causes and pathogenesis of disease.

VMED 7311 Introduction to Clinics I. Lab 2. Prerequisite(s): Second-year standing in College of Veterinary Medicine. Clinical orientation including rotations in instruction and service units in the College. Graded on a pass-fail basis.

VMED 7323 Veterinary Parasitology II. Prerequisite(s): Second-year standing in the College of Veterinary Medicine. Principles of diagnosis, treatment, control and prevention of animal diseases produced by arthropod, protozoan, rickettsial, and helminth parasites. A problem-based approach to parasitic diseases affecting the integumentary, respiratory, hemic-lymphatic, reproductive, nervous/sensory, musculoskeletal, and alimentary systems with emphasis on diseases of domestic animals.

VMED 7333 Pharmacology I. Prerequisite(s): Second-year standing in the College of Veterinary Medicine. Introduction of the principles of pharmacodynamics, drug disposition and pharmacokinetics, pharmacological effects of veterinary medicines, methods used in evaluation of disease and toxic effects of drugs acting on the autonomic, central nervous, cardiovascular, respiratory, and renal systems.

VMED 7342 Clinical Anatomy. Prerequisite(s): Second-year standing in the College of Veterinary Medicine. Aspects of gross anatomy as they relate to clinical applications.

VMED 7354 Infectious Diseases I. Prerequisite(s): Second-year standing in College of Veterinary Medicine. Important animal diseases caused by bacteria, fungi and viruses will be covered on a system basis. Mechanisms of infectious disease processes and the relationship of such processes to disease development, diagnosis, treatment and control. The relationship of zoonotic diseases to community and environmental health as well as important zoonoses.

VMED 7363 Clinical Pathology. Lab 1. Prerequisite(s): Second-year standing in the College of Veterinary Medicine. Basic concepts pertinent to data interpretation and laboratory methods used in evaluation of disease.

VMED 7401 Introduction to Beef Production Medicine. Prerequisite(s): Second-year or third-year standing in the College of Veterinary Medicine. This course will provide students with an understanding of the beef production industry in the United States. Students will gain an understanding of the importance of beef production to the US and global food production, the structure and function of the US beef industry, and the role of a veterinarian in beef production medicine. The course will be a combination of lecture and discussion format. If possible, the course will also include field trips to visit examples of the various segments of the beef industry, clinical investigations and toxic effects of drugs acting on the autonomic, central nervous, cardiovascular, respiratory, and renal systems.

VMED 7412 Anesthesiology. Lab 6. Prerequisite(s): Second-year standing in the College of Veterinary Medicine. Application of the principles of veterinary anesthesiology to incorporate fundamental aspects of physiology and pharmacology in the anesthetic management of important domestic species.

VMED 7413 Food Safety and Public Health. Prerequisite(s): Second-year standing in the College of Veterinary Medicine. Principles of diagnosis, treatment, control and prevention of animal diseases produced by bacteria, fungi and viruses will be covered on a system basis. Mechanisms of infectious disease processes and the relationship of such processes to disease development, diagnosis, treatment and control. The relationship of zoonotic diseases to community and environmental health as well as important zoonoses.

VMED 7432 Molecular Genetics. Prerequisite(s): Second-year or third-year standing in good standing in the College of Veterinary Medicine. The expression, purification, characterization, and application of biological macromolecules in therapeutics and diagnostics relevant to animal health.

VMED 7511 Food Animal: Advanced Techniques. Prerequisite(s): Second-year or third-year standing in the College of Veterinary Medicine. Advanced medical endocrinology addressing diagnostic endocrinology and therapeutic endocrinology. Diagnostic endocrinology shall examine the physiological and medical basis for selecting provocative or non-provocative testing procedures as an adjunct to completing a definitive diagnosis. Therapeutic endocrinology involves the use of hormonal preparations to control animal physiology or endocrinology and non-endocrine diseases.

VMED 7512 Laboratory Animal Medicine. Prerequisite(s): Second or third-year standing in the College of Veterinary Medicine. Introductory course focusing on the biology and major diseases of commonly used laboratory animals.

VMED 7515 Veterinary Practice Management. Prerequisite(s): Second-or third-year standing in College of Veterinary Medicine. Skills and background for success as an employee in private veterinary practice. Successful practice depends upon maintaining a value in the practice that is perceived by the medical services, doctor-client communication skills, and aesthetic quality of the environment in which services are delivered. Business management of private practice, personal finances, and personnel management.

VMED 7522 Small Animal Medical Diagnosis; Signs and Symptoms. Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Introduction to clinical problem solving through application of a problem-oriented approach to clinical diagnosis. Discussion of major problems (clinical signs and symptoms) affecting animals, and the pathophysiology of each clinical sign and symptom. Discussion of the various segments of the beef industry, clinical investigations and toxic effects of drugs acting on the autonomic, central nervous, cardiovascular, respiratory, and renal systems.

VMED 7523 Surgery. Lab 48. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Introduction to fundamental principles of surgery. Didactic material followed by surgical laboratories.

VMED 7531 Avian Biology for Veterinarians. Prerequisite(s): Second-or third-year standing in the College of Veterinary Medicine. Topics in avian biology of value to veterinary students who will be treating birds in their practice or those planning to be active in raptor rehabilitation. feather anatomy and molt; bill and claw anatomy; characteristics of the avian skeleton; weight saving adaptations; recondition atrophied flight muscles in raptors; anatomy of the digestive system; how birds breathe; avian aerodynamics; taste and olfaction in birds; reproductive endocrinology. Diagnostic endocrinology shall examine the physiological and medical basis for selecting provocative or non-provocative testing procedures as an adjunct to completing a definitive diagnosis. Therapeutic endocrinology involves the use of hormonal preparations to control animal physiology or endocrinology and non-endocrine diseases.

VMED 7571 Introduction to Behavioral Medicine. Prerequisite(s): Second-or third-year standing in College of Veterinary Medicine. Introduction to the biology and major diseases of commonly used laboratory animals.

VMED 7572 Veterinary Practice Management. Prerequisite(s): Second-or third-year standing in College of Veterinary Medicine. Skills and background for success as an employee in private veterinary practice. Successful practice depends upon maintaining a value in the practice that is perceived by the medical services, doctor-client communication skills, and aesthetic quality of the environment in which services are delivered. Business management of private practice, personal finances, and personnel management.

VMED 7575 Veterinary Medical Diagnosis; Signs and Symptoms. Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Introduction to clinical problem solving through application of a problem-oriented approach to clinical diagnosis. Discussion of major problems (clinical signs and symptoms) affecting animals, and the pathophysiology of each clinical sign and symptom. Discussion of the various segments of the beef industry, clinical investigations and toxic effects of drugs acting on the autonomic, central nervous, cardiovascular, respiratory, and renal systems.

VMED 7576 Veterinary Medical Diagnosis; Signs and Symptoms. Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Introduction to clinical problem solving through application of a problem-oriented approach to clinical diagnosis. Discussion of major problems (clinical signs and symptoms) affecting animals, and the pathophysiology of each clinical sign and symptom. Discussion of the various segments of the beef industry, clinical investigations and toxic effects of drugs acting on the autonomic, central nervous, cardiovascular, respiratory, and renal systems.

VMED 7577 Introduction to Behavioral Medicine. Prerequisite(s): Second-or third-year standing in College of Veterinary Medicine. Introduction to
behavioral veterinary medicine. Normal behavior of the dog and cat, basic procedures and methods for diagnosing and treating behavioral problems.

VMED 7581 Zoo and Wildlife Medicine. Prerequisite(s): third-year standing in the College of Veterinary Medicine. Veterinary and preventive management of captive zoo animals, veterinary care and rehabilitation of injured or orphaned free ranging wildlife.

VMED 7583 Dermatology and Endocrinology. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to skin and the endocrine system (nine-week module).

VMED 7591 International Veterinary Medicine. Prerequisite(s): Second-year or third-year standing in the College of Veterinary Medicine. Overview of the importance of veterinarians and the wide range of activities in which they participate around the world including the military, public health agencies, humanitarian relief agencies, wildlife preservation groups and faith-based agencies.

VMED 7610 Basic Science Elective. 1-8 credits, max 8, Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Problems in the basic sciences taught as lecture or lab.

VMED 7612 Clinical Neurology. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the cardiovascular and respiratory systems.

VMED 7620 Clinical Science Elective. 1-8 credits, max 8, Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Problems in the clinical sciences taught as lecture or lab.

VMED 7631 History of Veterinary Medicine. Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. History of the veterinary medical profession, especially in North America.

VMED 7632 Exercise Physiology. Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Current knowledge base pertaining to the acute and chronic adaptations to exercise in domestic animals and current techniques for the evaluation and correction of poor performance.

VMED 7642 Veterinary Sports Medicine. Prerequisite(s): VMED 7632 and second- or third-year standing in the College of Veterinary Medicine. Course will provide the current knowledge pertaining to the diagnosis and treatment of injuries of athletic dogs and horses and causes of poor performance in these species.

VMED 7651 Equine Theriogenology Laboratory. Lab 3, Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Introduction to palpation, ultrasonographic examination and breeding preparation of the mare reproductive tract.

VMED 7652 Introduction to Clinics II. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Rotations through instructional /service areas including the Veterinary Teaching Hospital of the College of Veterinary Medicine.

VMED 7661 Infectious and Parasitic Diseases of Wild Animals. Lab 11, Prerequisite(s): Second-or-third-year standing in the College of Veterinary Medicine. Systematic approach to infectious and parasitic diseases affecting wild animals. Capture, restraint, and disease recognition in wild species, population management implications of disease diagnosis.

VMED 7662 Urinary System. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Pathogenesis, diagnosis, pathology, medical and surgical treatment and prevention of diseases related primarily to the urinary system.

VMED 7671 Clinical Endocrinology II. Prerequisite(s): Second or third-year standing in the College of Veterinary Medicine. Advanced medical endocrinology, focusing on endocrine diseases associated with (1) dysfunction of the endocrine pancreas, (2) selected endocrineopathies of the reproductive system, and (3) therapeutic use of hormones to control reproductive activity of animals.

VMED 7674 Theriogenology. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the urinary system.

VMED 7681 Advanced Neurology. Prerequisite(s): Second or third-year standing in the College of Veterinary Medicine. Case-based, problem oriented clinical diagnosis, management, treatment and prevention of small animal neurological diseases.

VMED 7682 Small Ruminant Production, Management, Medicine and Surgery. Prerequisite(s): Second or third-year standing in the College of Veterinary Medicine. Production, management, medical and surgical diseases of sheep, goats, and llamas used for production and companion animals.

VMED 7691 A Focus on Zoonotic Diseases. Prerequisite(s): Second or third year standing in the College of Veterinary Medicine or consent of instructor. Overview of zoonotic aspects of infectious diseases, including the transmission to man, incidence and prevalence, prevention and control strategies, assessment of risk, and governmental and regulatory aspects of these public health threats. Diseases of all veterinary species will be balanced according to various aspects of importance, ease of transmission, incidence, and other current concepts.

VMED 7701 Small Animal Diagnostic Ultrasound. Lab 10, Prerequisite(s): Third-year standing in the College of Veterinary Medicine. An introduction to diagnostic ultrasonography, basic physics of ultrasound production, transmission in tissues, images formation and common artifacts. Recognition of normal organs, organ function, and common diseases that can be diagnosed sonographically in small animals.

VMED 7710 Veterinary Study Abroad. Prerequisite(s): Second or Third-year standing in the College of Veterinary Medicine. Participation in international animal health experiences having an educational component either through didactic instruction, service learning, workshop participation, and others.

VMED 7711 Problem-based Ophthalmology. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Case-based, problem-oriented discussions of small animal and equine ophthalmology cases. Key points in the case history, the significance of signalement in the diagnosis, clinical diagnosis, supportive diagnostic tests, and treatment. General discussion of the specific disease following the case discussion.

VMED 7712 Systemic Pathology: Case Studies and Mechanisms of Disease. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Pathogenesis, diagnosis, pathology, medical and surgical treatment, and prevention of diseases related primarily to the cardiovascular and respiratory systems.

VMED 7715 Advanced Dermatology. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Case-based problem oriented clinical diagnosis, management, treatment, and prevention of internal medicine diseases common to small animals. Small group format will meet one hour per week at a time determined by the individual groups.

VMED 7720 Introductory Clinical Laboratory Medicine. Lab 1, Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Palpation techniques in cows. An elective restricted to students entering food animal practice.

VMED 7761 Introduction to Integrative Medicine: An Investigation into Holistic Veterinary Medicine. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. This course will provide an overview of different modalities being used as alternative therapies in Veterinary Medicine. The student will gain an appreciation for the importance of complementary medicine, and the evidence available to support its use. Students will also gain an understanding of critically assessing the research available and determining whether the information is clinically relevant.

VMED 7771 Advanced Equine Medicine I. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Expanded study of topics pertinent to equine practice. Supplements information presented in core sources and aims to provide exposure to basic clinical techniques commonly used in equine practice. A clinical practice perspective will be emphasized. Hands-on laboratories will be used as an adjunct to lectures when appropriate. A companion course will be presented during spring semester. Graded on a pass-fail basis.

VMED 7781 Professional Veterinary Medicine. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. A capstone course preparing third-year veterinary students for clinical training. Topics include: non-technical skills, knowledge, aptitudes, and attitudes; veterinary career opportunities in public practice, and preparation for the North American Veterinary Licensing Examination (NAVLE).

VMED 7791 Case Studies in Small Animal Dermatology. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Clinic conference/rounds on dermatology cases. Includes histopathology. Computer/multi-media applications will be used.

VMED 7801 Business Management for Veterinary Practice. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Course based, problem oriented clinical diagnosis, management, treatment and prevention of small animal neurological diseases.

VMED 7811 Advanced Equine Medicine II. Prerequisite(s): Third-year standing in the College of Veterinary Medicine and VMED 7771. A continuation of 7771. Expanded study of topics pertinent to equine practice. Supplements information presented in core sources and aims to provide exposure to basic clinical techniques commonly used in equine practice. A clinical practice perspective will be emphasized. Hands-on laboratories will be used as an adjunct to lectures when appropriate. Graded on a pass-fail basis.
VMED 7821 Equine Radiology. Lab 12. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Diagnostic imaging (radiology, nuclear scintigraphy and ultrasound) of horses.

VMED 7822 Food Animal Production Medicine. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Production animal agriculture and the veterinarian’s present and future role in these enterprises. Cattle production is emphasized. Cycles of production, economics and health programs will be discussed. For students intending to enter mixed animal or exclusive food animal practices.

VMED 7831 Advanced Small Animal Medicine II: Problem-Based Learning. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Case-based, problem oriented clinical diagnosis, management, treatment, and prevention of internal medicine diseases common to small animals. Small group format will meet one hour weekly at a time determined by the individual groups.

VMED 7841 Food Animal Surgery. Lab 9. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Detailed examination and review of commonly utilized local anesthetic techniques, injectable anesthetic techniques, and surgical procedures in food animal practice. Major topics include digital, mammary, gastrointestinal, and urethral surgery as well as cesarean section.


VMED 7861 Cytology. Lab 2. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. An introduction to clinical diagnosis using cytology. Topics include sample collection, inflammatory lesions, neoplasia, lymph node cytology, respiratory washes, synovial fluids, and body cavity effusions. The course consists of lectures, multi-head microscope and individual microscope laboratories; cases will be predominantly small animals.

VMED 7871 Advanced Equine Reproduction. Lab 3. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. The practical application of recent research in the breeding management, estrous cycle manipulation, and reproductive disease diagnosis and treatment of the mare. The stallion will be studied with respect to semen quality, endocrine-associated infertility, and breeding accidents and injuries.

VMED 7872 Special Surgical Problems and Techniques, Advanced Small Animal Orthopedics and Neurosurgery. Lab 12. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Diagnosis and surgical management of small animal orthopedic and neurological diseases. Lecture and laboratory format.

VMED 7891 Equine Surgical Laboratory. Lab 12. Prerequisite(s): Third-year standing in the College of Veterinary Medicine. Surgical techniques directly supervised by the instructor. Fundamental enclosed surgical techniques. Abdominal procedures on live animals. Orthopedic procedures on cadaveric limbs.

VMED 7933 Diagnostics. Lab 9. Prerequisite(s): Fourth-year standing in the College of Veterinary Medicine. Participation in animal necropsy, clinical pathology, clinical parasitology, and other investigative methods to study diagnosis, prognosis, prevention, and treatment of animals.

VMED 7941 Clinical Skills Outcomes Assessment. Prerequisite(s): Fourth year standing in the College of Veterinary Medicine. Assessment of clinical skills using checklists and/or brief case summaries.
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