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- College of Architecture and Design
- College of Arts and Sciences
- College of Business Administration
- College of Communications
- College of Education
- College of Engineering
- College of Human Ecology
- College of Law
- College of Nursing
- College of Social Work
- College of Veterinary Medicine

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#### Summer Term 2000

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<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1 (Thurs)</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>July 4 (Tues)</td>
<td>Independence Day</td>
</tr>
<tr>
<td>July 5 (Wed)</td>
<td>First Session Ends</td>
</tr>
<tr>
<td>July 6 (Thurs)</td>
<td>Second Session Begins</td>
</tr>
<tr>
<td>August 9 (Wed)</td>
<td>Second Session Ends</td>
</tr>
<tr>
<td>August 11 (Fri)</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

#### Fall Semester 2000

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 23 (Wed)</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>September 4 (Mon)</td>
<td>Labor Day</td>
</tr>
<tr>
<td>October 12-13 (Thurs-Fri)</td>
<td>Fall Break</td>
</tr>
<tr>
<td>November 23-24 (Thurs-Fri)</td>
<td>Thanksgiving</td>
</tr>
<tr>
<td>December 7 (Thurs)</td>
<td>Classes End</td>
</tr>
<tr>
<td>December 8 (Fri)</td>
<td>Study Period</td>
</tr>
<tr>
<td>December 9-11-14</td>
<td>Final Exams</td>
</tr>
<tr>
<td>December 16 (Sat)</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

#### Spring Semester 2001

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 10 (Wed)</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>January 15 (Mon)</td>
<td>Martin Luther King Day</td>
</tr>
<tr>
<td>March 19-23 (Mon-Fri)</td>
<td>Spring Break</td>
</tr>
<tr>
<td>April 23 (Fri)</td>
<td>Spring Recess</td>
</tr>
<tr>
<td>April 30 (Mon)</td>
<td>Classes End</td>
</tr>
<tr>
<td>May 1-2 (Tues-Wed)</td>
<td>Study Period</td>
</tr>
<tr>
<td>May 3-5, 7-8 (Thurs-Sat, Mon-Tues)</td>
<td>Final Exams</td>
</tr>
<tr>
<td>May 9-29</td>
<td>MiniTerm</td>
</tr>
<tr>
<td>May 11 (Fri)</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

#### Summer Term 2001

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 31 (Thurs)</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>July 3 (Tues)</td>
<td>First Session Ends</td>
</tr>
<tr>
<td>July 4 (Wed)</td>
<td>Independence Day</td>
</tr>
<tr>
<td>July 5 (Thurs)</td>
<td>Second Session Begins</td>
</tr>
<tr>
<td>August 8 (Thurs)</td>
<td>Second Session Ends</td>
</tr>
<tr>
<td>August 10 (Fri)</td>
<td>Commencement</td>
</tr>
</tbody>
</table>

**NOTE:** Deadlines for degree requirements are at end of section on Degree Program Requirements.
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June 1, 2002

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TERMEXPIRES
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TERMEXPIRES
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TERMEXPIRES
June 1, 2001
June 1, 2001

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TERMEXPIRES
June 1, 2002
June 1, 2002

TERMEXPIRES
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June 1, 2002

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June 1, 2002

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July 1, 2000

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William Blass

TERMEXPIRES
July 1, 2000

Officers of the Board
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DISTRICT
TERMEXPIRES

First
June 1, 2001

Second
June 1, 2001

Third
June 1, 2002

Fourth
June 1, 2002

Fifth
June 1, 2003

Sixth
June 1, 2005

Seventh
June 1, 2005

Eighth
June 1, 2002

Ninth
June 1, 2001

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Robert Leiter, B.S., M.C., Ed.D., Dean of University Outreach and Continuing Education
Richard L. Boyer, B.A., M.A., Dean of Admissions (Undergraduate) and Records
Aubrey Mitchell, B.S., M.S., Interim Dean of University Libraries
The Graduate School Administration

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Michael Singletary, B.A., M.A., Ph.D., Associate Dean of The Graduate School
Jan Allen, B.S., M.S., Ph.D., Assistant Dean of The Graduate School

S. Kay Reed, B.S., M.S., M.A., Ph.D., Assistant to the Dean
Diana C. Lopez, B.S., M.S., Director, Graduate Admissions and Records

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Dr. Herb Howard, College of Communications
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Dr. Jim Lewis, UT Space Institute

College or Unit    Elected Members    Expiration    Proxy

Agric. Sci. & Natural Resources    Dr. James D. Godkin    July 31, 2001    Dr. Robert M. Auge
                                   Mr. Jon Coddington    July 31, 2001    Mr. Max Robinson

Architecture & Planning    Dr. Lyle W. Konigsberg    July 31, 2000    Dr. L. J. DeCuir
                           Dr. Wesley G. Morgan    July 31, 2000    TBD
                           Dr. David C. Wilson    July 31, 2000    TBD
                           Dr. Michael Benson    July 31, 2001    Dr. Charles Aiken
                           Dr. Ziling Xue    July 31, 2001    Dr. Charles Felgerle
                           Dr. Mike Lofaro    July 31, 2002    Mr. James Spencer
                           Dr. Tom Hood    July 31, 2002    Dr. Joel Lubar

Business Administration    Dr. Henry Herzog    July 31, 2000    Dr. George Philippatos
                            Dr. Amy Ray    July 31, 2001    Dr. Dan Murphy

Communications    Dr. Barbara Moore    July 31, 2002    Dr. Ed Caudill

Education    Dr. Lewis Hodge    July 31, 2000    Dr. James Miller
             Dr. Jeff Aper    July 31, 2001    TBD
             Dr. Kathleen Davis    July 31, 2001    TBD
             Dr. Karl Jost    July 31, 2001    Dr. Dianne Whitaker
             Dr. Sharon Judge    July 31, 2002    Dr. David Bassett
             Dr. Dennie Kelley    July 31, 2002    Dr. Grady Bogue

Engineering    Dr. Wayne Davis    July 31, 2000    Dr. Walter L. Green
               Dr. Arun Chatterjee    July 31, 2001    Dr. Jack Lawler
               Dr. Belle Upadhyaya    July 31, 2001    Dr. Rajiv Dubey

Graduate Student Association    Mr. Lyle Culver    April 30, 2000    Dr. Dileep Sachan
                                Mr. Jay McQueen    April 30, 2000    Dr. Randy Bressee
                                Ms. Susan North    April 30, 2000

Human Ecology    Dr. Jacky DeJonge    July 31, 2001    Dr. Dileep Sachan
                 Dr. Charles Hamilton    July 31, 2002    Dr. Randy Bressee

Law    Ms. D. Cheryn Picquet    July 31, 2000    Ms. Melinda Davis

Nursing    Dr. Debra Wallace    July 31, 2001    Dr. Martha Alligood

School of Information Sciences    Dr. Richard Pollard    July 31, 2000    Dr. Gretchen Whitney

Social Work    Dr. Tom Cruthirds    July 31, 2001    Dr. John Orme
               Dr. Bill Nugent    July 31, 2001    Dr. Marys Staudt

UT Space Institute    Dr. Basil Antar    July 31, 2001    Dr. Kenneth Kimble

Veterinary Medicine    Dr. David Staunson    July 31, 2000    TBD
GRADUATE
STUDY
Rules, policies, fees, and courses described in this catalog are subject to change without notice. Refer to inside front cover.
The University of Tennessee is the official land-grant institution for the State of Tennessee, with its main campus in Knoxville. UT is the state's largest and most comprehensive institution, and is the only state-supported "Research University I" (Carnegie classification) in Tennessee. The University of Tennessee is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, GA 30033-4097; Telephone number 404-679-4501) to award the bachelor's, master's and doctoral degrees.

A wide range of graduate programs leading to master's and doctoral degrees is available. The University offers master's programs in 76 fields, the Educational Specialist degree, doctoral work in 44 fields, and 2 professional programs. More than 6,400 graduate and professional students are enrolled on and off campus under the tutelage of 1,500 faculty members.

The Graduate School brings together faculty and graduate students as a community of scholars with a common interest in creative work and advanced study. Programs are available to individuals desiring work toward the master's and doctoral degrees or professional certification, those interested in continuing education for updating and broadening their knowledge, and those pursuing postdoctoral research. Serving the needs of students engaged full-time in intensive study and pursuit of a degree continues to be a major emphasis of UT's graduate effort. Increasingly the University employs a variety of modes, traditional and non-traditional, in offering quality programs designed to serve a diverse student clientele.

The Graduate School includes the Graduate Council; the Graduate School administrative organization, composed of the Graduate Office and the Office of Graduate Admissions and Records; administrators of the various graduate programs; the graduate faculty; and the graduate student body.

The Graduate Council is composed of elected faculty representatives from each college, the Space Institute, and the Graduate Student Association. Ex-officio members include the Dean and the Associate and Assistant Deans of The Graduate School, the Chair of the Research Council, the Dean of Libraries, the Dean of Continuing Education, and the administrative officer having primary responsibility for the graduate curriculum in each college or school.

The Graduate Council is responsible for standards of admission, retention and graduation, and for curricular matters in graduate programs; the development of interdisciplinary programs; approval of new graduate programs; approval of individuals to direct doctoral dissertation research; financial support of graduate students; and all other matters of educational policy pertaining to graduate programs. Standing committees include academic policy, appeals, credentials, curriculum, and the Graduate Deans Group.

The Graduate School administration develops procedures to implement policies formulated by the Council, and has primary responsibility for Graduate School admissions and records. Much of the day-to-day administration of graduate study is conducted by department heads or faculty advisors and committees responsible for particular programs. In addition to departmental units, numerous interdisciplinary programs, institutes and centers have been developed on campus and in locations throughout the state.

The graduate student body is composed of those persons admitted to graduate study by The Graduate School, upon recommendation of the academic unit, and currently enrolled in The Graduate School.

Graduate education has been conducted at The University of Tennessee since 1821. The first known master's degree was awarded in 1827. In 1879 the Board of Trustees created a graduate department with authority to confer the Master of Arts, the Doctor of Philosophy, Civil Engineer, and Mining Engineer degrees. The Graduate Department was renamed The Graduate School in 1912. Although a Ph.D. degree was awarded in 1886 and in 1887, formal doctoral programs were not instituted until 1929 for Biological Sciences at Memphis and 1943 for Chemistry on the Knoxville campus. A Committee on Graduate Study was appointed in 1904 and coordinated the graduate programs until the Graduate Council was formed in 1949. More than 8,600 doctoral degrees and 50,600 master's degrees have been awarded to date.

Seven deans have led The Graduate School since 1936: Fred C. Smith, Eugene A. Waters, Dale K. Wantling, Hilton A. Smith, Jack E. Reese, Margaret N. Perry, and C.W. Minkel. They have strived to maintain the rich heritage and the highest quality of graduate programs at UT.
### Graduate Majors and Degree Programs

Below is a list of all graduate degree programs offered at The University of Tennessee. A degree is awarded upon completion of a specified program of study in a major field. Degree titles are posted on transcripts and diplomas. Major titles are posted on transcripts. A formally approved subcomponent of a degree program is a concentration. Select ONE of these majors and degrees. Enter your preference on the Graduate School application (orange form) under Type of Admission. Please contact the program you have selected for additional information.

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ'D</th>
<th>LANGUAGE REQ'D</th>
<th>CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College of Agricultural Sciences &amp; Natural Resources</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural &amp; Extension Education*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Agricultural education, agricultural extension education. (974-7371, <a href="mailto:fleswey@utk.edu">fleswey@utk.edu</a>)</td>
</tr>
<tr>
<td>Agricultural Economics*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>MS &amp; PHD-agribusiness, agricultural economics, rural sociology. (974-7231, <a href="mailto:jbrooker@utk.edu">jbrooker@utk.edu</a>)</td>
</tr>
<tr>
<td>Animal Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-animal breeding, animal management, animal nutrition, animal physiology. PHD only-animal anatomy. (974-7206, <a href="mailto:jgodkin@utk.edu">jgodkin@utk.edu</a>)</td>
</tr>
<tr>
<td>Biosystems Engineering*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>PHD-agricultural electrical &amp; electronic systems, agricultural power &amp; machinery, agricultural structures &amp; environment, food &amp; process engineering, soil &amp; water conservation engineering. (974-7206, <a href="mailto:abed@utk.edu">abed@utk.edu</a>)</td>
</tr>
<tr>
<td>Biosystems Engineering Technology*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Entomology &amp; Plant Pathology*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Entomology, plant pathology. Evaluate Mar 15 for Fall and Summer, Oct 15 for Spring. (974-7135, <a href="mailto:rgerhard@utk.edu">rgerhard@utk.edu</a>)</td>
</tr>
<tr>
<td>Food Science &amp; Technology*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>PHD-food chemistry, food microbiology, food processing, sensory evaluation of foods. (974-7247, <a href="mailto:dgolden@utk.edu">dgolden@utk.edu</a>)</td>
</tr>
<tr>
<td>Forestry*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>(974-7126, <a href="mailto:hopper@utk.edu">hopper@utk.edu</a>)</td>
</tr>
<tr>
<td>Ornamental Horticulture &amp; Landscape Design*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>Floriculture, landscape design, public horticulture, turfgrass, woody ornamentals. (974-7324, <a href="mailto:tstarman@utk.edu">tstarman@utk.edu</a>)</td>
</tr>
<tr>
<td>Plant &amp; Soil Sciences*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-crop physiology &amp; ecology, plant breeding &amp; genetics, soil science. (974-8618, <a href="mailto:messington@utk.edu">messington@utk.edu</a>)</td>
</tr>
<tr>
<td>Wildlife &amp; Fisheries Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td><strong>College of Architecture &amp; Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>First professional degree. Admit Summer and Fall only. Evaluate Feb 1. (974-3285, <a href="mailto:jcodding@utk.edu">jcodding@utk.edu</a>)</td>
</tr>
<tr>
<td>Architecture*</td>
<td>MArch + G</td>
<td>3</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>College of Arts and Sciences</strong></td>
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</tr>
<tr>
<td>Anthropology</td>
<td>MA + G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MA &amp; PHD-archaeology, biological anthropology, cultural anthropology, zooarchaeology. Admit Fall only. Evaluate Jan 15. (974-4408, <a href="mailto:oipatton@utk.edu">oipatton@utk.edu</a>)</td>
</tr>
<tr>
<td>Art*</td>
<td>MFA</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Ceramics, drawing, graphic design, media arts, painting, printmaking, sculpture, watercolor, inter-area studies. Portfolio required. (974-3468, <a href="mailto:chodge@utk.edu">chodge@utk.edu</a>)</td>
</tr>
<tr>
<td>Audiology*</td>
<td>MA + G</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Admit Fall only. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
</tr>
<tr>
<td>Biochemistry and Cellular and Molecular Biology*</td>
<td>MS + G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>MS &amp; PHD-anatomy, biochemistry, cell biology, molecular biology, neuroscience, neuroanatomy, etc. Admit Fall only. Evaluate Jan 15. (974-3468, <a href="mailto:chodge@utk.edu">chodge@utk.edu</a>)</td>
</tr>
<tr>
<td>Botany*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MS &amp; PHD-plant biology, physiology, taxonomy, systematics, ecology, plant physiology. Admit Fall only. Evaluate Jan 15. (974-2256, <a href="mailto:oschwartz@utk.edu">oschwartz@utk.edu</a>)</td>
</tr>
<tr>
<td>Chemistry*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>MS &amp; PHD-organic chemistry, environmental chemistry, inorganic chemistry, physical chemistry, polymer chemistry. Admit Fall only. Evaluate Jan 15. (974-2256, <a href="mailto:oschwartz@utk.edu">oschwartz@utk.edu</a>)</td>
</tr>
<tr>
<td>Computer Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecology and Evolutionary Biology*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-ecology, evolutionary biology, systematics, genetics, paleoecology, paleobiology. Admit Fall only. Evaluate Jan 15. (974-3468, <a href="mailto:chodge@utk.edu">chodge@utk.edu</a>)</td>
</tr>
<tr>
<td>English*</td>
<td>MA + G</td>
<td>3</td>
<td>X</td>
<td>X</td>
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<td>MA-writing, degree-seeking students only. Admit Fall only. Evaluate Feb 15. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
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<td>French*</td>
<td>MA</td>
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<td>See Modern Foreign Languages for PHD. (974-7602, <a href="mailto:jromeise@utk.edu">jromeise@utk.edu</a>)</td>
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<tr>
<td>Geography*</td>
<td>MS + G</td>
<td>3</td>
<td>X</td>
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<td>Evaluate assistantship applications Feb 15. (974-2418, <a href="mailto:utkgeog@utk.edu">utkgeog@utk.edu</a>)</td>
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<td>Geology*</td>
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<td>X</td>
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<td>See Modern Foreign Languages for PHD. (974-3441, <a href="mailto:lauckner@utk.edu">lauckner@utk.edu</a>)</td>
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<tr>
<td>German*</td>
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<td>THESIS REQ'D.</td>
<td>LANGUAGE REQ'D</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>PHD-american, european. Admit Fall only. Evaluate Feb 15. (974-5421, <a href="mailto:phamilto@utk.edu">phamilto@utk.edu</a>)</td>
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<tr>
<td>Life Sciences*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MS &amp; PHD-genome science and technology, plant physiology &amp; genetics. (974-1531, <a href="mailto:russellg@utk.edu">russellg@utk.edu</a>)</td>
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<tr>
<td>Mathematics*</td>
<td>MA</td>
<td>G</td>
<td>3</td>
<td>X</td>
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<td></td>
<td>MS-applied mathematics. PHD-mathematical ecology. (974-2404, <a href="mailto:gradprogram@math.utk.edu">gradprogram@math.utk.edu</a>)</td>
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<td>MS</td>
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<td>X</td>
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<td>(974-3441, <a href="mailto:gvwester@utk.edu">gvwester@utk.edu</a>)</td>
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<tr>
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<td>PHD</td>
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<td>X</td>
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<td>First concentration-French, German, Spanish. Second concentration-applied linguistics, French, German, Italian, Portuguese, Russian, Spanish. (974-3421, <a href="mailto:laudner@utk.edu">laudner@utk.edu</a>)</td>
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<td>Music*</td>
<td>MM</td>
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<td>Accompanying, choral conducting, composition, instrumental conducting, jazz, music education, music theory, musicology, performance, piano pedagogy &amp; literature. Audition required. (974-3331, <a href="mailto:canders@utk.edu">canders@utk.edu</a>)</td>
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<tr>
<td>Philosophy*</td>
<td>MA</td>
<td>G</td>
<td>3</td>
<td>X</td>
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<td></td>
<td>MA &amp; PHD-medical ethics, philosophy. MA only-religious studies. Admit Fall only. (974-3255, <a href="mailto:holt@utk.edu">holt@utk.edu</a>)</td>
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<td>Physics*</td>
<td>MS</td>
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<td>3</td>
<td>X</td>
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<td>MS &amp; PHD-astrophysics, atomic &amp; low temperature physics, biophysics, chemical physics, condensed matter &amp; surface physics, elementary particle physics, molecular spectroscopy, nuclear physics, theoretical physics. MS only-geophysics, health physics. Rating forms required only for consideration for teaching assistantships. (974-3342, <a href="mailto:shan@utk.edu">shan@utk.edu</a>)</td>
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<td>Planning*</td>
<td>MSP</td>
<td>G</td>
<td>2</td>
<td>X</td>
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<td>Environmental planning, land use planning, real estate development planning, transportation planning. Admit Summer and Fall only. (974-3327, <a href="mailto:dph@utk.edu">dph@utk.edu</a>)</td>
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<td>Political Science*</td>
<td>MA</td>
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<td>X</td>
<td></td>
<td>MA-experimental psychology, general psychology. PHD-clinical psychology, experimental psychology. Admit Fall only. Evaluate Feb 15. (974-3328, <a href="mailto:napfcae@utk.edu">napfcae@utk.edu</a>)</td>
</tr>
<tr>
<td>Psychology*</td>
<td>MA</td>
<td>G</td>
<td>4</td>
<td>X</td>
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<td>Dual JD-MFA program available. (974-2261, <a href="mailto:dco@utk.edu">dco@utk.edu</a>)</td>
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<tr>
<td>Public Administration*</td>
<td>MPA</td>
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<td>X</td>
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<td>MA &amp; PHD-nuclear economy, energy, environment &amp; resource policy; political economy. Admit Fall only. Evaluate Feb 15. (974-7032, <a href="mailto:rgperrin@utk.edu">rgperrin@utk.edu</a>)</td>
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<td>Sociology*</td>
<td>MA</td>
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<td>See Modern Foreign Languages for PHD. (974-7005, <a href="mailto:orrier@utk.edu">orrier@utk.edu</a>)</td>
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<td>Audiology, hearing science, speech &amp; language pathology, speech-language science. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
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<td>Speech &amp; Hearing Science*</td>
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<td>Admit Fall only. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
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<td>Costume design, international performance studies in acting, international performance studies in directing, lighting design, scene design, theatre technology. Audition required. (974-6011, <a href="mailto:laudeur@utk.edu">laudeur@utk.edu</a>)</td>
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<td>Theatre*</td>
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<tr>
<td>College of Business Administration</td>
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<td>MAcc</td>
<td>+GMAT</td>
<td>2</td>
<td>X</td>
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<td>Financial auditing, systems, taxation. Evaluate Mar 1. (974-2551, <a href="mailto:rtwennis@utk.edu">rtwennis@utk.edu</a>)</td>
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<tr>
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<td>+GMAT</td>
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<td>MBA-economics, environmental management, finance, forest industries management, global business, logistics &amp; transportation, management, manufacturing management, marketing, new venture analysis &amp; entrepreneurship, statistics. PHD-accounting, finance, logistics &amp; transportation, management, marketing, statistics. Admit Fall only. Evaluate Mar 1. Dual JD-MBA, MS-MBA, Executive MBA, BA/ MBA, Professional MBA programs available. (974-5033, <a href="mailto:mba@utk.edu">mba@utk.edu</a>)</td>
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<td>Economics*</td>
<td>MA</td>
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<td>X</td>
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<td>GMAT may be substituted for GRE. Admit Fall only. Evaluate Feb 1. (974-1697, <a href="mailto:dkmijo@utk.edu">dkmijo@utk.edu</a>)</td>
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<tr>
<td>Industrial &amp; Organizational Psychology*</td>
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<td>X</td>
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<td>Admit Fall only. Evaluate Feb 1. Use forms obtained from department. Degree-seeking students only. (974-4843, <a href="mailto:jtrbov@utk.edu">jtrbov@utk.edu</a>)</td>
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<tr>
<td>Statistics*</td>
<td>MS</td>
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<td>2</td>
<td>X</td>
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<td>GMAT may be substituted for GRE. (974-4116, <a href="mailto:jmoser@utk.edu">jmoser@utk.edu</a>)</td>
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<td>College of Communications</td>
<td>MS</td>
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<td>3</td>
<td>X</td>
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<td></td>
<td>MS &amp; PHD-advertising, broadcasting, journalism, public relations, speech communication. PHD only-information sciences. Admit Fall only. (974-9651, <a href="mailto:colcomgs@utk.edu">colcomgs@utk.edu</a>)</td>
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</table>
### College of Education

**College Student Personnel**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

Evaluate Mar 15. (974-0906, mlw@utk.edu)

Mental health counseling, rehabilitation counseling, school counseling. Evaluate Feb 1 and Nov 1. (974-0906, mlw@utk.edu)

**Education I**
- **Degree:** PHD
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

CONCENTRATIONS AVAILABLE

- **EVALUATION DATES/PHONE (AREA CODE: 865)**
  - MS Track 1 (those who are already licensed)
    - art education, curriculum, education of the deaf and hard of hearing, elementary education
    - English education, foreign language/ESL education, instructional technology, mathematics education, modified & comprehensive special education, reading education, science education, social foundations, special education, early childhood
  - MS Track 2
    - elementary teaching, mathematics education, modified & comprehensive special education, secondary teaching, special education, early childhood, EDS-curriculum, educational administration & supervision, English education, foreign language/ESL education, instructional technology, mathematics education, reading education, school counseling, school psychology, social science education, social science education, special education, early childhood
  - EDD-curriculum, educational administration & policy studies, educational psychology, literacy, language education, and ESL education, teacher education.

**Evaluations**
- **Jan 1** and **Feb 1**.

**Education II**
- **Degree:**
  - MS +
  - EDS
  - EDD
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1** and **Feb 1**.

**Educational Administration & Policy Studies**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jun 1**.

**Educational Psychology**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Human Performance & Sport Studies**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1** and **Feb 1**.

### College of Engineering

**Aerospace Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Chemical Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Civil Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Electrical Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Engineering Science**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Environmental Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Industrial Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Mechanical Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Metallurgical Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Nuclear Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.

**Polymer Engineering**
- **Degree:** MS
- **GRE:** G
- **Rating Form:** 3
- **Dept. Req.:** X
- **Thesis Req.:** X
- **Language Req.:**

**Evaluations**
- **Jan 1**.
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<th>THESIS REQ.</th>
<th>LANGUAGE REQ.</th>
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<td>Child &amp; Family Studies*</td>
<td>MS</td>
<td>G</td>
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<td>Child and family studies, early childhood education. Evaluate Feb 1, Jun 1, Nov 1. (974-5316, <a href="mailto:cfs@utkux.utco.utk.edu">cfs@utkux.utco.utk.edu</a>)</td>
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<td>Health Promotion &amp; Health Education</td>
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<td>Evaluate Feb 1, April 1 and Sept 1. (974-5041, <a href="mailto:hastings@utk.edu">hastings@utk.edu</a>)</td>
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<td>Child and family studies, community health, human resource development, nutrition science, retail &amp; consumer sciences, textile science. Evaluate Feb 1, Jun 1, Nov 1. (974-5224, <a href="mailto:bcollier@utk.edu">bcollier@utk.edu</a>)</td>
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<td>Human Resource Development</td>
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<td>Teacher licensure (does not require test scores or rating forms, but does require admittance to teacher education), training and development (MAT also accepted). Evaluate Feb 1, Jan 1, and Nov 1. (974-2574, <a href="mailto:hrd@utk.edu">hrd@utk.edu</a>)</td>
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<td>MS</td>
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<td>3</td>
<td>X</td>
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<td></td>
<td>Nutrition science, public health nutrition. Evaluate Feb 1, May 1 and Oct 1. Dual MS-MPH program available. (974-5445, <a href="mailto:cyates1@utk.edu">cyates1@utk.edu</a>)</td>
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<td></td>
<td>Community health education, gerontology, health planning/administration. Admit Summer and Fall only. Fall deadline - Apr 1, Summer deadline - Feb 1. Dual MS-MPH program available. (974-5674, <a href="mailto:cbhamilton@utk.edu">cbhamilton@utk.edu</a>)</td>
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<td>Recreation, Tourism, &amp; Hospitality Management</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
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<td></td>
<td>Hospitality management, recreation administration, therapeutic recreation, tourism. (974-2141, <a href="mailto:nbfair@utk.edu">nbfair@utk.edu</a>)</td>
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<td>Safety Education &amp; Service</td>
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<td>(974-5041)</td>
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<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
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<td>Retail and consumer sciences, textile science. Evaluate Feb 1, Jun 1, Nov 1. (974-2141, <a href="mailto:nbfair@utk.edu">nbfair@utk.edu</a>)</td>
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<tr>
<td>Law*</td>
<td>JD</td>
<td>LSAT</td>
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<td>Advocacy &amp; dispute resolution, business transactions. Contact College of Law for Bulletin. Dual JD-MBA and JD-MPA programs available. (974-4131)</td>
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<td>3</td>
<td>X X</td>
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<td></td>
<td>MSN-adult health nursing, family nurse practitioner, mental health nursing, nursing administration, nursing of women and children. Evaluate Oct 1 and Feb 1. (MSN-974-7608, <a href="mailto:stuservices@cn.gw.utk.edu">stuservices@cn.gw.utk.edu</a>) (PHD-974-7551, <a href="mailto:athomas@utk.edu">athomas@utk.edu</a>)</td>
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<td>MSSW</td>
<td>G</td>
<td>3</td>
<td>X</td>
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<td>MSSW-clinical social work practice, social welfare management &amp; community practice. Programs offered in Knoxville, Memphis and Nashville. Evaluate Mar 1. Post-master's certificate in management and community practice also available. (MSSW-974-6697, <a href="mailto:snash@utk.edu">snash@utk.edu</a>) (PHD-974-5481, <a href="mailto:ckillion@utk.edu">ckillion@utk.edu</a>)</td>
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<td><strong>College of Veterinary Medicine</strong></td>
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<tr>
<td>Veterinary Medicine*</td>
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<td>Contact College of Veterinary Medicine for application. (974-7263, <a href="mailto:jbrace@utk.edu">jbrace@utk.edu</a>)</td>
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<tr>
<td><strong>School of Information Sciences</strong></td>
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<td>Distance education available. Evaluate July 1, Dec 1 and Apr 1. See College of Communications for PHD. (974-2149, <a href="mailto:hoemann@utk.edu">hoemann@utk.edu</a>)</td>
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<td>Aviation Systems*</td>
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<td>Only offered at UT Space Institute, Tullahoma, Tennessee.</td>
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<td>Comparative &amp; Experimental Medicine*</td>
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<td>Evaluate Apr 15 - Summer, Jul 1 - Fall, Nov 15 - Spring. Will accept early applications (974-5576, <a href="mailto:potgieter@utk.edu">potgieter@utk.edu</a>)</td>
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Admission Requirements

Admission to The Graduate School requires a Bachelor’s degree with a satisfactory grade-point average from a college or university accredited by the appropriate regional accrediting agency or foreign equivalent. Admission to The Graduate School does not constitute acceptance into a specific degree program or admission to candidacy for the degree desired.

The Graduate School requires a minimum grade-point average of 2.7 out of a possible 4.0, or a 3.0 during the senior year of undergraduate study. Applicants with previous graduate work must have a grade-point average of 3.0 on a 4-point scale or equivalent on all graduate work. Many programs require a higher average. Applicants with work experience or who are entering graduate school after a number of years away from an educational institution, usually 5 years, will be given consideration with greater flexibility relative to GPA. An international student graduating from a U.S. institution must meet the same requirements as those for domestic students.

An applicant whose GPA falls between 2.5 and 2.7 may be admitted on probation, upon recommendation of the academic unit. The probationary status will be removed after completion of nine or more hours of graduate credit with a minimum GPA of 3.0. Failure to maintain a 3.0 while in this status will result in dismissal from The Graduate School. An international student may not be admitted on probation.

The stated criteria are minimums. The actual averages required for admission may be higher, depending on the number and the qualifications of applicants.

When a student is admitted to The Graduate School prior to having received the baccalaureate degree, that degree must be awarded before the date of first registration in The Graduate School.

The Office of Graduate Admissions and Records must be notified of any change in the entering date after admission has been granted. Individual departments and colleges may have further restrictions on admission dates. For this information, students should contact the department they wish to enter, if a student does not enroll within one year after the requested admission, the application process must be repeated.

Enrollment in The Graduate School is a privilege which may be withdrawn by the University, or any area of graduate study, if it is deemed necessary by the Dean of The Graduate School to safeguard the University’s standards.

Admission Classes

To earn graduate credit, a student must be admitted by the Dean of The Graduate School and enrolled in one of the categories listed below. See Registration and Enrollment Requirements for provisions concerning graduate credit and for special privileges for UT seniors and professional students. International students should also refer to the section on Admission of International Students.

DEGREE ADMISSION

Admission to a degree program requires that a person meet the minimum requirements of The Graduate School and any additional program requirements (see Admission Requirements). Apart from the department of instruction for specific requirements for admission to the degree program.

In addition to meeting the minimum requirements for admission to The Graduate School, applicants at the doctoral level must have demonstrated potential for superior academic performance. To be considered are such criteria as performance in prior undergraduate and/or graduate studies, achievement on graduate admission tests, letters of recommendation from professors familiar with the applicant’s capabilities, and other evidence of scholarly achievement.

A student must maintain a 3.0 grade-point average to continue enrollment in a degree program (see Academic Standards). An applicant may not be admitted simultaneously to more than one degree program. Two or more applications cannot be considered concurrently. For admission to dual programs, applications are processed consecutively.

NON-DEGREE ADMISSION

Applicants may apply for non-degree status who, for example:
1. need additional time to fulfill application requirements for a degree program.
2. do not wish to pursue a degree program.

Admission to the non-degree status requires that a person meet the minimum requirements of The Graduate School (see Admission Requirements).

A major area must be declared if the intent is to seek an advanced degree. If no degree is desired, a major area need not be declared, but the student must complete a minimum of one semester of graduate coursework in the major area.

There is no specific limit on the number of courses that a student may take in non-degree status. However, before accumulating 15 hours of graduate coursework in this status, the student must either:
1. apply and be admitted to a specific degree program (see Revision of Admission Requirements); or
2. submit a Plan of Study form to the Associate Dean of The Graduate School for approval to continue taking courses in non-degree status. The plan of study must include a stated educational objective and a list of courses proposed to achieve that objective.

A maximum of 15 graduate hours taken before acceptance into a degree program may be applied toward a graduate degree, if approved by the student’s committee. Courses applied toward any graduate degree must fall within the time limit specified for the degree.

Any graduate student must meet with an academic advisor at least once each semester to discuss his/her program. For non-degree students with a declared major, the advisor must be from the appropriate academic unit. If no advisor has been assigned, the department head or designee is the advisor. For a non-degree student who has no declared major, the Associate Dean of The Graduate School, or designee, is the advisor.

A student must maintain a 3.0 grade-point average to continue enrollment in non-degree status (see Academic Standards).

Admission to non-degree status does not constitute admission to a degree program. The student who seeks to enter a degree program will be directed to the appropriate department.

An international student on a non-immigrant visa may not enroll in the non-degree status.
GRADUATE CERTIFICATE OF CREDIT

ADMISSION

Admission to a graduate certificate of credit program requires that a person meet the minimum requirements of The Graduate School and any additional program requirements (see Admission Requirements). Refer to the appropriate field of instruction for specific requirements for admission to the certificate program.

Admission to a graduate certificate of credit program does not constitute admission to a degree program. To receive a graduate certificate of credit, students must be classified as degree-seeking students or as certificate-seeking students, but may not be classified as non-degree.

TRANSIENT ADMISSION

A student who is enrolled in good standing in a graduate degree program at another institution and who wishes to take courses for transfer to that institution may be admitted after submitting a completed Graduate Application for Admission, the $35 application fee, and a Transient Student Certification 10 days prior to registration. Only one semester, or a maximum of 12 hours, of coursework can be taken in transient status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

POST-DOCTORAL ADMISSION

Persons who hold an earned doctoral degree and desire to take graduate courses may be admitted in the post-doctoral status. A completed Graduate Application for Admission, the application fee, and confirmation of the doctorate are required for admission.

Admission in the post-doctoral status does not constitute admission to a degree program. The student who seeks to enter a degree program must meet all admission requirements of The Graduate School and be recommended by the program.

Admission of International Students

The Graduate School accepts only students who have superior records. An international student must have an equivalent 4-year Bachelor's degree with at least a B average on all previous coursework and a B+ on all previous graduate work. On various grading scales, this corresponds to:

- a. 14 on a 20-point scale.
- b. 80.0 from Taiwanese institutions.
- c. 1st Class or Division from Indian institutions.
- d. Upper 2nd Class from Korean institutions.
- e. Upper 2nd Class Honors on various British systems.

If graduating from a U.S. institution, the minimum is the same as that for domestic students (see Admission Requirements). Other grading systems are evaluated, upon receipt of transcripts, in accordance with standard recommendations. Many departments require a higher average than the minimum established by The Graduate School.

International students may apply for admission any semester, but normally enter the fall semester. The Graduate School deadlines for submission of applications are:

- Fall 15 March
- Spring 15 July
- Summer 15 November

The Office of Graduate Admissions and Records must be notified of any change in entering date after admission has been granted.

The following items must be received before admission will be considered:

1. A completed Graduate Application for Admission.
2. A $35 non-refundable processing fee. Payment should be made in United States dollars by a cashier's check, money order, or personal check. If payment is by personal check, it must be drawn on a United States bank to be honored in United States currency. Checks drawn on overseas banks are not accepted. International money orders are suggested.
3. Official or attested university records, with certified translations if the records are not in English (Notarized copies are not accepted).
4. Confirmation of degree(s). Confirmation must be received by the Office of Graduate Admissions and Records at least 2 months prior to the term of first enrollment.
5. Certification of English proficiency. Refer to section on English Certification.
6. Documentation of financial resources sufficient to support the student as stated on the financial statement form supplied to the applicant. This form is sent to the applicant after receipt of application.
7. Additional departmental/program requirements (refer to Majors and Degree Programs chart in front of Graduate Catalog).
   a. Reference letters or rating forms. All program forms should be sent to the college or department.
   b. Scores from the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT).

Admission must be granted, and financial documentation and degree confirmation must be received, prior to issuance of an I-20 or IAP-66 form needed to obtain a visa. The Graduate School will not issue these forms after the following dates:

- Fall 15 June
- Spring 1 November
- Summer 15 March

The University will not enroll any student who has not been approved initially, or for transfer, by the Immigration and Naturalization Services (INS) to attend UT.

An international student may not enroll as a non-degree student nor on probation.

English Certification

Any person whose native language is not English must submit results of the Test of English as a Foreign Language (TOEFL). A minimum score of 213 on the computer-based test or 550 on the paper test is required for admission consideration. Some departments require higher scores. The score must be no more than two years old from the requested date of entry. Applicants who have received a degree from an accredited U.S. institution within the past two years are exempt from the TOEFL requirement.

All students whose native language is not English must take an English proficiency examination after arrival at UT. Refer to section on English Proficiency.

Admission of Faculty and Staff Members

If admitted to The Graduate School, members of the faculty or staff located in Knoxville may take courses as graduate students.

Faculty members of UT or the Institute of Agriculture at the rank of assistant professor or above, and members of the administrative staff at UT, the UT Central Administration, and the Institute of Agriculture will not normally be admitted to an Ed.D. or Ph.D. degree program at UT. Exceptions may be granted on an individual basis upon petition to The Graduate School. Petitioners must present their request in writing, providing adequate assurance that the residence requirement will be met and that there will be no conflict of academic or administrative interest. Written endorsements must be provided by the respective deans and department heads of the units in which members are employed and in which the doctoral degrees are to be pursued. Requests should be directed to the Dean of The Graduate School.

Readmission

A student who has not attended The Graduate School at UT for three consecutive terms (including summer) must apply for readmission. A readmission application should be submitted to the Office of Graduate Admissions and Records at least two weeks prior to the desired reentry date. A student who has attended another institution since enrollment at UT must submit one official transcript showing all coursework and any degrees earned at that institution. The student will be notified when action has been taken by the department/program and The Graduate School. A student who is permitted to enroll and is subsequently denied readmission will receive credit for courses completed successfully. Future registration will not be allowed until readmission is granted.

Revision of Admission Classification

A student who wishes to change a major program of study must complete a Request for Change of Graduate Program form, which can be obtained from the Office of Graduate Admissions and Records. The form requires the signature of the head of the department in which admission was previously granted. No signature is needed if a student requests to change from non-degree status to a
Registration and Enrollment Requirements

Graduate Credit

To earn graduate credit, a student must be admitted by the Dean of The Graduate School and enrolled in an appropriate status as a graduate student. The registration must reflect the desire for graduate credit, and the course must have been approved by the Graduate Council. Coursework taken in any other status is unacceptable for graduate credit and cannot be retroactively changed to graduate credit. Special privileges are accorded UT seniors and professional students, as stated in the section on Undergraduates and Professional Students.

Courses numbered at the 500 level, as well as those 400-level courses approved for graduate credit, must be taught by faculty members who meet the criteria of an assistant professor or above as defined in the Faculty Handbook. They have been designated by the department head as being appropriate. Graduate teaching associates are ineligible to teach courses approved for graduate credit.

Consistent with the accreditation requirements of the Southern Association of Colleges and Schools (SACS) that graduate curricula must be substantially different from undergraduate curricula, classes at the 400-level in which both graduate and undergraduate students are enrolled must be structured so as to reflect this distinction. That is, course requirements for graduate credit will be more rigorous and thus will exceed expectations for undergraduates. Graduate and undergraduate completion of the same course will not be considered equivalent, and therefore petitions for retroactive changing of undergraduate to graduate credit will not be accepted.

Courses at the 600 level are taught by faculty who have been approved by the Dean of The Graduate School to do so. Criteria for eligibility to teach at the 600 level are available from The Graduate School.

Undergraduate and Professional Students

UT SENIORS

Subject to approval by The Graduate School, a senior at UT who needs fewer than 30 semester hours to complete requirements for a Bachelor’s degree and has at least a B average (3.0) may enroll in graduate courses for graduate credit, provided the combined total of undergraduate and graduate coursework does not exceed 15 credit hours per semester. Students who have met all requirements for graduation are not eligible for senior privilege. Approval must be obtained each semester at the Office of Graduate Admissions and Records during registration. A maximum of 9 hours of graduate credit at the 400 and 500 level can be obtained in this status. Some departments do not permit seniors to register for graduate courses without prior permission (see Majors and Degree Programs chart for information on restricted programs). Courses taken for graduate credit may not be used toward both the baccalaureate and graduate degree.

UT VETERINARY MEDICINE STUDENTS

A student in good standing in the College of Veterinary Medicine may enroll in UT graduate courses without being admitted to The Graduate School under the following conditions:

1. The student’s advisor must approve in advance the student’s enrollment in each course.
2. The student may take a maximum of 10 semester hours of graduate courses during the D.V.M. program.
3. Approval must be obtained each semester at registration through the Office of Graduate Admissions and Records. The student’s progress is subject to review and approval each semester by the Associate Dean, College of Veterinary Medicine.

Courses taken for graduate credit may not be used toward both the D.V.M. degree and a graduate degree.

UT LAW STUDENTS

Subject to approval by The Graduate School and the College of Law, a law student at UT may enroll in graduate courses for graduate credit. Approval must be obtained each semester at the Office of Graduate Admissions and Records during registration.

Courses taken for graduate credit may not be used toward both the J.D. degree and a graduate degree. Use of such courses toward the J.D. degree are subject to guidelines approved by the law faculty.

Law Courses

A graduate student may take up to 6 semester hours of law courses and apply them toward a graduate degree, upon approval of the College of Law and the student’s major professor. The graduate student must register for law courses during the registration period at the College of Law and request an S/NC grade. If the student earns a 2.0 or better, an S will be recorded on the transcript. Below 2.0, an NC will be recorded, and the course cannot be used toward meeting degree requirements.

Grades for law courses will not be reflected in the cumulative grade-point average, as law courses do not carry graduate credit.

Different rules apply to students enrolled in the Dual J.D.-MBA and J.D.-MPA programs. Grades must be earned according to the grading system of the respective colleges, e.g., numerical grades for law courses, letter grades for graduate courses. Refer to sections on Business Administration, Political Science, and Law under Fields of Instruction for grades acceptable to meet degree requirements.

A student enrolled in the Ph.D. in Business Administration program may use 8 semester hours or more of law courses for the supporting area via the arrangement described under Business Administration.

Graduate Certificate of Credit Programs

A graduate certificate of credit program is a series of academically coherent graduate credit courses offered by the university as a planned program that does not lead to a degree. A candidate for a graduate certificate of credit program must be a fully admitted graduate student who has satisfactorily completed (minimum 3.0 grade-point average) the minimum requirements for a certificate described in the Graduate Catalog under Fields of Instruction. A candidate must be a graduate student in good standing and comply with all other applicable policies of The Graduate School. Graduate certificate programs require a minimum of 12 semester credit hours taken at the UT. Use of credits to fulfill requirements for a graduate degree will be at the discretion of the academic department.

To receive the certificate, students must submit an application endorsed by the academic department to The Graduate School for approval. Only those certificate programs that are officially approved by the Graduate Council will be posted on student transcripts. Graduate students in non-degree classification are not eligible to receive a graduate certificate.

Senior or Disabled Citizens

Legislation gives Tennessee citizens who are 60 years of age or older, 30-year state retirees, or those who are totally disabled, the opportunity to attend credit and non-credit courses at the University at no charge on an audit, space available basis. Legal verification of any of these conditions is required for enrollment. Students who are 65 or over, or who are totally disabled, and who desire to receive UT credit for their courses, may pay a reduced charge of $7 per credit hour up to a maximum of $75 for a full-time...
Auditors and Audited Courses

Persons who wish to attend certain classes regularly, without taking examinations or receiving grades or credit, may do so by completing a graduate application as a non-degree student, paying the application fee, registering as an auditor, and paying regular fees. Graduate students paying regular fees also are entitled to audit courses.

The names of all auditors properly registered will appear on the intermediate class rolls, but will be removed from the final grade report. No record of audited coursework will appear on the permanent record. Persons may not attend class without being properly admitted to the University and registered in the class.

Courses in Non-Standard Format

The University offers a wide variety of short courses, workshops and other courses in non-standard format for graduate credit. Minimum criteria acceptable for such credit are as follows:

1. The number of contact hours should never be fewer than the equivalent of one hour per week during the term for each hour of credit awarded, i.e., 15 hours per semester.
2. For every contact hour, there should be at least two hours of student preparation.
3. For each hour of graduate credit under the semester system, there should be a minimum elapsed time of one week.

The workload in a short course of several weeks' duration need not be distributed evenly. However, substantive and meaningful interaction between the faculty member and student should be maintained throughout.

Graduate credit should not be awarded for courses considered inappropriate as part of a graduate degree program.

The Curriculum Committee of the Graduate Council monitors the policy. Each new course or change in a current course must be approved in both content and format.

Correspondence Study

No graduate credit is accepted at UT for work done by correspondence study at any university.

Proficiency Examinations

A proficiency examination may be given in academic courses offered for graduate credit. Applications for proficiency examinations are available in the Office of the Registrar, 209 Student Services Building. To be eligible, a student must be admitted to The Graduate School. The request for examination must be approved by the head of the department offering the course. A student applying for this privilege must present evidence to the department head that he/she has the knowledge and abilities expected of graduate students who have taken the same course. Upon passing the examination with a minimum grade of B, the student will receive graduate credit. A maximum of one-fourth of the total credit hours in a master's degree program may be earned by this method, subject to approval by the student's graduate committee. A fee of $7 per credit hour must be paid before each examination. Proficiency examinations may not be used to raise the grade or change the credit in a course previously completed, nor may such an examination be repeated. Proficiency examinations taken at other institutions are not transferable.

English Proficiency

Applicants whose native language is not English must pass an English proficiency examination given by the University prior to initial registration. Students whose performance on the examination indicates a need for additional English study must enroll immediately for English 121 English Grammar Review for Non-Native Speakers (or another course assigned by the English Department) for undergraduate credit and pass with a grade of C or better. A student may not take more than 6 additional hours of course work while enrolled in English 121.

Students whose scores indicate that they are not prepared to enter English 121 will be referred to a program of intensive English study prior to enrolling in an academic program. Applicants whose native language is not English must pass an oral test in English (the SPEAK Test) before they can be assigned to classroom duties in connection with their assistantships. The SPEAK Test is administered on campus by The Graduate School. Scores from the Test of Spoken English (TSE) may be accepted in place of the SPEAK Test.

Prerequisites

Graduate work in any program must be preceded by sufficient undergraduate work in the major and related areas to satisfy the department that the student can do graduate work successfully in the chosen field. Individual undergraduate records are examined and evaluated by the appropriate department before admission to a degree program is granted. Questions about program prerequisites should be addressed to the advisor.

Advisor/Major Professor

Every graduate student must have an advisor from the major department. This professor advises the student about courses, supervises the student's research, and facilitates communication within the major department, to other departments and to The Graduate School. The advisor must approve the student's program each semester. Many departments assign a temporary advisor to direct the entering student's work during the period in which the student is becoming acquainted with the institution and determining the focus of research interests, and in which the department is forming a judgment concerning the student's promise as a scholar. As early as appropriate, the student requests a professor in the major department to serve as the advisor. This major professor and the student together select a graduate committee. The student is expected to maintain close consultation with the major professor and other members of the graduate committee with regard to progress in the program. Other responsibilities of the advisor/major professor are explained under individual programs.

Departmental Liaison

To assist graduate students in other majors, one faculty member in each academic department has been designated as a liaison. The liaison is identified in the list of faculty under each department. The liaison acts as a departmental contact to assist non-departmental students with course selection and other academic matters.

Registration

Registration is required of all graduate students when using University facilities and/or faculty time. The minimum number of hours for registration is three. Registration allows use of services such as library checkout, laboratories, and recreation facilities not open to the public.

Information concerning registration is available in the Graduate School News and Timetable of Classes each term. Registration is accomplished via telephone. During priority registration, a schedule and bill is mailed to the registrant. Payment is due by the deadline noted on the bill. A graduated late fee is assessed to any student who fails to register during priority registration.

Additional information can be obtained from the Computer Assisted Registration Services Office, (865) 974-2223.

Failure to pay tuition and fees before the deadline, as noted each semester on the schedule, will result in cancellation of the schedule. Retroactive registration is not allowed.

Non-degree students in unrestricted programs (see Majors and Degree Programs Chart) may obtain permission to register from the Office of Graduate Admissions and Records. Non-degree students with no
declared major must obtain permission from the department/program head to register for courses in restricted fields.

Conditional Registration

Applicants who appear to meet the admission requirements of The Graduate School may be allowed to register for an initial term after submitting the Graduate Application for Admission form and application fee. Time is allowed to obtain transcripts and additional requirements for admission. Students who fail to gain admission within seven weeks after registration will NOT be permitted to register again until all admission requirements are met.

International students may not register conditionally.

Registration for Use of Facilities

Students using University facilities, services or faculty time, including summer term, must be registered. Normally, students are registered for coursework or thesis/dissertation credit. Non-thesis students or those who have not begun research, but who have completed all coursework requirements, must register for course 502.

Course Description

Each course listed in the Graduate Catalog contains information in abbreviated form. The course number indicates the level at which the course is taught. All 500- and 600-level courses are graduate courses. The 400-level courses are upper division courses available for graduate credit only if listed in the Graduate Catalog. To receive graduate credit for these, a student must so request at registration.

The official course title appears following the number. Numbers in parentheses following the course title indicate the semester hours credit. If the credit is variable, to be determined in consultation with the instructor, the minimum and maximum are shown (e.g. 2-3). The credit hours are followed by a course description indicating the content to be covered.

Prerequisite courses must be taken prior to the course in question. Corequisite courses may be taken prior to or concurrently with the specific course. Both prerequisites and corequisites are checked during registration. Recommended pre-requisites should be taken previously but are not mandatory. Required background is the knowledge base needed before taking the course.

Some courses may be repeated for a maximum number of hours allowable toward a degree program. This number is stated for each repeatable course with the exception of Thesis 500, Dissertation 600, and Registration for Use of Facilities 502. Courses may be cross-listed with two or more departments, an arrangement indicated by a parenthetical statement: (Same as Psychology 543). The course description is given only under the primary department. "S/NC only" indicates that the course may be taken only for Satisfactory/No Credit grading. Refer to section on Grades. A symbol indicating the semester or frequency that the course is normally offered is included at the end of many course descriptions:

- F-Fall
- E-Every semester
- Sp-Spring
- A-Alternate years
- Su-Summer

These codes are indicated only for Knoxville campus classes and are subject to change without notice. The Timetable of Classes, published prior to registration for each semester, is the official notification of courses offered for a given semester. Students should contact the appropriate department/program head concerning courses to be offered in future semesters.

Change of Registration

The permanent record will show all courses for which the student has registered except those audited and those from which the student has withdrawn during the first 29 calendar days after the beginning of classes.

Students who fail to attend the first class meeting without prior arrangement with the department MAY BE DROPPED from the course to make space available to other students. Students have the responsibility to assure that they have been dropped. Otherwise they may receive a grade of F in the course.

Course registration may be changed from credit to audit or audit to credit only during the first 29 calendar days after the beginning of classes.

The deadline for all other changes of registration (e.g. from graduate to undergraduate, undergraduate to graduate, withdrawal) is approximately 42 calendar days after the first day of classes each semester. (See Graduate School News or Timetable of Classes each term for exact date.) A student may change registration for a course at any time prior to and including this date by accessing the telephone registration system. The student must affirm that the advisor has granted approval of the change. If additional permission is necessary, a student must execute a change of registration, in person, at the Registration Services Office. The instructor's signature is required to add a course, if the course is closed and/or after the first 29 calendar days of classes. The student must sign the form certifying approval of the advisor.

To change registration in any way after the deadline, a student must present the request, together with documentary evidence of extenuating circumstances, to the Office of Graduate Admissions and Records. In addition, the student must complete a change of registration form and questionnaire signed by the instructor(s) and advisor as evidence of their knowledge of the request. If the request is approved, the Office of Graduate Admissions and Records will authorize the change on the student's permanent record.

Course Loads

The maximum load for a graduate student is 15 hours, and 9 to 12 hours are considered a full load. For the summer term, graduate students may register for a maximum of 12 semester hours in an entire summer term or for a maximum of 6 semester hours in a 5-week summer session. Students may enroll in only one course during a mini-term session.

Students holding a one-half time assistantship normally should enroll for 6-9 semester hours. A one-fourth time graduate assistant normally should take 9-13 semester hours. A student on a one-half time assistantship who takes six semester hours will be considered full time. Refer to the Policy for the Administration of Graduate Assistantships for additional information.

Students receiving financial aid should consult with the department/program head concerning appropriate course loads. Courses audited do not count toward minimum graduate hours required for financial assistance.

Registration for more than 15 hours during any semester, or for more than 12 hours in the summer term, is not permissible without prior approval of The Graduate School, which may allow registration of up to 18 hours during the summer term if the student has achieved a cumulative grade-point average of 3.6 or better in at least nine hours of graduate work with no outstanding incompletes. No more than 12 hours are permissible in the summer term without prior approval.

Grade-Point Average and Grades

A cumulative grade-point average of 3.0 is required on all graduate coursework taken at UT to remain in good standing and to receive any graduate degree or certificate from the University. All coursework taken for graduate credit is computed into the GPA.

Grades in The Graduate School have the following meanings:

- A (4 quality points per semester hour), superior performance.
- B+ (3.5 quality points per semester hour), better than satisfactory performance.
- B (3 quality points per semester hour), satisfactory performance.
- C+ (2.5 quality points per semester hour), less than satisfactory performance.


**Academic Standards**

Graduate education requires continuous evaluation of the student. This includes not only periodic objective evaluation, such as the cumulative grade-point average, performance on comprehensive examinations and acceptance of the thesis or dissertation, but also judgments by the faculty of the student's progress and potential. Continuation in a program is determined by consideration of all these elements by the faculty and the head of the academic unit.

The academic records of all graduate students are reviewed at the end of each semester, including the summer term. Graduate students must maintain a cumulative grade-point average (GPA) of at least 3.0 on all graduate courses taken for a letter grade of A, B, or C. No student may graduate without an I given to enable a student to do additional work to raise a deficient grade. All incompletes must be removed within one semester, excluding the summer term. If a supplementary grade report has not been received in the Office of Graduate Admissions and Records at the end of the semester, the I will be changed to an F. The course will not be counted in the cumulative grade-point average until a final grade is assigned. No student may graduate with an I on the record.

S/NC (carries credit hours, but no quality points), S is equivalent to a grade of B or better, and NC means no credit earned. Courses in which NC is received may be repeated for a grade of S. A grade of S/NC is assigned only where indicated in the course description in the Graduate Catalog. The number of S/NC courses in a student's program is limited to one-fourth of the total credit hours required.

PNP (carries credit hours, but no quality points), P indicates progress toward completion of a thesis or dissertation. NP indicates no progress or inadequate progress.

W (carries no credit hours or quality points), indicates that the student officially withdrew from the course.

The grading system available for a course is based on the level of the course. Courses numbered 100-499 are graded letter grade or S/NC, except where noted otherwise in the catalog. Courses numbered 500-699 are graded letter grade only, except where the graduate catalog indicates S/NC only or optional S/NC or letter grade. Veterinary Medicine courses are letter grade only except where noted S/NC only. Law courses are numeric, except where noted otherwise. There are restrictions regarding the use of S/NC graded courses, including the number of hours that may be used toward any degree program.

No graduate student may repeat a course for the purpose of raising a grade already received, with the exception of NC. A graduate student may not do additional work nor repeat an examination to raise a final grade. A change of grade may occur only in cases of arithmetic or clerical error and must have approval of The Graduate School. An instructor may not initiate a change of grade as a result of a reevaluation of the quality of the student's performance nor as a result of additional work performed by the student.

Refer to Law Courses under Registration and Enrollment Requirements and Law under Fields of Instruction for Law grading system.

**Academic Honesty**

Academic integrity is a responsibility of all members of the academic community. An honor statement is included on the application for admission and readmission. The applicant's signature acknowledges that adherence is confirmed. The honor statement declares:

An essential feature of The University of Tennessee is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.

**PLAGIARISM**

Students shall not plagiarize. Plagiarism is the use of an intellectual property or product of someone else without giving proper credit. The undocumented use of someone else's words or ideas in any medium of communication (unless such information is recognized as common knowledge) is a serious offense, subject to disciplinary action that may include failure in a course and/or dismissal from the University. Some examples of plagiarism are:

- Using without proper documentation (quotation marks and a citation) written or spoken words, phrases, or sentences from any source.
- Summarizing without proper documentation (usually a citation) ideas from another source (unless such information is recognized as common knowledge).
- Borrowing facts, statistics, graphs, pictorial representations, or phrases without acknowledging the source (unless such information is recognized as common knowledge).

Submitting work, either in whole or in part, created by a professional service and used without attribution (e.g., paper, speech, bibliography, or photography). Extreme caution should be exercised by students involved in collaborative research to avoid questions of plagiarism. If in doubt, students should check with the major professor and the Dean of The Graduate School about the project. Plagiarism will be investigated when suspected and prosecuted if established.

**Appeals Procedure**

The Graduate Council Appeal Procedure can be obtained at the Office of Graduate Admissions and Records. Normally, grievances should be handled at the departmental level through the student's academic advisor or the department or program head. Further appeal may be made to the dean of the respective college, the Dean of The Graduate School, the Graduate Council, and ultimately to the Chancellor.

The Graduate Council hears appeals concerning the interpretation of and adherence to university, college and department policies and procedures as they apply to graduate education. The Council does not review grievances concerning
grades, which are reviewed at the department or college level. Grades are appealed first to the faculty member and then, if necessary, to the department head and dean of the college.

Apaisal procedures in regard to allegations of misconduct or academic dishonesty are presented in Hilltops under "Student Rights and Responsibilities." Students with grievances related to race, sex, color, religion, national origin, age, disability or veteran status in English at the master's and doctoral levels, and in Environmental Policy (Economics) at the master's level only. See Fields of Instruction for specific requirements and approval provisions.

The minor area must be approved by the major and minor academic units, and a member from the major unit must serve on the graduate committee.

**Minors**

For the master's degree at UT, a minor is defined as 6-12 semester hours in one field outside the major. Usually the minor courses are within a single teaching discipline that also offers a major.

Three interdisciplinary minors are available: in Statistics (Business Administration) and in Gerontology (Human Ecology) at both the master's and doctoral levels, and in Environmental Policy (Economics) at the master's level only. See Fields of Instruction for specific requirements and approval provisions.

The minor area must be approved by the major and minor academic units, and a member from the major unit must serve on the graduate committee.

**Transfer Credits**

Courses taken at another institution may be considered for transfer into a master's or Ed.S. program as determined by the committee and approved by The Graduate School. At the doctoral level, courses are not officially transferred although they may be used to meet degree requirements. Where a requirement has been met through coursework in another program, the student may petition the academic unit for a waiver of the requirement at the doctoral level. Official transcripts must be sent directly to the Office of Graduate Admissions and Records from all institutions previously attended before any credit will be considered.

To be transferred into a master's or Ed.S. program at UT, a course must:
1. be taken for graduate credit.
2. carry a grade of B or better.
3. be a part of a graduate program in which the student had a B average.
4. not have been used for a previous degree.
5. be approved by the student's graduate committee and The Graduate School on the Admission to Candidacy form.

Courses transferred to any graduate program will not affect the minimum residence requirements for the program, nor will they be counted in determining the student's grade-point average. Credits transferred from universities outside the University of Tennessee system cannot be used to meet the thesis or dissertation requirements or 600-level coursework requirements. Credit for extension courses taken from other institutions is not transferable, nor is credit for any course taken at an unaccredited and/or foreign institution.

**MASTER'S DEGREE**

A minimum of one-half of the total hours required for a master's degree must be taken at UT. A maximum of one-third of the total hours may be transferred from institutions outside the University of Tennessee system, upon request by the academic unit. In addition, the student may transfer courses taken at other campuses of The University of Tennessee. Transferred courses must have been completed within the six-year period prior to receipt of the degree. The courses must be listed on the Admission to Candidacy form and will be placed on the student's UT transcript only after admission to candidacy.

**EDS. DEGREE**

A maximum of six semester (nine quarter) hours of coursework beyond the master's degree may be transferred to an Ed.S. program. Transferred courses in the most recent 30 hours taken for the degree must have been completed within the six-year period prior to the receipt of the degree. The courses must be listed on the Admission to Candidacy form and will be placed on the student's UT transcript only after admission to candidacy.

**DOCTORAL DEGREE**

Coursework taken prior to admission to a doctoral program may be used toward the degree, as determined by the student's doctoral committee. Although the courses are used as part of the requirements toward the degree and are listed on the admission to candidacy, they are not officially transfer courses and are not placed on the student's UT transcript.

**Theses and Dissertations**

All theses and dissertations are submitted to The Graduate School Thesis/Dissertation Consultant for examination. The Consultant will review the material and assure that it is attractively presented, free of technical errors in format, suitable for binding, and reflects credit upon the University and The Graduate School. If the thesis or dissertation is not accepted, the student must make corrections and resubmit the material. The student, major professor and committee share responsibility for the accuracy and professionalism of the final product of the student's research. The student should confer with the Thesis/Dissertation Consultant regarding problems and questions in advance of preparing the final copy. The UT Knoxville Guide to the Preparation of Theses and Dissertations (8th ed) provides the correct format for theses or dissertations. Workshops are held periodically throughout the academic year. The date for each workshop is announced in the Graduate School News.

The thesis/dissertation normally should be written in English. Under exceptional circumstances, another language may be used if prior approval is obtained from The Graduate School. A request to write in a language other than English should be submitted to the Dean of The Graduate School by the student's thesis committee, with endorsement by the Department Head and Dean of the College, prior to Admission to Candidacy for the degree sought. The request should include a proposal and justification for the exception. In all cases, one thesis/dissertation abstract must be written in English.

A basic principle in graduate education is that theses and dissertations produced by graduate students will be published and made available to other researchers in the field. When a graduate student is involved in classified or proprietary research, and such
research is intended to lead toward a thesis or dissertation, prior approval should be secured from the Department Head and Dean, and from the Dean of The Graduate School. Should the research become classified as a project, these same procedures should be followed immediately so that proper procedures can be assured. Failure to comply with these requirements may lead to rejection of a thesis or dissertation manuscript.

Master’s Degrees

The master’s degree is evidence of successful completion of a body of coursework, advanced understanding, and the ability to apply knowledge within a major field. As part of a master’s degree, and in addition to a final comprehensive examination, a culminating (capstone) experience is expected. Examples of culminating experiences include an advanced seminar, exhibit, independent project, integrated case study, or simulation, internship, practicum, recital or thesis. Through this experience, the student will demonstrate skills associated with the particular degree program, such as applied performance, critical analysis, organization and writing.

Master’s degree programs are available with thesis and non-thesis options. These programs require 30 or more graduate hours of coursework. In addition to the M.A. and M.S. degrees, other degrees are offered, including the MBA and the M.S.W.

Course Requirements

A candidate for a master’s degree must complete a minimum of 30 hours of graduate credit in courses approved by the student’s master’s committee. In thesis programs, 6 semester hours of credit in the major (9-12 in some approved programs) must be earned in course 500 while the student is preparing the thesis. Hours applied to the master’s degree may be entirely from one major subject or may be distributed to include one or two minor areas. In a 30-hour program, the major subject must include at least 12 hours of graduate coursework, exclusive of course 500, and a minor must include not fewer than 6, nor more than 12, hours of graduate credit. At least two-thirds of the minimum required hours in a master’s degree program must be taken in courses numbered at or above the 500 level. Only 6 semester hours may be counted toward this requirement.

For coursework taken at other institutions, refer to section on Transfer Credits.

Second Master’s Degrees

For a second master’s degree, the student must have fulfilled all major requirements applicable to the first master’s degree, including the thesis, if appropriate. Coursework applied to one master’s degree program may not be applied toward a second.

Master’s Committee

A committee composed of the major professor and at least two other faculty members, all at the rank of assistant professor or above, should be formed as early as possible in a student’s program, and must be formed by the time a student applies for admission to candidacy (refer to Advisor/Major Professor). The responsibility of this committee is to assist the student in planning a program of study and carrying out research, and to assure fulfillment of the degree requirements. If the student has a minor, one member of the committee must be from the minor department.

Admission to Candidacy

Admission to candidacy reflects agreement among the student, graduate committee, and The Graduate School that the student has demonstrated ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. This action usually connotes that all prerequisites to admission have been completed and a program of study has been approved.

The application for the master’s degree is made as soon as possible after the student has completed any prerequisite courses and nine hours of graduate coursework with a 3.0 average or higher in all graduate work. The Admission to Candidacy form must be signed by the student’s committee and list all courses to be used for the degree, including transfer coursework. The student must submit this form to the Office of Graduate Admissions and Records no later than commencement day of the semester preceding the semester in which he/she plans to graduate.

Thesis Registration

A student must be registered for course 500 each semester during work on the thesis, including a minimum of 3 hours for the semester in which the thesis is accepted by The Graduate School. Six hours of 500 are required for the thesis option. After receiving the master’s degree, a student is no longer permitted to register for Thesis 500.

Thesis

The thesis represents the culmination of an original research project completed by the student. It must be prepared according to the UT Knoxville Guide to the Preparation of Theses and Dissertations (8th ed.). Two copies of the thesis must be approved and accepted by The Graduate School on or before the deadline specified each semester in the Graduate School News. Each copy must include an approval sheet, signed by the members of the committee, certifying that they have examined the final copy of the thesis and have judged it to be satisfactory.

Final Examination for Thesis and Problems in Lieu of Thesis

A candidate presenting a thesis or problems in lieu of thesis must pass a final comprehensive oral (or oral and written) examination on all work offered for the degree. The examination, which is concerned with coursework and the thesis or problems, measures the candidate’s ability to integrate material in the major and related fields, including the work presented in the thesis or problems. The final draft of the thesis must be distributed to all committee members at least two weeks prior to the date of the final examination. Except with prior approval from The Graduate School, the final examination must be given in University-approved facilities. This examination must be scheduled through the Office of Graduate Admissions and Records at least one week prior to the examination. Final examinations not properly scheduled must be repeated. This examination must be held at least two weeks before the final date for acceptance and approval of thesis by The Graduate School. The major professor must submit the results of the defense by the thesis deadline. In case of failure, the candidate may not apply for reexamination until the following semester. The result of the second examination is final.

Final Examination for Non-Thesis Students

Each non-thesis student must pass a final comprehensive written examination. A candidate may require an additional oral examination. The examination is not merely a test over coursework, but a measure of the student’s ability to integrate material in the major and related fields. Except with prior approval from The Graduate School, the examination must be given in University-approved facilities. It must be scheduled through the Office of Graduate Admissions and Records in accordance with the deadlines specified in the Graduate School News and will be conducted by the master’s committee. Final examinations not properly scheduled must be repeated. Students taking the final examination but not otherwise using University facilities may pay a fee equal to one hour of graduate credit instead of registering. In case of failure, the candidate may not apply for reexamination until the following semester. The result of the second examination is final.

Time Limit

Candidates have six calendar years to complete the degree, starting at the beginning of the semester of the first course counted toward the degree. Students who change degree programs during this six-year period may be granted an extension after review and approval by The Graduate School. In any event, courses used toward a master’s degree must have been taken within six calendar years of graduation.

Specialist in Education Degree

The Specialist in Education (Ed.S.) degree is offered with a major in Education. Admission to the Ed.S. program requires acceptance by The Graduate School, and review and acceptance by the department or area in which the student is majoring. It is recommended that students who apply for the Ed.S. degree have at least one year of related work experience. Additional information on admission requirements can be obtained from academic units offering the degree.
COURSE REQUIREMENTS

The student's program involves a minimum of four semesters of study totaling not fewer than 60 semester hours of graduate credit beyond the baccalaureate degree. A minimum of 6 hours is required outside the major academic unit or area.

A student admitted to the program with a master's degree, or with acceptable work beyond the master's degree, may have program requirements modified upon recommendation of the student's committee. However, no modifications will be permitted in examination and research requirements, nor in the minimum 6 graduate hours required outside the major. All prior coursework accepted toward the degree must be related to the student's program objectives. A maximum of 6 hours beyond the master's degree may be transferred from another institution to an Ed.S. program (refer to section on Transfer Credits).

Courses numbered at the 400 level required for certification through UT may not be taken for graduate credit and used as coursework in the major. At least one-half of the last 30 semester hours of work, exclusive of thesis courses, must be in 500- or 600-level courses.

ED.S COMMITTEE

A committee of at least three faculty members is assigned to each student. A minimum of two members of this committee must represent the unit or major area. Its responsibilities include formulating the student's program of coursework, supervising progress, recommending admission to candidacy, directing research, and coordinating the qualifying and final examinations.

RESIDENCE REQUIREMENTS

Residence is defined as full-time registration for a given semester on the campus where the program is located. The summer term is included in this period. During residence, it is expected that the student will be engaged in full-time on campus study toward a graduate degree.

For the Ed.S. degree, one semester of residence is required if the student has a master's degree; two consecutive semesters of residence if the student lacks a master's degree.

ADMISSION TO CANDIDACY

Admission to candidacy reflects agreement among the student, graduate committee, and The Graduate School that the student has demonstrated ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. This action usually connotes that all prerequisites to admission have been completed and a program of study must be approved. The Admission to Candidacy form must be signed by the student's committee and list all courses to be used for the degree, including transfer coursework. This form is submitted to the Office of Graduate Admissions and Records before the student has completed 15 hours of coursework in the Ed.S. program. A qualifying examination may be required for admission to candidacy if the student has a master's degree earned six years or more prior to admission to the program. This examination may be written and/or oral.

RESEARCH REQUIREMENTS

See the program descriptions of individual departments for list of thesis, problems in lieu of thesis, and non-thesis options. Some departments offer only a thesis program.

1. In the non-thesis program, a candidate will study research methods and findings and will demonstrate skill in adapting them to professional needs as defined by the major department.

2. In the thesis program, or problems in lieu of thesis, 6 hours of research credit (518 or 503) must be taken in preparation of an acceptable piece of work. The student must continue to register for thesis or problems while working on the project, including the semester it is accepted by The Graduate School. The thesis must be prepared according to instructions in the UT Knoxville Guide to the Preparation of Theses and Dissertations (6th ed.), and approved by the student's committee prior to submission to The Graduate School for final approval and acceptance.

FINAL EXAMINATION

A candidate presenting a thesis, or problems in lieu of thesis, must pass an oral examination covering the student's research and program of study. A non-thesis student must pass a final written, oral and written oral examination, on all work offered for the degree. The examination is not merely a test over coursework, but a demonstration of the candidate's ability to integrate materials in the major and related fields. Each examination must be scheduled through the Office of Graduate Admissions and Records before the deadline and will be conducted in University-approved facilities by the student's committee. Final examinations not properly scheduled must be repeated. In case of failure, the candidate may not be reexamined until the following semester. The result of the second examination is final.

TIME LIMIT

Candidates have six calendar years from the time of entry into the last 30 hours of their degree programs to complete the Ed.S. degree.

Doctoral Degrees

Two doctoral degree programs are available: Doctor of Philosophy (Ph.D.) and Doctor of Education (Ed.D.). For a list of programs, see Majors and Degree Programs chart. For specific degree requirements, consult individual program descriptions listed by college and field of instruction in this Catalog. See also Summary of Procedures for Doctoral Degrees chart.

The doctoral degree is evidence of exceptional scholarly attainment and demonstrated capacity in original investigation. Requirements for the degree, therefore, include courses, examinations, and a period of resident study, as well as arrangements which guarantee sustained, systematic study and superior competency in a particular field.

PROGRAM OF STUDY

The student's program of study is subject to Graduate Council policies and individual program requirements. The program of study as listed by the student on the Admission to Candidacy form must be approved by the doctoral committee. Doctoral programs include a major field or area of concentration and, frequently, one or more cognate fields. Cognate fields are defined as a minimum of 6 semester hours of graduate coursework in a given area outside the student's major field.

A candidate for a doctoral degree must complete a minimum of 24 hours of graduate coursework beyond the master's degree, which is a prerequisite for entry into most doctoral programs. If the doctoral program does not require a master's degree, the candidate must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. A minimum of 6 semester hours of the student's coursework must be taken in UT courses at the 600 level, exclusive of dissertation.

In addition, 24 hours of course 600 Doctoral Research and Dissertation are required (see Continuous Registration). For coursework taken prior to admission to the doctoral program, refer to section on Transfer Credits.

DOCTORAL COMMITTEE

The major professor directs the student's dissertation research and chairs the dissertation committee. The student and the major professor identify a doctoral committee composed of at least four faculty members, holding the rank of Assistant Professor or above, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from an academic unit other than that of the student's major field. This committee is nominated by the department head or college dean and approved by The Graduate School.

The committee should be formed during the student's first year of doctoral study. Subject to Graduate Council policies and individual program requirements, the committee must approve all coursework applied toward the degree, certify the student's mastery of the major field and any cognate fields, assist the student in conducting research, and recommend the dissertation for approval and acceptance by The Graduate School.

DOCTORAL EXAMINATIONS

Departments may, at their option, administer diagnostic and/or qualifying examinations in the early stages of the student's doctoral program. Successful completion of a comprehensive examination and a defense of dissertation is required for all doctoral degrees. Registration is required the term in which examinations are taken.
Diagnostic Examination
A student on admission to a doctoral program may be given a written and/or oral diagnostic examination to help determine the student's level of preparation, areas of strengths and weaknesses, and general background. The diagnostic examination is designed to aid in the selection of courses and to determine the student's preparation to continue doctoral studies at UT.

Qualifying Examination
A written and/or oral qualifying examination may be given near the end of the student's first year in the doctoral program. Qualifying examinations are designed to test the student's progress, general knowledge of fundamentals of the field, and fitness to continue with the more specialized aspects of the doctoral program.

Comprehensive Examination
The comprehensive examination (or the final part of this examination, when parts are given at different times) is normally taken when the doctoral student has completed all or nearly all prescribed courses. Thus, its successful completion indicates that, in the judgement of the faculty, the doctoral student can think analytically and creatively, has a comprehensive knowledge of the field and the specialty, knows how to use academic resources, and is deemed capable of completing the dissertation. The comprehensive examination must be passed prior to admission to candidacy. A written examination is required, and an oral examination is encouraged.

The faculty of the graduate program and/or the student's doctoral committee will determine the content, nature and timing of the comprehensive examination and certify its successful completion. The department or committee may at its discretion subdivide the examination, administering portions of the examination at several times during the student's course of study. Students should review carefully the written statement from each doctoral degree program which details the timing, areas covered, grading procedures, and provisions for repeating a failed examination.

Defense of Dissertation Examination
A doctoral candidate must pass an oral examination on the dissertation. The dissertation, in the form approved by the major professor, must be distributed to the committee at least two weeks before the examination. The examination must be scheduled through the Office of Graduate Admissions and Records at least one week prior to the examination and must be conducted in University-approved facilities. Final examinations not properly scheduled must be repeated. The examination is announced publicly and is open to all faculty members. The defense of dissertation will be administered by ALL members of the doctoral committee after completion of the dissertation and all course requirements. This examination must be passed at least two weeks before the date of submission and acceptance of the dissertation by The Graduate School. The major professor must submit the results of the defense by the dissertation deadline.

LANGUAGE REQUIREMENTS
Candidates for the Ph.D. degree may be required to demonstrate a reading knowledge of at least one foreign language in which there exists a significant body of literature relevant to the major field of study. Please refer to the descriptions of individual programs. The doctoral committee will determine the specific language (or languages) required. When the student is prepared to take a language examination, he/she should complete an Application for Doctoral Language Examination at the Office of Graduate Admissions and Records in accordance with the dates and times for the examinations printed in the Graduate School News.

Satisfactory completion (grade of B or better) of German 332 or French 302 may be substituted for a language examination. Some programs may accept a computer language in lieu of a foreign language.

RESIDENCE REQUIREMENTS
Residence is defined as full-time registration for a given semester on the campus where a significant body of literature exists in the student's field of study. The summer term is included in this period. During residence, it is expected that the student will be engaged in full-time on-campus study toward a graduate degree.

For the doctoral degree, a minimum of two consecutive semesters of residence is required. Individual doctoral programs may have additional residence requirements.

A statement as to how and during what period of time the residence requirement has been met will be presented with the Application for Admission to Candidacy along with signatures of approval from the major professor and the Department Head/Program Director. More information about the rationale for the residence requirement may be obtained from the Graduate Council report available from The Graduate School.

ADMISSION TO CANDIDACY
Admission to candidacy reflects agreement among the student, graduate committee, and The Graduate School that the student has demonstrated the ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. This action usually connotes that all prerequisites to admission have been completed and a program of study has been approved.

A student may be admitted to candidacy for the doctoral degree after passing the comprehensive examination, fulfilling any language requirements (for Ph.D.), and maintaining at least a B average in all graduate coursework. Each student is responsible for filing the admission to candidacy form, which lists all courses to be used for the degree, including courses taken at UT or at another institution prior to admission to the doctoral program, and is signed by the doctoral committee. Admission to candidacy must be applied for and approved by The Graduate School at least one full semester prior to the date the degree is to be conferred.

CONTINUOUS REGISTRATION
The student must register continuously for course 600 (minimum of 3 hours) from the time the doctoral research proposal is approved, admission to candidacy is accepted, or registration for course 600 is begun, whichever comes first, including summer terms and the semester in which the dissertation is approved by The Graduate School. A minimum total of 24 hours of course 600 is required before the dissertation will be accepted.

A student who will not be using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of six terms (including summer terms). The request, to be made in advance, will be considered by The Graduate School upon written recommendation of the department head.

DISSERTATION
The dissertation represents the culmination of an original major research project completed by the student. The organization, method of presentation, and subject matter of the dissertation are important in conveying to others the results of such research.

A student should be registered for the number of dissertation hours representing the fraction of effort devoted to this phase of the candidate's program. Thus, a student working full time on the dissertation should register for 12 hours of course 600 per semester.

Two copies of the dissertation (prepared according to the regulations in the UT Knoxville Guide to the Preparation of Theses and Dissertations, 8th ed.) must be submitted to and accepted by The Graduate School. Each copy must include an approval sheet, signed by all members of the doctoral committee, which certifies to The Graduate School that they have examined the final copy and found that its form and content demonstrate scholarly excellence. Microfilm Agreement form, Survey of Earned Doctorates, and Abstract form are also submitted at this time. The student should check with the department head concerning additional required copies of the dissertation.

TIME LIMIT
Comprehensive examinations must be taken within five years, and all requirements must be completed within eight years, from the time of a student's first enrollment in a doctoral degree program.
## Summary of Procedures for Master's Degrees and Specialist in Education Degree

### PROCEDURES

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<tr>
<td>Submission of application for admission to candidacy</td>
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<td>Approval of admission to candidacy</td>
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### Graduation Requirements for Non-Thesis Option

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<td>Scheduling of Final Examination</td>
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<td>Final Examination</td>
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<tr>
<td>Removal of Incomplete(s)</td>
<td>Not later than one week prior to Commencement*</td>
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### Graduation Requirements for Thesis/Problems Options

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<td>At beginning of term of graduation*</td>
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<tr>
<td>Submission of thesis/problems to master's/Ed.S. committee</td>
<td>At least two weeks prior to Final Examination</td>
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<td>Scheduling of Final Examination</td>
<td>Not later than one week prior to Final Examination*</td>
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<td>Final Examination</td>
<td>Not later than four weeks prior to Commencement*</td>
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<tr>
<td>Approval and acceptance of final copy of thesis</td>
<td>After Final Examination and not later than two weeks prior to Commencement*</td>
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<tr>
<td>Removal of Incomplete(s)</td>
<td>Not later than one week prior to Commencement*</td>
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</tbody>
</table>

*Deadline dates are printed in the Graduate School News each semester, in addition to a separate publication of Deadline Dates for Graduation. Both are available on the Graduate School Web Page (http://web.utk.edu/~gsinfo).
### Summary of Procedures for Doctoral Degrees

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission as a potential degree candidate</td>
<td>Office of Graduate Admissions and Records and Major Department</td>
<td>Prior to completing 15 hours of graduate courses</td>
</tr>
<tr>
<td><em>Appointment of doctoral committee</em></td>
<td>The Graduate School on recommendation of department head</td>
<td>Preferably during the first year of graduate study, but at the latest, prior to application for admission to candidacy</td>
</tr>
<tr>
<td><em>Comprehensive Examination</em></td>
<td>Major department</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td><em>Language examination(s)</em></td>
<td>Office of Graduate Admissions and Records</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td>Submission and approval of application for admission to candidacy</td>
<td>Doctoral Committee and The Graduate School</td>
<td>At least one semester prior to graduation***</td>
</tr>
</tbody>
</table>

### Graduation Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Under Direction Of</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>At beginning of term of graduation***</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>At beginning of term of graduation***</td>
</tr>
<tr>
<td>Submission of dissertation to doctoral committee</td>
<td>Student</td>
<td>At least two weeks prior to Defense of Dissertation Examination</td>
</tr>
<tr>
<td>Scheduling of Defense of Dissertation Examination</td>
<td>Student, Committee and Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to Defense of Dissertation Examination***</td>
</tr>
<tr>
<td>Defense of Dissertation Examination</td>
<td>Doctoral Committee</td>
<td>Not later than four weeks prior to Commencement***</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of dissertation and doctoral forms</td>
<td>Doctoral Committee and The Graduate School</td>
<td>After Defense of Dissertation Examination and not later than two weeks prior to Commencement***</td>
</tr>
<tr>
<td>Removal of Incomplete(s)</td>
<td>Instructor of Course</td>
<td>Not later than one week prior to Commencement***</td>
</tr>
</tbody>
</table>

*The order of these items varies with individual programs.

**Not required in some programs.

***Deadline dates are printed in the Graduate School News each semester, in addition to a separate publication of Deadline Dates for Graduation. Both are available on the Graduate School Web Page (http://web.utk.edu/~gsinfo).
Residency Classification for Tuition Purposes

A prospective student who applies to The Graduate School is notified of residency classification (in-state or out-of-state) for tuition purposes. Classification is based on information supplied on the Graduate Application for Admission. A student cannot acquire in-state status on the basis of full-time enrollment at a higher educational institution in Tennessee. Proof of in-state residence is the responsibility of the individual.

A student classified out-of-state who (1) works full-time in the state or at Fort Campbell, Kentucky, and (2) desires to attend UT on a part-time basis (maximum 6 hours of coursework per semester), is eligible for a waiver of out-of-state tuition. The student must apply for a waiver prior to the date of registration each semester. Forms are available from the Sr. Admissions Specialist in the Office of Graduate Admissions and Records.

A student wishing to appeal a classification should contact the Sr. Admissions Specialist, who will provide an application for reclassification and a copy of the State regulations. The application must be submitted on or before the last day of regular registration (the day before classes officially begin) for a given semester, if the student is to be considered for reclassification that semester.

RULES OF RESIDENCY CLASSIFICATION

Intent
It is the intent that the public institutions of higher education in the State of Tennessee shall apply uniform rules, as described in these regulations and not otherwise, in determining whether students shall be classified "in-state" or "out-of-state" for fees and tuition purposes and for admission purposes.

Definitions
(1) "Public higher educational institution" shall mean a university or community college supported by appropriations made by the governing body of said public higher educational institution or institutions.

(2) "Residence" shall mean continuous physical presence and maintenance of a dwelling within this State, provided that absence from the State for short periods of time shall not affect the establishment of a residence.

(3) "Domicile" shall mean a person's true, fixed, and permanent home and place of habitation; it is the place where he intends to remain, and to which he or she expects to return when he or she leaves without intending to establish a new domicile elsewhere.

(4) "Emancipated person" shall mean a person who is no longer in the care, custody and control of his or her parent.

(5) "Parent" shall mean a person’s father or mother. If there is a non-parental guardian or legal custodian of an unemancipated person, then "parent" shall mean such guardian or legal custodian; provided, that there are not circumstances indicating that such guardianship or custodianship was created primarily for the purpose of conveying the status of an in-state student on such unemancipated person.

(6) "Continuous enrollment" shall mean enrollment at a public higher educational institution or institutions of this State as a full-time student, as such term is defined by the governing body of said public higher educational institution or institutions, for a normal academic year or years or the appropriate portion or portions thereof since the beginning of the period for which continuous enrollment is claimed. Such person need not enroll in summer sessions or other such inter-sessions beyond the normal academic year in order that his or her enrollment be deemed "continuous." Enrollments shall be deemed continuous notwithstanding lapses in enrollment occasioned solely by the rescheduling of the commencement and/or termination of the academic years, or appropriate portion thereof, of the public higher educational institutions in which such person enrolls.

Rules for Determination of Status
(1) Every person having his or her domicile in this State shall be classified "in-state" for fee and tuition purposes and for admission purposes.

(2) Every person not having his or her domicile in this State shall be classified "out-of-state" for said purposes.

(3) The domicile of an unemancipated person is that of his or her parent. Unemancipated students of divorced parents shall be classified "in-state" when one parent, regardless of custodial status, is domiciled in Tennessee.

Out-of-State Students Who Are Not Required to Pay Out-of-State Tuition
(1) An unemancipated, currently enrolled student shall be reclassified out-of-state should his or her parent or guardian not have been domiciled in the State, remove from the State. However, such student shall not be required to pay out-of-state tuition nor be treated as an out-of-state student for admission purposes so long as his or her enrollment at a public higher educational institution or institutions shall be continuous.

(2) An unemancipated person whose parent is not domiciled in this State but is a member of the armed forces and stationed in this State or at Fort Campbell pursuant to military orders shall be classified out-of-state, but shall not be required to pay out-of-state tuition. Such a person, while in continuous attendance toward the degree for which he or she is currently enrolled, shall not be required to pay out-of-state tuition if his or her parent thereafter is transferred out of the State.

(3) A person whose domicile is in a county of another state lying immediately adjacent to Montgomery County, or whose place of residence is within thirty (30) miles of Austin Peay State University shall be classified out-of-state but shall not be required to pay out-of-state tuition at Austin Peay State University. Provided, however, that there shall be no teacher college or normal school within the non-resident’s own State, of equal distance to said non-resident's bona fide place of residence.

(4) Part-time students who are not domiciled in this State but who are employed full-time in the State, or who are stationed at Fort Campbell pursuant to military orders, shall be classified out-of-state but shall not be required to pay out-of-state tuition. This shall apply to part-time students who are employed in the State by more than one employer, resulting in the equivalent of full-time employment.

(5) Military personnel and their spouses stationed in the State of Tennessee who would be classified out-of-state in accordance with other provisions of these regulations will be classified out-of-state but shall not be required to pay out-of-state tuition.

(6) A person who is domiciled in the Kentucky counties of Fulton, Hickman, or Graves shall be classified out-of-state and shall not be required to pay out-of-state tuition at The University of Tennessee at Martin. If qualified for admission, an exemption is on condition that Murray State University in Murray, Kentucky, continue to admit Tennessee residents from selected Tennessee counties to enroll at that institution without payment of out-of-state tuition.

(7) Any dependent child not domiciled in Tennessee but who qualifies and is selected to receive a scholarship under the Dependent Children Scholarship Act (T.C.A. 49-4-704) because his or her parent is a law enforcement officer, fireman, or emergency medical service technician who was killed or totally and permanently disabled while performing duties within the scope of employment, shall be classified out-of-state but shall not be required to pay out-of-state tuition.

(8) The spouse of a student classified as "in-state" shall also be classified "in-state."

(9) Students not domiciled in Tennessee but who are selected to participate in specified institutional undergraduate Honors Programs shall be classified out-of-state but shall not be required to pay out-of-state tuition.

(10) A person whose domicile is in Mississippi County, Arkansas, or either Denton County or Fentress County, Missouri, and who is admitted to Dyersburg State Community College, shall be classified out-of-state but shall not be required to pay out-of-state tuition.

(11) A person who is not domiciled in Tennessee, but has a bona fide place of residence in a county which is adjacent to the Tennessee state line and which is also within a 30 mile radius (as determined by the THEC) of a city containing a two-year TBR institution and who is admitted to a two-year TBR institution, shall be classified out-of-state but shall not be required to pay out-of-state tuition. The two-year institution may admit only up to three percent (3%) of the full-time equivalent attendance of the institution without out-of-state tuition. (THEE) may adjust the number of the non-residents admitted pursuant to this section every three (3) years.
University Fees

University fees and other charges are determined by the Board of Trustees and are subject to change without notice. All student fees are due in advance.

All charges and refunds will be made to the nearest even dollar. All charges are subject to subsequent audit and verification. The University reserves the right to correct any error by appropriate additional charges or refunds.

All students must confirm their attendance by 1) making the minimum payment, or 2) signing the Confirmation of Attendance Form if no fees are due by the student. The schedule will be cancelled if one of the above is not accomplished each term on or before the published due date. This includes graduate assistants, teaching assistants, teaching associates, research assistants, staff, and others whose fees may be billed, prepaid, or waived. Late registration fees are applicable to students who register during Final Registration.

No student is authorized to attend classes who has not registered and satisfied his/her payment of fees.

The University is authorized by statute to withhold diplomas, grades, transcripts, and registration privileges from any student until all debts and obligations owed to the University are satisfied.

The general fees for graduate students in effect at the time of publication are as follows:

**APPLICATION FEE**

Each graduate application for admission must be accompanied by a non-refundable fee of $35 before it will be processed (fee not required if: (1) former UT graduate student; (2) paid to UT Graduate School within the previous 12 months; or (3) paid and attended graduate school within UT System).

If a student applies but does not enter graduate school within twelve months after date of requested admission, the file will be destroyed, and it will be necessary to resubmit the application fee and a new application. This fee is not refundable.

**VOLXPRESS**

VOLXPRESS is the University of Tennessee's centralized accounting system that allows students to pay all of their fees and charges with one check by mail. Through VOLXPRESS, students are mailed statements that include their class schedule, drop/add activity, current tuition and fees, fee waiver information, fines and past-due amounts, pending financial aid that can be credited toward their accounts, any excess funds from scholarships and/or loans, and choices about how to receive them.

VOLXPRESS is a convenient method for students to take care of business from home. Students who register and pay early will receive the greatest benefit if the payment deadlines are observed.

Each student must submit any change of billing address to the Enrollment Data Services Office to ensure timely receipt of a VOLXPRESS statement. Each Timetable of Classes lists the dates of registration and when and if statements will be mailed.

**IN-STATE FEES**

<table>
<thead>
<tr>
<th>Fall 1999</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINTENANCE FEE</td>
<td>$1,653</td>
</tr>
<tr>
<td>Full Time (9 hours or more)</td>
<td></td>
</tr>
<tr>
<td>Per Semester</td>
<td>$1,653</td>
</tr>
<tr>
<td>Part Time (8 hours or less)</td>
<td>$184 per credit (or audit) hour or fraction thereof; minimum charge $184.</td>
</tr>
</tbody>
</table>

**OUT-OF-STATE FEES**

<table>
<thead>
<tr>
<th>Fall 1999</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINTENANCE FEE AND TUITION</td>
<td>$4,687</td>
</tr>
<tr>
<td>Full Time (9 hours or more)</td>
<td></td>
</tr>
<tr>
<td>Per Semester</td>
<td>$4,687</td>
</tr>
<tr>
<td>Part Time (8 hours or less)</td>
<td>$522 per credit (or audit) hour or fraction thereof; minimum charge $522.</td>
</tr>
</tbody>
</table>

All students both in- and out-of-state are required to pay the established maintenance fee. Tuition is required of all students who are classified as non-residents for fee assessment purposes.

**UNIVERSITY PROGRAMS AND SERVICES FEE**

| Full Time (9 hours or more) | $150 |
| Per Semester | $150 |
| Part Time (8 hours or less) per credit (or audit hour) | $10 |
| Per Semester | $10 |
| Per Summer Term | $7 |

Note: The Programs and Services Fee is non-refundable.

The purpose of the University Programs and Services Fee is to provide non-instructional facilities and programs of an educational, cultural, social, recreational, and service nature for UT students. The student health fee is included in the full programs and services fee. Refer to Student Health Insurance and Student Health Service for additional information.

All students enrolled in excess of eight semester hours per term are assessed a Programs and Services fee of $150. Part-time students taking fewer than nine semester hours will be assessed at the rate of $10 per semester hour or fraction thereof.

Graduate, teaching, and research assistants, teaching associates, and fellowship students, who may have a waiver of fees (tuition and/or maintenance), must pay the appropriate University Programs and Services Fee and late payment fee, if applicable.

Knoxville campus students taking a course load of 6-8 hours may elect to pay the full programs and services fee or may elect to pay the student health fee ($48 for fall and spring, $36 for summer) plus the appropriate part-time programs and services fee up to the maximum of $150.

Knoxville campus students taking 5-3 hours may elect to pay the student health fee ($48 for fall and spring, $36 for summer), plus the appropriate part-time programs and services fee.

**TECHNOLOGY FEE**

| Full Time (9 hours or more) | $100 |
| Part Time (8 hours or less) per credit (or audit hour) | $12 |

The purpose of the Technology Fee is to provide all students with improved access to the technological infrastructure, resources, and services at UT.

Graduate, teaching, and research assistants, teaching associates, and fellowship students, who may have a waiver of fees (tuition and/or maintenance), must pay the appropriate Technology Fee.

The Technology Fee is mandatory and may be refunded on the same percentage scale as maintenance and tuition charges.

**MUSIC FEE**

| One half-hour lesson per week per semester | $50 |

Fees and Financial Assistance

[Continue reading the document beyond the visible part]
One-hour lesson per week per semester ........................................... $120

Payable by students receiving individual instruction in music.

**MISCELLANEOUS FEES**

Academic areas, such as Art, Biology, Chemistry, Bowling and Golf, charge fees per specific course sections. Refunds on these fees are determined by the department or on the same percentage as maintenance and tuition.

**GRADUATION FEE**

Master's degree candidates ................................ $30
Doctoral degree candidates .............................................. $75
Doctoral hood rental (optional) ....................................... $5

There are no additional charges for diploma, binding, or microfilm. The graduation fee is non-refundable and is valid for two semesters after the semester in which it is paid. The doctoral hood rental applies only to those students who have not purchased a doctoral hood and are participating in the graduation ceremony.

**PROFICIENCY FEES**

Fees for proficiency examinations are $7 per credit hour for graduate students. See Proficiency Examinations for additional information.

**FEES FOR COURSES NOT TAKEN FOR CREDIT**

Fees for courses audited are the same as for courses taken for credit. For fee purposes, courses listed for 0 credit hours are considered as one-hour courses.

**DEFERRED PAYMENT PLAN SERVICE FEE.......................................... $20**

(See Tuition Payment Plans)

The Deferred Payment Fee is assessed when payment of any part of a student's account is deferred, including accounts which must be billed to outside agencies. It is the student's responsibility to pay all obligations promptly.

**PRIORITY REGISTRATION**

For a priority registered student, payment or a Confirmation of Attendance Form is due by the published due date, whether or not the student has received a statement, or the student's schedule will be cancelled. The due date is published in the Timetable available from the Registration Services Office.

**FINAL REGISTRATION LATE FEE**

For a student who registers during Final Registration (including those who were cancelled during priority Registration), payment of fees or a Confirmation of Attendance Form must be submitted to one of the Bursar's Office locations by the Final Registration due date. This due date will be published in the Timetable available from the Registration Services Office. The Final Registration Late Fee is non-refundable.

Students who register during Final Registration will be assessed a late fee based on the following:

<table>
<thead>
<tr>
<th>Time of Registration</th>
<th>Late Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning of Final Registration through 1st week of classes</td>
<td>$20</td>
</tr>
<tr>
<td>2nd week of classes</td>
<td>$40</td>
</tr>
<tr>
<td>3rd week of classes</td>
<td>$60</td>
</tr>
<tr>
<td>4th week of classes</td>
<td>$80</td>
</tr>
<tr>
<td>After 4th week of classes</td>
<td>$100</td>
</tr>
</tbody>
</table>

Doctoral students who must register retroactively for dissertation credit will be charged a late fee of $35 for each semester of retroactive registration.

**REINSTATEMENT FEE................................. $45**

VOLXpress accounts which have a balance one month prior to the end of a term will be assessed a reinstatement fee of $45. Grades will be withheld until all past due amounts are paid.

**RETURNED CHECK SERVICE FEE POLICY**

All checks are deposited the day they are received. A $20 service charge will be assessed when checks fail to clear the bank on which they are drawn. Returned checks will not be re-deposited. Cash or certified funds are required for payment of the returned check and service charges. Any student who does not respond within 2 weeks from the date of the first notice may be assessed an additional $10 Service Charge.

Failure to clear returned checks will result in the forfeiture of all university services, including the receipt of grades, transcripts, and schedule of classes. Check cashing privileges may be suspended or terminated in accordance with University policy. Failure to pay may also result in additional late fees, collection costs and reasonable attorney fees.

**RETURNED CHECK POLICY**

Payments made by checks that are returned by the bank adhere to the following returned check guidelines:

1. returned check--Check writing/cashing privileges are suspended until the returned check and service charges are paid/cleared.
2. 2nd returned check--If the 2nd returned check is within 1 calendar year of the 1st returned check, check writing/cashing privileges are suspended for 6 months from the date of the second check. If the 2nd returned check is not within 1 calendar year of the first, check writing/cashing privileges are suspended until the returned check and services charges are paid/cleared.
3. 3rd returned check--Check writing/cashing privileges are suspended for 1 year from the date of the third check.
4. 4th returned check--Check writing/cashing privileges are permanently suspended.

**TUITION PAYMENT PLANS**

All student fees are due in advance and should be paid in full by the due date shown on the VOLXpress statement and listed in the Timetable of Classes. Failure to receive a statement does not relieve students of their obligation to pay on or before the due date.

**Deferred Payment Plan**

Students in good financial standing will be offered a deferment of up to 50% of the total charges on their VOLXpress statement. The first payment is due on the published due date and the second payment is due approximately 45 days after the first. All financial aid must be applied toward fees before a deferment will be considered. A deferred payment service fee of $20 is assessed when any portion of tuition, fees, and other charges are deferred, including third party deferments, with the approval of the Bursar's Office. An additional $35 late payment charge will be assessed if the second installment is not paid on or before the due date. Failure to receive a statement does not relieve students of their obligation to pay on or before the due date. An additional $45 reinstatement fee will be assessed if fees are not paid by one month prior to the end of the term.

**Room Plan**

Semester room charges may be paid in monthly installments. The first month's rent, plus a deposit of one month's rent, is due at the beginning of the semester. The remaining installments are due every four weeks.

**REFUNDS**

Refunds are defined as the portion of maintenance and/or tuition and University housing/meal charges due as a rebate when a student withdraws or drops a portion of class hours. Refunds are also processed as a rebate on some fines/penalties paid such as parking fines, library fines, etc. Once a refund is determined to be appropriate, all amounts will be applied toward other outstanding fees/fines owed to the University at the time the refund is issued, including outstanding fees due on the Deferred Payment Plan. Any remaining refund balance will be mailed to the student's billing address. Refunds on payments made by credit card will be applied back to the credit card.

**Refund/Charge of Fees for Withdrawal**

After payment of fees and/or a Confirmation of Attendance Form has been submitted by the student, withdrawal for the semester must be by official notification to the Graduate Admissions and Records Office, 218 Student Services Building. Failure to attend class does not automatically withdraw or drop a student from the University or class.

The effective date of withdrawal is the date the Office of Graduate Admissions and Records is notified by completion of the official withdrawal request form. The appropriate percentage of fees will be charged unless this action is completed by the close of the day before the first official day of classes for the semester. Failure to notify the Graduate Admissions and Records Office promptly when withdrawing could result in a larger fee assessment. Withdrawal does not cancel fees and charges already incurred. All charges and refunds will be made to the nearest even dollar.

The drop/add procedure cannot be used to withdraw from school for the semester.
For a regular academic semester, withdrawal within 5 business days beginning with the first official class start date of the semester permits a 90% refund/10% charge. Specific dates will be printed in the Timetable of Classes. The first class start date is the date on which all classes begin. Withdrawal between 6 and 10 business days beginning with the first class start date of the semester permits an 80% refund/20% charge. Withdrawal between 11 and 15 business days permits a 40% refund/60% charge. Withdrawal between 16 and 20 business days permits a 40% refund/60% charge. A 100% charge is assessed for courses dropped after 20 business days. Refunds, in accordance with the withdrawal refund policy, will be made after the drop deadline.

Financial Aid Withdrawals/Repayments

Repayments are defined as the portion of aid, received by a student after the University direct charges have been paid by that aid, that must be repaid when a student withdraws or is dismissed. The amount of repayment is determined by the Refund/Charge stated previously. Refunds and repayments to the Title IV programs are determined according to the formula published in the current "Federal Student Financial Aid Handbook." The Financial Aid Office is responsible for calculating the amount of the refund/repayment and distributing the correct amount to the financial aid programs according to the Refund/Repayment Allocation Policy.

For first-time students who withdraw on or before the 60% point in time of the enrollment period for which they were charged, the school must calculate a statutory pro rata refund and compare this amount to the refund amount from the state and accrediting agency policies (if any) to determine the largest available refund to the student. If both the state and the accrediting agency policies do not exist or are not applicable, the student's refund is the pro rata refund amount.

For continuing students who withdraw on or before the 60% point of the enrollment period or first-time students who withdraw after the 60% point of the enrollment, the school must calculate the student's refund amounts using the applicable state and accrediting agency policies (if any), compare the resulting refunds, and use the calculation that provides the largest refund. If the state and accrediting agency policies do not exist or are not applicable, the school must calculate the refund under the Federal Refund Policy and the school's policy (if any) and provide the largest refund.

Refund/Charge of Fees for Dropped Courses (continue with a reduced course load)

Students may pay fees computed at the appropriate semester-hour rate as indicated in the fee section. No charge is made for courses dropped during the first 8 business days following the day before the first official semester class begins. An 80% refund/20% charge is made for courses dropped between 9 and 10 business days following the day before the first class begins. A 60% refund/40% charge is assessed for courses dropped between 11 and 15 business days. A 40% refund/60% charge is made for courses dropped between 16 and 20 business days. A 100% charge is made for courses dropped after 20 days.

Students who drop courses and continue with a reduced load are eligible for a refund only if the sum of charges computed at the semester-hour rate for the hours continued, plus the percentage assessed for the hours dropped, results in an amount less than that paid. A course on a student's schedule is officially dropped, and the drop becomes effective, on the date that the change of registration form is processed or the date the drop was entered on the Registration System. Any refund due for dropped courses will be made after the drop deadline.

SUMMER TERM FEES AND EXPENSES

Fees and expenses for the summer semester are the same as for other semesters during the academic year, except for University Programs and Services Fees as previously mentioned. Although the summer term is divided into sessions of varying lengths, tuition and fees are assessed at the regular semester-hour rate up to the drop date. The refund policy covering withdrawal and dropped courses for the summer semester is based on the length of the term for the course(s) dropped. Percentages of refunds are based on the date of withdrawal/drop. See Timetable of Classes for specific dates.

WAIVER OF FEES

Graduate assistants, teaching assistants and associates, research assistants, staff, and others whose fees are billed, prepaid, waived, or partially waived confirm their attendance by making payment or signing a Confirmation of Attendance Form by the due date as published in the Timetable of Classes or the schedule will be cancelled. If an appointment terminates during the term, the student owes the appropriate fees from the termination date until the end of the term. Graduate students are not eligible for UT spouse/dependent discounts.

STUDENT HEALTH INSURANCE

The University makes available, by contract with an insurance company, group health insurance expressly for students. The program is designed to supplement the care provided by the campus Student Health Service and provide basic benefits at low group premium rates. Primary emphasis is placed on hospitalization benefits since inpatient care is not provided on campus. Students not otherwise covered are urged to avail themselves of this or comparable insurance, since paying for hospital care is the student's responsibility.

Information about the insurance is mailed by the company to the student's home, and participation is solicited. Enrollment in the plan (or alternative coverage) is mandatory for international students.

Students may obtain applications from the Student Health Service or the Center for International Education. Except for international students, enrollment for insurance is not part of registration for classes. NOTE: The family health insurance policy should be carefully reviewed, since most family policies do not cover a dependent child after a given age, some as early as nineteen.

IDENTIFICATION CARD

The VolCard is issued to a new student after admission at the appropriate University level or anytime during the year to all students. The VolCard is used in nearly all aspects of campus life to obtain services including meals, vending machines, computers, laundry machines, check cashing, sporting events, cultural attractions, residence halls access, library, recreational facilities and equipment, University Bookstore, and much more. Many students have established debit or charge accounts which are accessed through the use of the VolCard ID.

These cards are non-transferable and may not be duplicated. The VolCard MUST BE CARRIED AT ALL TIMES FOR PURPOSES OF IDENTIFICATION. Students are responsible for the safekeeping of this card and must immediately report it lost or stolen if the card is not in their possession. Failure to notify the VolCard office will make the student liable for any unauthorized charges to the debit or charge accounts the student may have.

To obtain a new VolCard or replace a lost or stolen card, report to the VolCard Office, Room 472, S. Stadium Hall (between gates 12 & 13 at Neyland Stadium) on Stadium Drive. There is a minimum charge of $10.00 for replacement of a VolCard.

FEES FOR SPONSORED INTERNATIONAL STUDENTS

An administrative management fee will be charged to sponsoring agencies of international students whose programs require special administrative or management services beyond those normally provided. Fees are $250 per semester and $100 per summer session.

Financial Assistance

UT offers several types of financial assistance for which graduate students may qualify.

ASSISTANTSHIPS

Graduate assistantships, scholarships, traineeships, and some fellowships are offered through many departments and colleges. Information concerning these types of assistance can be obtained from the department in which the student plans to study. All assistantships are governed by the Policy for the Administration of Graduate Assistantships. See section on Federal, State and University Policies.

FELLOWSHIPS

The Graduate School administers the Milton A. Smith Graduate Fellowships, the Herman E. Spivey Graduate Fellowships and the UT Graduate Fellowships. These
Students must be admitted into a degree program and be enrolled for a minimum of 6 credit hours each semester to receive student loans.

Four types of loan programs are administered by the Financial Aid Office: 1) Federal Perkins Loan (Student Aid Report, SAR, must be on file); 2) subsidized Federal Stafford Loan (SAR must be on file); 3) unsubsidized Federal Stafford Loan (SAR must be on file); and 4) The University of Tennessee Loan. Processing time varies from one loan program to another.

Students who have attended any post-secondary institution other than UT must provide a Financial Aid Transcript to the Financial Aid Office even if no financial aid was received from the previous institution if entrance is at mid-year.

All students receiving financial aid are expected to maintain satisfactory academic progress standards to remain eligible to receive aid. In addition, all students receiving federal financial aid must have a social security number. Information on these standards, applications, and additional information are available from the Financial Aid Office, 115 Student Services Building.

VETERANS BENEFITS

Veterans, reservists and widows or children of certain deceased or disabled veterans, who have been admitted to a degree program, may apply for benefits by contacting the Veterans Affairs Office. Maximum benefits are paid by the Veterans Administration for course loads of 9 or more graduate hours each semester.

Special Federal and State Laws and University Policies

Family Educational Rights and Privacy Act

The Family Educational Rights and Privacy Act provides for confidentiality of student records. However, it also provides for basic identification of persons at UT without the consent of the individual. Release of information to third parties includes directory information such as contained in the campus telephone book and sports brochures. Such information may include name, address, telephone number, date and place of birth, major, dates of attendance, degrees and awards, the most recent previous educational agency or institution attended, participation in school activities and sports, and weight and height (for special activities).

Notice of the categories to be contained in a publication will be given in advance. A period of one week is provided during which a student may request that such information not be released.

Use of Social Security Number

UT requires assignment of an individual student number for internal identification of each student's record. The University began using the social security number as the student identification number prior to 1 January 1975; therefore, federal law allows continued use of this number. However, if a student does not desire to use the social security number, notification to the University must be made at the time of application for admission. A student identification number will then be assigned instead. For prompt and accurate retrieval of records and for conducting business about their own records, students and alumni must give their student identification number. Student identification numbers, whether social security or assigned numbers, are used administratively within the University only and are not given to third parties without expressed consent of the student.

All students receiving federal financial aid must have a social security number.

EEO/Title IX/Section 504 Statement

The University of Tennessee does not discriminate on the basis of race, color, religion, national origin, age, disability, or veteran status in provision of educational opportunities or employment opportunities and benefits. UT does not discriminate on the basis of sex or disability in its educational programs and activities, pursuant to requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Public Law 92-318, Section 504 of the Rehabilitation Act of 1973, Public Law 93-112, and the Americans with Disabilities Act of 1990, Public Law 101-336. This policy extends both to employment by and admission to the University.

Inquiries concerning Title VI, Title IX, Section 504, and the ADA should be directed to the Office of Diversity Resources and Educational Services (DRES): 2110 Terrace Avenue; The University of Tennessee; Knoxville, TN 37996-3650; or telephone (865) 974-2498 (V/TT). Charges of violation of the above policies should also be directed to DRES.

Security Information

In accordance with the Tennessee College and University Security Information Act of 1989 and the Student Right-To-Know and Campus Security Act, The University of Tennessee has prepared a report containing campus security policies and procedures, data on campus crimes and other related information. A free copy of this report may be obtained by any student, employee or applicant for admission or employment from the Office of the Dean of Students, 415 Student Services Building.
Drug-Free Campus and Workplace

In support of the Drug-Free Workplace Act of 1988 (Public Law 100-690) and the Drug-Free Schools and Communities Act of 1989, The University of Tennessee is notifying all students, faculty, and staff of the following University policy approved by the UT Board of Trustees on 21 June 1990.

It is the policy of The University of Tennessee to maintain a safe and healthful environment for its students and employees. Therefore, University policy prohibits the unlawful use, manufacture, possession, distribution, or dispensing of drugs ("controlled substances" as defined in the Controlled Substances Act, 21 U.S.C. 812) and alcohol on University property or during University activities.

Violation of this policy is grounds for disciplinary action-up to and including immediate discharge for an employee and permanent dismissal for a student. Federal and state laws provide additional penalties for such unlawful activities, including fines and imprisonment (21 U.S.C. 841 et seq.; T.C.A. 39-6-401 et seq.). Local ordinances also provide various penalties for drug and alcohol-related offenses. The University is bound to take all appropriate actions against violators, which may include referral for legal prosecution or requiring the individual to participate satisfactorily in an approved drug use/alcohol abuse assistance or rehabilitation program.

Aside from any University policy considerations, the use of illicit drugs and/or the abuse of alcohol may be harmful to your health. Some of the health risks associated with such use/abuse are described below.

Individuals who are paid by The University of Tennessee from federal grants or contracts must notify the University of any criminal drug statute conviction for a violation occurring in the workplace within five days after such conviction. The University is, in turn, required to inform the granting or contracting agency of such violation within ten days of the University's receipt of notification.

Employees and their families needing treatment information should call their local Personnel Office, Employee Assistance Program, or the State of Tennessee Employee Assistance Program (800-468-8369). Students needing treatment information should contact their campus Student Affairs Office, student health center or counseling center.

Alcohol Abuse Health Risks

Liver damage--cirrhosis, alcoholic hepatitis
Heart disease--enlarged heart, congestive heart failure
Ulcers and gastritis
Malnutrition
Cancer--of the mouth, esophagus, stomach, liver
Brain damage--memory loss, hallucinations, psychosis
Damage to fetus if pregnant mother drinks
Death--50% of fatal auto accidents involve alcohol; 31% of suicides are alcoholics

Drug Use Health Risks

Overdosing--psychosis, convulsions, coma, death
Long-term use--organ damage, mental illness, malnutrition, death
Casual use--heat stroke, brain damage, death
Needles--infections, hepatitis, AIDS, death

If a pregnant mother uses drugs, her baby can be born addicted or dead.

Policy for the Administration of Graduate Assistantships

Preamble

Programs of graduate study are designed to transform the individual from student to knowledgeable practitioner or professional scholar. When a graduate assistantship is well conceived and executed, it serves as an ideal instrument to facilitate the desired transformation. The primary goal of an assistantship, then, is to facilitate progress toward the graduate degree. While the student assistant makes progress toward an advanced degree, he or she also receives work experience in a profession under the supervision of a faculty mentor.

The graduate assistant is both student and employee. As a student, the graduate assistant is expected to perform well academically to retain the assistantship. He or she is to be counseled and evaluated regularly by a faculty mentor so as to develop professional skills. As an employee, the graduate assistant is expected to meet teaching, research, and/or administrative obligations. He or she is to work under the supervision of experienced faculty and receive in-service training. In sum, the graduate assistant receives financial support for graduate study by contributing to the teaching and/or research mission of the university. The totality of responsibility may be greater than that required of other students or staff members, but the opportunities for professional development also are greater for the graduate assistant.

- Tennessee Conference of Graduate Schools

Definition

An assistantship is a financial award to a graduate student for part-time work in teaching, administration or research while pursuing study toward an advanced degree. Appointments are normally on a one-to-fourth time basis, and the annual stipend is payable in either nine or twelve equal monthly installments. In addition to the stipend, Graduate Teaching Assistants, Graduate Teaching Associates, Graduate Assistants, and Graduate Research Assistants are entitled to a waiver of fees for the period of appointment in accordance with university policy. University fees include a maintenance fee (required of all students), tuition (additional for out-of-state students), a program and services fee, and a technology fee. The waiver of fees for assistantships applies to maintenance and tuition fees only; it does not include the program and services fee or the technology fee. For Graduate Research Assistants the maintenance fee is paid by the granting agency and is in addition to the stipend paid.

Maintenance fees and tuition waivers apply to appointments at a one-fourth time basis or higher. In this document when graduate assistantship is not capitalized (except in headings), reference is to all types of assistantships at The University of Tennessee.

Types of Assistantships

It is imperative that each department adhere to the UT Faculty Handbook's four categories of assistantships. All departmental guidelines should reflect the descriptions provided in the Handbook (1996, p.35):

Graduate Teaching Assistant

Graduate Teaching Assistants work under the direct supervision of regular faculty members and may be assigned only to duties related directly to instruction. These include such activities as assisting in the preparation of lectures, leading discussion sections, conducting laboratory exercises, grading papers and keeping class records. Assistants may not be given primary teaching and/or evaluation responsibilities nor should they be given duties to support faculty research or those basically clerical in nature.

In consultation with the supervisor, the Teaching Assistant works to gain teaching skills and an increased understanding of the discipline.

Graduate Teaching Associate

Graduate Teaching Associates are advanced graduate students who have been given primary responsibility for teaching undergraduate courses, including the assignment of final grades. No other category of graduate assistant may be so charged. Associates may not be assigned primary responsibilities for teaching and student assessment in courses approved for graduate credit.

Associates must have met the Southern Association of Colleges and Schools (SACS) 18-hour requirement.

Graduate Assistant

Graduate Assistants are appointed to perform various types of duties other than those related directly to teaching or research. Most commonly, these duties relate to supervisory or administrative functions of the University.

Graduate Research Assistant

Graduate Research Assistants perform duties in support of University research, which may or may not relate directly to the students' thesis/dissertation. A student appointed as a GRA works under the direct supervision of his/her major professor. Research assistantships may be financed through funds from grants, contracts, state appropriations designated for research, or the University's internally sponsored programs. Department Heads are responsible for assuring that GRAs receive ample
opportunities to make continuing progress toward their degrees.

WORK ASSIGNMENTS AND RELATED FACTORS

To utilize the four categories of assistantships, the following provisions should be observed:

1. Work assignments for each type of assistantship should be as specific as possible and should be developed to reflect both the needs of the department and each graduate assistant's obligation to make satisfactory progress in his/her program. Therefore, to the extent possible an assignment should appropriately reflect teaching hours, office hours, hours to be spent performing research or other specified tasks. Such specifications should be provided in writing at the time the offer is made.

In situations where the work assignment cannot be specifically described or must be changed from an initial assignment, the graduate assistant should clearly be informed before agreeing to, or continuing in, the assignment.

An important part of each graduate assistant's work assignment is the fostering of professional development. Such development plus variations in departmental needs may result in differences in number of hours per week for carrying out assignments. Thus, weekly work assignments, when specified, are done so in terms of averages. For a one-fourth time appointment, the graduate assistant's normal work time should not exceed 10 hours per week. For a one-half time appointment, the average number of hours should not exceed 20 hours per week. Appointments exceeding 50% must have prior approval of the Graduate School. The normal number of hours for conducting an assignment should be mutually understood by the graduate assistant and immediate supervisor. For percentage efforts not covered by those appointments above, the normal work time per week will be prorated.

2. A one-half time graduate assistant in each of the four categories of assistantships normally should enroll for 6-11 semester hours of coursework. A one-fourth time graduate assistant in each of the four categories of assistantships normally should take 9-13 semester hours. Exceptions to the above must have prior approval of the Head of the student's academic home unit. A student on a one-half time assistantship who takes at least six semester hours will be considered full-time.

The student's academic home unit is responsible for implementing these policies, regardless of the assignment or responsible account. It is therefore essential that the home unit be notified by any other unit responsible for implementing these policies, the appropriate Department Head, the appropriate Graduate Assistant, and the Dean of the College/School involved. If the student feels that a resolution should be sought beyond the Department/College level, the appropriate Department Head, the appeals committees in the home unit or College, and the Dean of the College/School involved. If the student feels that a resolution should be sought beyond the Department/College level, the appropriate Department Head, the appeals committees in the home unit or College, and the Dean of the College/School involved.

The above requirements do not apply to graduate teaching assistants engaged in assignments such as assisting in laboratory sessions, teaching physical education activities, attending needs, teaching and conducting group discussions.

Implementation of the SACS 18-hour Requirement at UT

The appropriate Department Head has responsibility for certifying that the 18-hour requirement is met either through coursework or by documentation that the graduate assistant meets the requirement as an exception (e.g., experience in the performing arts). The Dean and Department Head must sign the appropriate form (APR FORM 1-89) that is attached to the PAO form. This is forwarded to the Office of Human Resource Management. Exceptions should be noted on this form, but a memo and appropriate documentation should be forwarded to the Graduate Office, 540 Andy Holt Tower.

COMPETENCY IN ENGLISH

The University of Tennessee requires all graduate assistants to be competent in spoken English. The specific policy, as it relates to graduate students who teach, is as follows: Since a certain level of competency with English as a spoken language is necessary for effective communication and teaching, all Graduate Teaching Assistants and Graduate Teaching Associates whose first language is not English are required to demonstrate an appropriate level of comprehensibility for classroom teaching by taking the SPEAK test administered by The Graduate School. The Test of Spoken English (TSE) may be taken in lieu of the SPEAK Test. The results of this test will be communicated by The Graduate School to the appropriate department to be used in determining the nature of the student's academic home unit. The appropriate Department Head has responsibility for certifying that a student is competent in spoken English.

Validation of competency in communicating with students in English is required for all students responsible for teaching in an academic program. Thus, first priority of all graduate assistants must be satisfactory progress in their academic program. At the same time, acceptance of an assistantship is predicated on the belief that satisfactory progress can be concurrently achieved in educational and scholarly preparation. Collaborative efforts between graduate assistants and their supervisors should be focused on the goal of satisfactory performance in both areas.

2. In cases where graduate assistants feel that they have a legitimate complaint about any aspect of carrying out their assignments (work hours, duties assigned, pay, work conditions, etc.), they have a right to pursue all established channels to resolve the conflict. In the order that follows, the student should speak to his/her immediate supervisor, the appropriate Department Head, the appeals committees in the home unit or College, and the Dean of the College/School involved. If the student feels that a resolution should be sought beyond the Department/College level, the appropriate Department Head, the appeals committees in the home unit or College, and the Dean of the College/School involved.

3. Graduate assistants' benefits as employees of the University of Tennessee, in addition to fee waivers and stipends elsewhere, include workers' compensation as defined in the Personnel Policies and Procedures Manual under employees' status. The specific wording reads, "Employees so designated [as student employees] receive no benefits other than statutorily required payments which include Workers' Compensation" (Section 105-Pr2-3).

4. Graduate student assistantships (Graduate Assistants, Graduate Teaching Assistants, Graduate Teaching Associates, and Graduate Research Assistants) are of two types: "academic year" and "twelve month or other." Students on academic year appointments for the Fall and Spring terms receive 12 equal monthly payments for the 9 months of service and a waiver of fees for three terms (including the Summer). Students appointed to an academic year appointment beginning in the Spring term have the option of receiving 7 equal monthly payments for the January-July period or 6 equal payments for the February-July period. In both cases a fee waiver is provided for Spring and Summer terms. Graduate students on
"Academic year" appointments have no assistantship responsibilities in the summer term. Students appointed to "12 month or other" appointments receive equal monthly payments for the months of the appointments and have assistantship responsibilities for the full period of the appointment. For these appointments a waiver of fees is provided only for those terms included within the appointments (i.e., a waiver of fees for the summer term requires an appointment which encompasses the summer term in its entirety.) In some situations, a graduate assistant may be appointed for a period shorter than a year (e.g., a semester).

Graduate assistants who are performing satisfactorily are normally reapPOINTed up to the maximum time limit as stated below. In situations where the demands of the department do not call for a job to be continued, reappointment may not be made. In cases where a department has a rotational plan for assistantships, graduate assistants likewise may not be reapPOINTed.

In all cases of appointment and reappointment, the supervisor is responsible for notifying the graduate assistant as early as possible. When an assistantship is not to be renewed, the graduate student should be notified in advance. In most cases, this notice must be given no later than one month prior to the end of the appointment. Specific reasons for not renewing the contract should be given (e.g., discontinuation of the program or grant, significant neglect of duty, unsatisfactory academic performance or progress toward a degree, non-compliance with university policies, etc.). In cases where an assistantship is for one year only, the student should be told this at the time of appointment. In some circumstances, graduate assistants may be given a conditional appointment such as an appointment in which funding of a grant is pending.

The maximum number of years that a graduate assistant can be appointed to an assistantship is three years as a master's student, five years as a doctoral student, or eight years in doctoral programs in which students enter with a baccalaureate degree only. Some units may have maximum time limits that are less than those stated above. Requests for an extension beyond the maximum terms here specified must be made in writing by the academic unit to the Dean of the Graduate School.

5. As students, graduate assistants' rights and responsibilities are defined in the Faculty Handbook section on Student Rights and Responsibilities and the Student Rights and Responsibilities section of the Student Handbook. Additional rights and responsibilities of graduate students are found on the student's copy of the admission status form.

Evaluation/supervision of Graduate Assistants

Departments employing graduate assistants will conduct an annual evaluation of each assistant. The results of the evaluation are made available to the assistant and placed in the student's academic file. Appropriate follow-up also should occur. The evaluation, review with the assistant, and follow-up should focus not only on assistant-related work being done but should be preparatory for future employment, thus providing professional growth. In most cases, a graduate assistant's supervisor shares results of the evaluation with the assistant and takes appropriate follow-up action.

In cases where corrective measures must be taken to remediate deficiencies, the graduate assistant should be notified in writing of recommended action to solve the problem(s). Situations leading to dismissal for cause must be described in writing to the assistant being dismissed. This letter should be written by the supervisor with a copy to the department head. In cases where the assistant feels that university-related factors (facilities, working conditions, improper supervision, etc.) have had negative effects on specific aspects of job performance, a letter to the supervisor would be appropriate.

The immediate supervisor for each graduate assistant is to be identified as early as possible, usually no later than four weeks prior to the commencement of the assistantship. If there will be more than one supervisor per graduate assistant, the specific tasks to be performed for each and the role each supervisor will play (e.g., which one will initiate the evaluation process) should be identified.

The chain of command within each department should be clearly indicated to graduate assistants. Thus, each graduate assistant should know that the immediate supervisor is the person to whom first contact is to be made in job-related questions/directions; followed in turn by a general departmental/school supervisor of graduate assistants (where one exists), the appropriate project director, department head, dean of the college, and Graduate School officials.

Orientation/Training of Graduate Assistants and Graduate Teaching Associates

There must be a thorough, systematic plan of orientation and training of all Graduate Teaching Assistants and Graduate Teaching Associates. Such orientation and training may be done at either the department, college, or university level. It is the responsibility of each supervisor to see that his/her graduate assistant is provided appropriate orientation/training.

There are several kinds of training that should occur beyond the initial orientation/training. Such training is usually specific to a particular job function. The Graduate School provides a seminar for Graduate Teaching Assistants and Graduate Teaching Associates who will be teaching at the University of Tennessee. Presented in several formats, this seminar includes attention to styles of learning and other student characteristics, communicating in the classroom, leading discussions, lecturing, directing laboratory work, using media and computers, designing syllabi, constructing and using tests, grading, evaluating courses and instructors, and similar topics. Special programs are offered for international GTAs. Supervisors of GTAs are responsible for notifying them about departmental and college policies on attendance at these programs.

The Graduate School also offers the GTA Mentoring Program, "Developing Future Faculty as Teacher-Scholars," which is a year-long program of workshops, team meetings, and other activities to support the professional development of UT GTAs.

Orientation/Training of Graduate Assistants and Graduate Research Assistants

Graduate Assistants and Graduate Research Assistants must also participate in a thorough, systematic orientation and training program. This training is usually at the department or college level, but the Office of Research at the University level is available to assist with programs designed to help train the Graduate Research Assistant in various aspects of the job to be done.

One type of specialized training is "on-the-job." Graduate assistants who work in laboratories may receive initial orientation, followed by work experiences which constitute training. In such instances, the "on-the-job" training period should be clearly known by the student assistant.

Accepting/Declining an Assistantship

The University of Tennessee adheres to the following resolution by the Council of Graduate Schools:

Acceptance of an offer of financial aid (such as graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by an entering or prospective graduate student completes an agreement which both student and graduate school expect to honor. In those instances in which the student accepts the offer before April 15, and subsequently desires to withdraw, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining written release from the institution to which a commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to the above resolution that a copy of this resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

Student Services

Black Cultural Center

The Center is an integral part of The University of Tennessee. The Center provides academic, cultural and social outlets through programming and services as an ongoing part of the University's retention efforts. The Tutorial and Early Alert Programs, along with the Resource Library and Computer Lab, serve as an extension to services provided across campus. The Center houses several student organizations that plan activities ranging from Brown Bag Lecture Series, Black History Month activities, the Welcome Week Splash Party, carnivals and renown speakers such as...
Maya Angelou, Tavis Smiley, Cornel West and Alice Walker.

The Center is located at 812 Volunteer Boulevard. The University community is encouraged to visit the facility and take advantage of the opportunities provided for all students.

Career Services

Career Services, located in Dunford Hall, 974-5435, is a university-wide department providing career-related assistance to UT students through a wide range of programs and services. Included in the services offered are two annual career fairs providing opportunities to speak informally with representatives from over 100 different companies about their entry level jobs and hiring practices; a nonprofit career fair involving representatives from numerous area nonprofit organizations; employer information which includes types of majors sought, job descriptions, career profiles, and other pertinent information for hundreds of companies that recruit at UT; a website including valuable links to dozens of other career-related web resources; a part-time employment service for students seeking such positions; and workshops providing instruction in skills and tactics for successful interviewing, resume preparation, business and dining etiquette, and other topics.

On-campus interviews are scheduled during the year, and require registration via a web-based resume system. Thousands of interviews are scheduled each year which include approximately 500 companies, government agencies and school systems. Interviews are scheduled by registrants on the web. Many job listings are also available from the department’s website. Career Services also administers a Credentials Service for doctoral candidates. Setting up a credential file is a simple process involving the submission of a resume and academic transcript, along with letters of recommendation. An alumni placement service offers assistance in the job search after graduation. Also thousands of resumes are referred directly to employers every year to assist students and recent alumni in their job-seeking activity. A web-based resume book is made available to employers.

Career Services registrants have access to video conference interviewing, resume access via the World Wide Web, and other state-of-the-art forms of placement assistance.

Center for International Education

The Center for International Education (CIE), 1620 Melrose Avenue, telephone 974-3177, promotes and supports all aspects of international education and international exchange at UT, both for American students and faculty and for students and faculty from other countries. The administration of official linkage agreements between UT and institutions of higher education in other countries is coordinated by CIE.

American students: CIE provides information and advice about study-abroad options open to UT students, including the exchange programs it administers between UT and universities in thirty countries on six continents. CIE coordinates campus administration of such international grants and scholarships for students as the Fulbright, Rhodes, and Marshall programs, and provides information about other sources of funding for overseas study and research, including the Rotary Foundation, St. Andrews, and German Academic Exchange Service (DAAD) grants. Within its library on study, work and travel abroad, CIE has information about student summer job programs in nine countries.

International students and scholars: CIE provides information and assistance in matters relating to United States visa regulations, to UT requirements for international students, and to UT academic policies and registration procedures. It publishes The Link, a newsletter for UT’s international students and scholars, and administers the insurance policy required of all international students at the University. International student advisors are available to discuss academic and personal concerns. Orientation programs conducted at the beginning of each term facilitate adjustment to the campus and community, as does the international student orientation camp prior to the fall term.

The International House, 1623 Melrose Avenue, is CIE’s on-campus social, recreational, and programming center that serves as a meeting place for international and U.S. students, faculty and staff.

International students seeking admission to UT should write directly to the Office of Graduate Admissions and Records.

Child Care

The Child Development Laboratories, operated by the Child and Family Studies department within the College of Human Ecology, currently offer child care programs for young children ages six weeks to five years. The Child Development Laboratories are accredited by the National Academy of Early Childhood Programs, a division of the National Association for the Education of Young Children. For application and enrollment information, call (865) 974-0843.

The UT Child Care Referral Center, (865) 974-8911, offers free assistance in finding state-licensed child care in a 15-country area surrounding Knoxville.

Dining Services

UT Dining Services recognizes that campus dining is a large part of the college experience. Students have the choice of the following meal plan options depending on the type of dining desired. Meal plans are available to all students living on or off campus.

UNLIMITED ACCESS PLUS PLAN

Unlimited Access means just that; students may enter recently renovated Presidential Court, Sophie’s Place, and Morrill dining facilities anytime during their hours of operation and eat as much as they want, full meals or snacks. Meal plan meals may also be eaten at select retail dining facilities. Certain restrictions apply at these locations. Students also receive $300 bonus bucks per semester.

THE ANY TEN PLAN

Students choose 10 meals weekly that may be eaten at recently renovated Presidential Court, Sophie’s Place, and Morrill dining facilities. Meal plan meals may also be eaten at select retail dining facilities. Certain restrictions apply at these locations. Students also receive $300 bonus bucks per semester.

UNLIMITED ACCESS PLAN

This plan still allows students to eat as much as they want as often as they like at recently renovated Presidential Court, Sophie’s Place, and Morrill dining facilities. Meal plan meals may also be eaten at select retail dining facilities. Certain restrictions apply at these locations. Students also receive $100 bonus bucks per semester.

THE ANY TEN PLAN

Students choose any 10 meals weekly that may be eaten at recently renovated Presidential Court, Sophie’s Place, and Morrill dining facilities. Meal plan meals may also be eaten at select retail dining facilities. Certain restrictions apply at these locations. Students receive $300 bonus bucks per semester.

THE VARSITY INN FIFTEEN PLAN

Fifteen meals per week are provided to be eaten exclusively at Varsity Inn Dining. These 15 meals include breakfast, lunch, and dinner, Monday through Friday. Bonus bucks are not included with the Varsity Inn Fifteen Plan.

**Rates subject to final University approval.
**Local sales tax is added to the price of off-campus meal plans.
**Meal plan contracts cover the entire academic year (i.e. fall and spring semesters). Meal plan is not valid between semesters and during Spring Break.
**Meal week begins on Monday and ends on Sunday.
**Bonus bucks may be used whenever students choose any Dining Services’ facility on campus, including convenience stores. Unused bonus bucks are forfeited at the end of the semester.
**The AllStar Account and The Diner’s Club may also be used in Dining Services’
facilities. Please call the VolCard office at 974-3430 for more information on these accounts.
To initiate or amend a meal plan, call UT Dining Services at 974-4111.

Disability Services

Disability Services (DS) seeks to eliminate the barriers that students with disabilities encounter and to work with them to achieve and maintain individual autonomy. The program's primary objective is to provide these students with access to the academic, social, cultural, and recreational opportunities of the University. Prospective students are encouraged to contact DS personnel so that they can be assured that the campus facilities and services are adequate to meet their needs. The staff can be of service to the students to the extent that their individual needs are made known. Contact with the students prior to registration enables DS staff to better access the need for interpreters, readers, accessible and other support services. When sending documentation to establish contact with Disability Services, students should include an address, fax or telephone number. Van service is also provided to those individuals with mobility limitations, whether permanent or temporary. Documentation of disability from an attending physician or the Student Health Center is required.

Participation in the services program is on a voluntary basis. Residence Hall services are provided to all students who have paid the full University Programs and Services Fee or, if part-time, any student who has paid the optional student health service fee.

The Center serves as a clinical observation and education facility for students majoring in Speech-Language Pathology or Audiology. It also serves as a community hearing and speech center providing diagnostic and treatment services for persons of all ages exhibiting communication disorders/differences.

Housing

UNIVERSITY APARTMENTS
The University has provided excellent apartment facilities in several locations for married students with or without families. Apartments not needed to house married students are made available to single graduate and professional students. Information and application for these facilities may be secured from the Department of University Housing, 405 Student Services Building.

RESIDENCE HALLS
The University, established by a government that recognized no distinction among religious beliefs, seeks to promote no creed nor to exclude any. However, it will always be diligent in promoting the spiritual life of its students in part through its work with the Campus Ministers Council.

Student Services 35

Minority Student Affairs

The Office of Minority Student Affairs is housed in a four-story, free standing structure—the Black Cultural Center. The office serves as a link between the University and its minority student population. The Office, located at 812 Volunteer Blvd., provides academic, educational, social and cultural programs to assist with the academic performance and retention of African-American students. Programming through the Office includes mentorship programs for freshmen and upperclassmen, academic support, leadership opportunities, graduate networking, and workshops for all students on a variety of academic, intellectual, and social topics. Through the Office, students learn to share ideas and embrace a sense of community.

Religious Resources

The Student Counseling Services Center (SCSC) provides services designed to help students with educational, vocational, personal, and social problems. Professional counselors work with students in a setting that allows for confidential discussion of personal, social, and academic matters. Services include crisis intervention, group therapy, individual therapy, academic classes, consultation with faculty/staff/students, and various workshops and presentations.

To access services, students may come to the center during walk-in hours Monday-Friday from 10:00-11:30 a.m. and 1:00-3:30 p.m. If schedules will not accommodate these terms, students can call the Center to schedule other times. Anyone experiencing a crisis during the week is seen immediately between 8:00 a.m. and 5:30 p.m. After these hours, students are encouraged to contact the UT Medical Center emergency room.

The Center is located at 402 Student Services Building and can be reached at 974-2196 or see our web page at http://web.utk.edu/~counsel.

Student Health Service

Health services provided by the University are available to any student who has paid the health fee (either through paying the full University Programs and Services Fee or, if taking fewer than 9 hours but at least 3 hours, paying the optional health fee). These outpatient services are available continually throughout every term.
Students requiring hospitalization are generally admitted by an appropriate specialist to The University of Tennessee Memorial Hospital; insurance reimbursement is accepted as payment in full for all services except inpatient care and specialty consultation. Transportation service for the campus is provided by the Campus Police and the Escort Van Service.

Students requiring meningitis immunizations.

Students requiring hospitalization are generally admitted by an appropriate specialist to The University of Tennessee Memorial Hospital; insurance reimbursement is accepted as payment in full for all services except inpatient care and specialty consultation. Transportation service for the campus is provided by the Campus Police and the Escort Van Service.

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The College of Agricultural Sciences and Natural Resources began in 1869 when the University was designated as Tennessee’s Federal Land-Grant Institution. As such, the University was enabled for the first time to offer instruction in agriculture. Graduate instruction began as early as 1889. The College is not only an academic unit of the University of Tennessee but is (with the Agricultural Experiment Station, the Agricultural Extension Service and the College of Veterinary Medicine) one of the four administrative units of the University of Tennessee’s Institute of Agriculture.

There are many shared resources and positive interactions between various units of the Institute. For example, most of the faculty in the College of Agricultural Sciences and Natural Resources hold joint appointments in the Agricultural Experiment Station and are actively involved in significant basic and applied research in agriculture and the associated natural resources. On campus and field research laboratories are utilized in the instructional programs of the College; extension and research activities provide many students excellent part-time job opportunities. Very significant is the fact that the Agricultural Experiment Station provides more than 100 graduate research assistantships to support graduate students.

The unique association the College has with UT and the other units of the Institute of Agriculture makes it possible for the College to offer comprehensive high quality graduate programs.

Graduate programs of the College of Agricultural Sciences and Natural Resources are designed to prepare men and women for positions of leadership in industry, state and federal government, teaching, research, and extension.

The graduate student is expected to demonstrate a thorough knowledge of the subject matter in his/her specialized field of study and its relationship to the sociological, economic, and environmental impact on society. The student must demonstrate the ability to plan, conduct, analyze, and report original research. Emphasis is given to intellectual growth and the development of scholarly habits of study, reasoning and analysis so that the graduate will continue to grow and develop professionally throughout his/her career.

MASTER OF SCIENCE PROGRAMS

Programs of graduate study leading to the Master of Science degree are offered through all departments in the College of Agricultural Sciences and Natural Resources. The graduate program may be entirely in one major subject or may include subject matter areas related to the major. Both majors and minors are available in Agricultural Economics, Agricultural and Extension Education, Animal Science, Biosystems Engineering, Biosystems Engineering Technology, Entomology and Plant Pathology, Food Science and Technology, Ornamental Horticulture and Landscape Design, and Plant and Soil Science. Majors only are available in Forestry and Wildlife and Fisheries Science, and minors are available in General Agriculture and Rural Sociology.

The minor in General Agriculture requires 12 hours of coursework. A complete listing of majors is shown on the Majors and Degree Programs Chart.

DOCTORAL PROGRAMS

Graduate study leading to the Doctor of Philosophy degree in Animal Science, Biosystems Engineering, Food Science and Technology, and Plant and Soil Science is offered in the college.

The UT School of Architecture offers a program of professional studies which prepares its graduates for the practice of architecture. This is accomplished through a
five-year Bachelor of Architecture degree program or through the Master of Architecture degree program for students already having a baccalaureate degree.

The College of Arts and Sciences.

Lorayne Lester, Dean
Annie Mayhew, Associate Dean
Stuart Rigby, Associate Dean
Otis Stephens, Associate Dean

Deans

Anthropology
Art
Audiology and Speech Pathology
Biochemistry and Cellular and Molecular Biology
Botany
Chemistry
Classics
Computer Science
Ecology and Evolutionary Biology
English
Geography
Geological Sciences
History
Life Sciences
Mathematics
Microbiology
Modern Foreign Languages and Literatures
Music
Philosophy
Physics and Astronomy
Planning
Political Science
Psychology
Religious Studies
Sociology
Theatre

Facilities for Research and Service

Center for Applied and Professional Ethics
Center for Environmental Biotechnology
Center for Psychoanalysis and the Humanities
Center for Quaternary Studies of the Southeastern U.S.
Center for the Study of War and Society
Child Behavior Institute
Forensic Anthropology Center
Hearing and Speech Center
Institute for Applied Microbiology
Institute for Resonance Ionization Spectroscopy
Joint Institute for Heavy Ion Research
Psychological Clinic
Science Alliance
Social Science Research Institute

The University of Tennessee began as a liberal arts institution. Before the turn of the century, emphasis was placed on the liberal education. However, the liberal arts continued to thrive, emerging as a college in 1904. Thus, the College of Liberal Arts (now known as the College of Arts and Sciences) is one of the oldest established colleges in the University.

The College of Arts and Sciences consists of a wide array of academic disciplines and interdisciplinary programs. The central purposes of a liberal education include the encouragement of intellectual tolerance, a dedication to the quest for knowledge as a worthwhile goal in and of itself, and the cultivation of a responsible, creative individual mind. These qualities enable one to develop an ability to reason and to express oneself clearly, an incentive to absorb emerging knowledge, and a competence to confront the uncertainties of human experience. Faculty research and creative activity is the foundation on which education in this College is built. As a result of that endeavor, the lives of students are enriched and the world's body of knowledge grows.

The College of Arts and Sciences offers programs in twenty-seven academic disciplines leading to eight advanced degrees: M.A., M.S., M.F.A., M.Math, M.Music, M.P.A., M.S.P., and Ph.D. See the Majors and Degree Programs chart for specific majors and degrees.

GENERAL INFORMATION

Foreign Study Courses

Foreign study courses offered in some departments of the college provide an opportunity to undertake independent study outside the United States. Prior to departure the student must have a plan of study approved by the department head and a supervising faculty member of the department concerned. Credit will be given only upon fulfilling all requirements set by the department and may vary from 1-15 hours. The maximum credit that may be applied toward a degree in the college is established in each individual case by the department in which the student is working.

Off-Campus Study

Recognizing that learning is not restricted to formal classroom situations, the college allows students to earn credit toward graduation for approved off-campus study. Such study may be undertaken only with prior approval of the faculty member and the department concerned. It may include certain kinds of work experiences, community involvement, or political campaigns. Credit per semester will vary from 1-15 hours. The maximum credit that may be applied toward a degree in the college is established in each individual case by the department in which the student is working.

Independent Study

Certain educational goals may best be met through independent study by an individual under the direction of a faculty member. Students who wish to do such independent work should obtain the approval of the faculty members and the departments concerned prior to embarking upon their study. Credit per semester will vary from 1-15 hours. The maximum credit which may be applied toward a degree in the college is established in each individual case by the department in which the student is working.

College of Business Administration

C. Warren Neel, Dean
Sarah F. Gardial, Assistant Dean, Full-Time MBA Program
Patricia Postma, Assistant Dean, Center for Executive Education
David W. Schumann, Associate Dean for Research and Technology
Jan R. Williams, Associate Dean for Academic Affairs
William F. Fox, Director, Center for Business and Economic Research
John E. Riblitt, Director of Executive Development Programs

Departments

Accounting and Business Law
Economics
Finance
Management
Marketing, Logistics and Transportation
Statistics

Facilities for Research and Service

Center for Business and Economic Research
Center for Executive Education

The College of Business Administration was originally the School of Commerce, dating back to 1919. Commerce was changed to Business in 1937 and gained college status in 1947. The college-wide MBA program was approved in 1966 and the doctoral program in 1971. Graduate programs of the College of Business Administration are designed to prepare men and women to assume positions in the increasingly complex world of business and industry, teaching and research, and government.

Viewing the business firm as an operating in dynamic social, political, and economic environments that demand leaders capable of dealing with innovation and rapid change, the College places central importance on development of students' thought processes and leadership potential. Emphasis is focused on flexibility of mind, receptivity to new ideas, and capacity to adapt one's reasoning powers. Our objective is to encourage the student to develop the ability to reason analytically and logically, and to develop a commensurate plan of action. Above all else, we strive to instill the irrepressible desire to continue to learn and grow in knowledge throughout the student's life.

The College of Business Administration has made a commitment to total quality management by integrating the principles of productivity through quality and statistical process control throughout the graduate curriculum. Interdisciplinary partnerships are encouraged among academic units in the College, with other University academic units and with the private sector, enhancing the process of inquiry and critical thinking which is crucial to total quality management.

The College of Business Administration is fully accredited by the American Assembly of Colleges Schools of Business and is
associated with other leading graduate schools of business as a member of the Graduate Management Admission Council.

GRADUATE PROGRAMS

The College of Business Administration offers programs leading to five advanced degrees: the Doctor of Philosophy with majors in Business Administration, Economics, Industrial and Organizational Psychology, and Management Science; the Master of Arts with a major in Economics; the Master of Science with majors in Management Science and Statistics; the Master of Accountancy; and the Master of Business Administration.

The two College-wide programs, the MBA and the Ph.D. in Business Administration, are described in Business Administration, Fields of Instruction. Descriptions of other degree programs are under the appropriate departmental or program headings.

FINANCIAL ASSISTANCE

A limited number of teaching and other assistantships that require from 10 to 20 hours of service per week are available through the departments of the College. Remuneration includes remission of fees and tuition as well as a monthly stipend. Awards are generally made on the basis of scholarship and performance on the appropriate (GMAT or GRE) admission test. Application forms may be obtained in any of the departments. Information on College-administered fellowships is available from the appropriate department or office.

Applications must be received by March 1 for consideration of assistantships and fellowships to be awarded for the following fall term.

College of Communications

Dwight L. Teeter, Jr., Dean
C. Edward Caudill, Associate Dean for Graduate Studies
Eric Haley, Associate Dean for Undergraduate Studies

Departments and Schools
Advertising
Broadcasting
Journalism
Speech Communication

Facility for Research and Service
Communications Research Center (CRC)

The College of Communications grew out of the School of Journalism, which was originally located in the College of Business Administration. The Department of Speech Communication became part of the College of Communications in 1987. The master's program began in 1968 under Journalism and was changed to Communications after the School gained college status in 1970. The doctoral program was initiated in 1974.

A chair of excellence was established in 1987 to support a distinguished professorship in science, technology, and medical writing.

Communications media and interpersonal communications are vital forces in today's complex society. Specialization, gaps among segments of society, and the nature of world conflict point to the need for more understanding of how people communicate.

Educating men and women in the perceptive understanding of the communications field is a necessity. The graduate programs in the College acquaint students with the nature of communications and prepare them for professional work in many fields.

The College of Communications offers the Master of Science and the Doctor of Philosophy degrees with a major in Communications.

In addition, Communications is available as a minor for students majoring in other departments. Required coursework will be selected after discussion with the major advisor and an advisor from the College of Communications.

The M.S. program is accredited by the Accrediting Council on Education in Journalism and Mass Communication. The College is a member of the Association of Schools of Journalism and Mass Communication and the Broadcast Education Association.

Applications must be received by March 1 for consideration of assistantships and fellowships to be awarded for the following fall term.

College of Education

C. Glennon Rowell, Dean
Thomas W. George, Associate Dean for Academic Programs and Administration
Lynn C. Cagle, Interim Associate Dean for Professional Licensure Programs, Instructional Support and Faculty Development

Departments
Counseling, Deafness and Human Services
Educational Administration and Cultural Studies
Educational Psychology
Exercise Science and Sport Management
Instructional Technology, Curriculum and Evaluation
Theory and Practice in Teacher Education

Facilities for Research and Service
Bureau of Evaluation, Research, and Service
Center for Literacy Studies
Center for Physical Activity and Health
Curriculum Lab
Exercise Physiology Lab/Biomechanics Lab
Institute for Assessment and Evaluation
Institutional Services Center
Reading Center
Tennessee Internship Consortium in Professional Psychology

Education programs were first offered at the graduate level in 1905 by the School of Education. Through the Summer School of the South, the programs thrived, and the School became a College in 1926. The Ed.D. program was established in 1950, and the college-wide Ph.D. program began in 1979.

The College of Education, as a professional school, promotes critical inquiry, reflection, and social action through interdisciplinary studies. Its graduates are prepared to work in a changing, multicultural world in leadership roles in educational programs and institutions, health and social institutions, and private and corporate sectors.

The College is committed to providing lifelong learning for both faculty and students by promoting courses of study that involve students and faculty in academic peer relationships that stress shared responsibility for learning and for the discovery of new knowledge. The College is committed to research, scholarship, and creative work that results in superior teaching and service to the community and to the professions. The College is committed to working towards equity and economic and social justice within the University community and throughout the broader society.

The College of Education is fully accredited by the Southern Association of Colleges and Schools. All teacher education and school-related licenses and degree programs are fully accredited by the National Council for Accreditation of Teacher Education (NCATE) and the Tennessee State Department of Education. Specific program accreditations are found under the respective Fields of Instruction.

MASTER OF SCIENCE PROGRAMS

On the master's level, professional study may be planned (1) in one of the areas listed on the Majors and Degree Programs chart, (2) in appropriate combinations of these areas, or (3) in combinations of one or more of these areas with appropriate subjects or areas in other colleges.

Students in the College of Education's Track 2 master's programs (i.e., five-year teacher preparatory programs) must gain admission to The Graduate School before enrolling in internship.

Degree program requirements are described under Education, Fields of Instruction.

SPECIALIST IN EDUCATION PROGRAM

The College of Education offers a program leading to the Specialist in Education with a major in Education.

Degree program requirements are described under Education, Fields of Instruction.

DOCTORAL PROGRAMS

The College of Education offers programs of advanced study leading to the Doctor of Education and the Doctor of Philosophy, both with a major in Education.

Degree program requirements are described under Education, Fields of Instruction.
The College of Human Ecology

James D. Moran III, Dean
Billie J. Collier, Associate Dean for Research and Graduate Studies
Deborah Smith, Assistant Dean for Outreach and Undergraduate Studies

Department
- Child and Family Studies
- Consumer and Industry Services
- Health and Safety Sciences
- Human Resource Development
- Nutrition

Facilities for Research and Service
- Center of Excellence for Materials Processing
- Child Development Laboratories
- Nutrition Institute
- Small Animal Research Laboratory
- Textiles and Nonwovens Development Center
- Tourism Institute

Human Ecology brings together the natural and social sciences to enhance the well-being of individuals, families, and communities across the life span.

The University of Tennessee was one of the first institutions of higher education in the South to offer home economics, with the first class being offered in 1897. Initially called a School of Home Economics, it combined with Agriculture in 1947 to become the College of Agriculture and Home Economics. In 1959, the two colleges became separate units, although they continue to share resources. In 1985 the name was changed to Human Ecology, reflecting its focus on people interacting with their environments.

Graduate study in Human Ecology prepares the student for teaching, research, and public service in colleges and universities or managerial positions in government, business, and industry.

The Master of Science degree is offered with majors in Child and Family Studies, Health Promotion and Health Education, Human Resource Development, Nutrition (including public health nutrition), Recreation, Tourism and Hospitality Management, Safety Education and Service, and Textiles, Retailing and Consumer Sciences; the Master of Public Health degree is offered with a major in Public Health; and the Doctor of Philosophy degree is offered with a major in Human Ecology and concentrations in child and family studies, community health, human resource development, nutrition science, retail and consumer sciences, and textile science. For additional information, contact the Associate Dean, College of Human Ecology, The University of Tennessee, Knoxville, TN 37996-1900, (865) 974-5224.

FACILITIES FOR RESEARCH AND SERVICE

The Small Animal Research Lab, housed in the Jessie Harris Building, has received certification by the American Association for Accreditation of Laboratory Animal Care (AAALAC). Renovated in 1985, it has strict environmental controls, an operating theater and diet preparation room.

The College of Human Ecology participates with the College of Engineering in the Center of Excellence for Materials Processing. These research efforts in Textile Science are also supported by the Textiles and Nonwovens Development Center (TANDEC). The Child Development Laboratory (CDL) serves as a research and training facility for students in the College.

The mission of the Institute of Tourism and Leisure Industries is to serve as a catalyst for stimulating economic growth by providing a medium through which tourism and leisure industries can collectively develop and focus on strategies that will address how to improve the economic climate and overall quality of life in the region.

The Nutrition Institute provides a communication link for all efforts in nutrition sciences, coordinates collaborative research efforts, and provides a forum for interchange with the larger nutrition community.

Refer to the section on Facilities for Research and Service for additional information.

College of Law

Thomas C. Gallihhan, Jr., Dean
John L. Sobieski, Jr., Associate Dean
Rachel E. Inman, Assistant Dean

The University of Tennessee College of Law commenced operation in 1890 and has continuously sought to provide high-quality legal education in a university community.

While the principal objective of the college is to prepare students for the private practice of law, its total mission is more broadly conceived. The college exposes students to the legal issues of our society enabling them to develop analytical skills with respect to decisional law and statutes, the ability to communicate effectively, an awareness of the historical growth of the law, an appreciation of the interrelationship of law and society, and the ability to use law as an implement of societal control and development.

Students are thus equipped to serve their communities not only as advocates and counselors, but as policy makers and active, responsible citizens.

THE PROFESSIONAL PROGRAM

The program of the college has three dimensions: teaching and learning, research and appraisal of our legal systems and institutions, and service to the community. Each plays a significant role in the college as a modern law center.

The teaching and learning element of legal education at the college involves a cooperative classroom interaction between faculty and students in the analytical study of a host of questions and problems found in today's legal profession. These involve decisional law, statutory interpretation, administrative regulation, techniques of trial and appellate advocacy, and the roles and
responsibilities of the lawyer in advising and representing clients. While proper consideration is given to the problems of Tennessee law, the course of study is conducted with a view toward providing an awareness and understanding of the regional and national perspective to prepare students for service in any state.

The college is also directly involved in providing service to the community. A major element of public service is centered in the Legal Clinic where students, under the guidance of skilled and experienced licensed practitioners, provide legal services to clients. Additionally, through research, consultation, and other services to legal institutions and groups within the state, the college seeks to participate in the development and improvement of the society in which its students may eventually practice law.

In combination, the direction and objectives of the college lead to the development of a narrow technician, but of a student of the law with the perspective, breadth, and understanding necessary to accomplish the many tasks assigned by society to the legal profession.

**GRADUATE PROGRAM**

Two dual degree programs are available in conjunction with the College of Law: the J.D.-MBA program with the College of Business Administration and the J.D.-M.P.A. program with the Department of Political Science. Refer to details under the respective field of instruction.

Graduate students in other disciplines may also take law courses upon approval of the College of Law and the major professor. See Law under Fields of Instruction.

**College of Nursing**

Joan Creasia, Dean
Carol Seavor, Associate Dean for Academic Affairs
Maureen Groer, Associate Dean for Research and Evaluation
Martha Allgood, Director of Master's Program
Sandra P. Thomas, Director of Doctoral Program
Johnie Mozingo, Director of Undergraduate Program

Facilities for Research and Service
Center for Nursing Practice
Center for Nursing Research

The College of Nursing was established in July 1971. The master's program was initiated in 1976 and approval for the doctoral program was granted in 1988. More specific information about the programs may be obtained under Nursing, Fields of Instruction, or by contacting the Director of M.S.N. or Ph.D. Program, The University of Tennessee, College of Nursing, 1200 Volunteer Blvd., Knoxville, TN 37996-4110, (865) 974-4151.

**MASTER OF SCIENCE IN NURSING**

The general purpose of the M.S.N. program is to prepare nurses at the graduate level to function as advanced practitioners, teachers, or managers in a variety of health care or educational settings. The program is accredited by the National League for Nursing Accrediting Commission that may be contacted at 61 Broadway, New York, NY 10006, Tel: 1-800-669-9656, and is unconditionally approved by the Tennessee Board of Nursing. Students admitted to the program select a concentration in adult health nursing, family nurse practitioner, mental health nursing, nursing administration, and nursing of women and children.

**THE DOCTORAL PROGRAM**

The College of Nursing offers a doctoral program leading to the Ph.D. with a major in Nursing. The doctoral program prepares nursing scholars capable of integrating research, theory, and practice into their roles as researchers, educators, and/or administrators. This unified program offered jointly with the University of Tennessee, Memphis College of Nursing enables students to complete all or part of the program at either site. The dissertation must be completed in its entirety at one site.

**College of Social Work**

Karen Sowers, Dean
William J. Bell, Associate Dean, Nashville
Judith Fiene, Associate Dean, Knoxville
Hugh Vaughn, Acting Associate Dean, Memphis
Paul M. Campbell, Director, Office of Social Work Research and Public Service
Charles Glisson, Director, Children's Mental Health Services Research Center

The College of Social Work began as the Nashville School of Social Work, founded in 1942 under the auspices of Vanderbilt University, Scarritt College, and George Peabody College. In 1951, by 1974 the three branches, located in Nashville, Memphis and Knoxville, offered the two-year master's program. The doctoral program was inaugurated in 1983. In 1985 the B.S.S.W. program was added, and the School achieved college status.

The University of Tennessee College of Social Work is the only graduate professional social work education program in Tennessee and offers the full continuum of social work education degrees at the baccalaureate, master's and doctoral levels.

Social work is a helping profession which focuses on providing skilled intervention in the prevention and amelioration of individual and societal problems. It is the purpose of the College to provide an education which fosters growth in both individual and career development.

**GRADUATE PROGRAMS**

The two-year program (thesis or non-thesis option) leading to the Master of Science in Social Work is fully accredited by the Council on Social Work Education and is offered on all three campuses. The founda-
FIELDS OF INSTRUCTION
**THE MASTER OF ACCOUNTANCY PROGRAM**

The objective of the M.Acc. program is to provide persons who have a high level of ability and motivation with the depth and understanding of accounting that will enhance their probability of success in a career in professional accounting. Moreover, the student's educational experience should develop perspectives toward the discipline of accounting in a manner that will enable the student to spearhead innovation and change in response to needs in public accounting, industry, and government.

UT's accounting undergraduate and graduate programs are accredited by the American Assembly of Collegiate Schools of Business and are among the initial programs in the nation to receive this accreditation.

**Admission Requirements**

Application deadlines for international students are: Fall and Summer, January 15. Application deadlines for U.S. citizens and permanent residents are: Fall and Summer, March 1. The program is designed both for students who have completed an accredited baccalaureate degree program with a major in Accounting and others. Those with outstanding undergraduate records in areas other than accounting may earn the M.Acc degree by completing prerequisites in accounting and by including courses in other business and related disciplines to supplement the applicant's undergraduate background. Students entering the program should be computer literate and are expected to have completed coursework in calculus, principles of accounting, and introductory economics.

In addition to the general admission requirements for The Graduate School, M.Acc. applicants are required to take the Graduate Management Admission Test (GMAT) and submit information on forms provided by the College of Business Administration. Applicants for whom the native language is not English must submit results of the Test of English as a Foreign Language (TOEFL).

**Course Requirements**

A student's program encompasses a minimum of 30 semester hours of graduate coursework. Specifically, the student must complete courses in accounting and other areas as indicated below. Each course is 3 semester hours of graduate credit.

A student with an undergraduate degree in accounting can usually complete the program in about eleven months. A student without an undergraduate accounting degree can usually complete the program in about fifteen months.

For students with an undergraduate accounting degree, the requirements are:

- **Business Core (9 hours):** Business Administration 502-03; Business Law 511.
- **Accounting Core (6 hours):** 506-07.
- **Accounting Concentration (9 hours):**
  - **Financial/Auditing:** 415, 451, 514, 518, 519, 521.
  - **Systems:** 514, 521, 541, 542, 549.
  - **Taxation:** 531, 532, 533, 534, 539.

Students must take at least three courses from the same concentration and one of the course numbers must end with 9.

For students without an undergraduate Accounting degree, the requirements are:

- **Prerequisites:** 311, 341, 411, 414, and 431.
- **Business Core (12 hours):** Business Administration 502-03; Business Law 511; and a non-accounting business elective to be approved by advisor.
- **Accounting Core (9 hours):** 506-07, 519, 521.
- **Accounting Concentration (9 hours):**
  - **Financial/Auditing:** 415, 451, 514, 518, 519.
  - **Systems:** 514, 541, 542, 549.
  - **Taxation:** 531, 532, 533, 534, 539.

Students must take at least three courses from the same concentration and one of the course numbers must end with 9.
Accounting

**GRADUATE COURSES**

415 **Graduate and Nonprofit Accounting (3)**
- Advanced study of governmental and nonprofit entities: Governmental accounting principles, revenues and expenditures, budgeting, and financial reporting.
- Accounting principles and reporting models of nonprofit organizations. Integration of economic and social issues with reporting standards for governmental and nonprofit organizations. Prerequisite: Financial Accounting by Business and Nonprofit Organizations or consent of instructor.

451 **Operational Auditing and Consulting (3)**
- Approaches to evaluate an entity's efficiency and effectiveness in a variety of settings and techniques used in consulting to provide entity competitive advantage.

502 **Registration for Use of Facilities (3-15)**
- Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May be repeated. S/N only, E.

506-07 **Professional Accounting Practice I, II (3, 3)**
- Advanced financial reporting and auditing topics to meet complex financing needs of professions. Prerequisite: Admission to M.Acc. program.

514 **Information Systems Control and Auditing (3)**
- Relationships between design of internal controls, assessment of internal control effectiveness, and audit of internal controls in computerized environments. Current security and technology issues for both centralized and distributed computer environments. Prerequisite: Admission to M.Acc. program.

518 **Taxation of Business Entities (3)**
- Review and analysis of tax principles and law pertaining to business entities: corporations and partnerships. Tax planning strategies and techniques. Prerequisite: Admission to M.Acc. program.

519 **Seminar in Accounting and Auditing Policy (3)**

521 **Seminar in Advanced Managerial Cost Accounting (3)**
- Analysis of conceptual and current issues; impact on development and practice of managerial and cost accounting. Approaches to management accounting, decision and control models, and planning and control under conditions of uncertainty. Prerequisite: Cost and Managerial Accounting and admission to a graduate business program or consent of instructor.

531 **Tax Research and Strategy (3)**

532 **Corporate Taxation and Reorganizations (3)**
- Organization and structure, distributions, liquidations, reorganizations, and special problems in taxation of corporations and shareholders. Prerequisite: Admission to M.Acc. program or consent of instructor. Prerequisite or corequisite: 531.

533 **Taxes of Partnerships and S Corporations (3)**
- Formation, operation, termination, and other special problems of partnerships. Election for S Corporations, and comparison of partnerships and S-Corporations. Prerequisite: Admission to M.Acc. program or consent of instructor. Prerequisite or corequisite: 531.

534 **Family Tax Planning (3)**
- Review and analysis of laws pertaining to inter vivos and inter vivos post-mortem property transfers, and taxation of estates. Financial planning techniques and strategies used to accomplish family tax planning objectives. Prerequisite or corequisite: 531.

539 **Multi-Jurisdictional Tax Planning Policy (3)**
- Analysis of international, state and local tax law as it pertains to business transactions. Identification of taxation planning opportunities and design of strategies to accomplish tax planning objectives. Policy issues related to multiple jurisdictional taxation. Prerequisite: Federal Income Taxation and admission to M.Acc. program.

541 **Database Systems (3)**
- Design, implementation, and use of database systems for collection, organization, and distribution of economic information about organizations. Prerequisite: Accounting Information Systems and admission to a graduate program or consent of instructor.

542 **Systems Analysis and Design (3)**
- Analysis and design of information systems for management and distribution of economic information about organizations. Prerequisite: Accounting Information Systems and admission to a graduate program or consent of instructor.

549 **Systems Issues and Policies (3)**
- Seminar in emerging topics in management systems and knowledge-based systems. Prerequisite: Admission to a graduate program or consent of instructor. Prerequisite or corequisite: 542.

592 **Graduate Internship in Accounting (3)**
- Full-time resident professional employment for one academic semester involving qualified job experience, written report of responsibilities, and evaluation of student performance. Prerequisite: Admission to M.Acc. program or consent of M.Acc. advisor.

593 **Individual Research in Accounting (3)**
- Directed research in topic of mutual interest. Prerequisite: Admission to M.Acc. program or consent of M.Acc. advisor. May be repeated. Maximum 6 hours.

600 **Doctoral Research and Dissertation (3-15)**
- Directed research in topic of mutual interest. Prerequisite: Admission to M.Acc. program or consent of M.Acc. advisor. May be repeated. Maximum 6 hours.

611-12 **Doctoral Seminar in Accounting (3, 3)**
- Seminar in emerging topics in practice of accounting. Prerequisite: Consent of Ph.D. program advisor.

619 **Doctoral Research in Accounting (3)**
- Study of research methodology and application of various research methods in accounting literature. Prerequisite: Consent of Ph.D. program advisor.

621-22 **Accounting Colloquium (1, 1)**
- Research and discussion of contemporary issues in practice of accounting. Prerequisite: Consent of Ph.D. program advisor. May be repeated. S/N only.

**BUSINESS ADMINISTRATION CONCENTRATION**

For complete listing of Ph.D. program requirements, see Business Administration. Ph.D. Concentration: Accounting.

This degree provides a research-oriented terminal qualification for those seeking entry-level faculty positions in accounting.

Students take approximately three years of coursework beyond the bachelor's degree, including a doctoral sequence designed to expose students to various areas of accounting research. Courses in accounting and other areas are selected to supplement the student's individual background and to prepare the student in an area of accounting specialization (financial, managerial, auditing, tax, or systems). The final year is normally spent completing the doctoral dissertation.

Minimum course requirements are 12 hours including 611, 612, 619, and one other accounting course to be approved by Ph.D. accounting program advisor.

**ACADEMIC STANDARDS**

A graduate student in the College of Business Administration whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative graduate grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next semester's coursework as established by the degree program for full-time students and the next two semester's coursework as established by the degree program for part-time students.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.Acc. program in Accounting is available to residents of the state of West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records. About 500 students are enrolled in the program.

**DEGREES**

- M.Acc.
- Ph.D.
Aerospace Engineering

See Mechanical and Aerospace Engineering

Agricultural and Biosystems Engineering

(College of Agricultural Sciences and Natural Resources)

MAJORS DEGREES
Biosystems Engineering .......... M.S., Ph.D.
Biosystems Engineering Technology .... M.S.
Luther R. Wilhelm, Interim Head

Professors:
Bledsoe, B. L., PE, Ph.D. .......... Oklahoma State
Henry, Z. A. (Emeritus), PE, Ph.D. .... NC State
Luttrell, D. H. (Emeritus), Ph.D. ...... Iowa State
McDow, J. J. (Emeritus), PE, Ph.D. ...... Iowa State
Mote, C. R., PE, Ph.D. ........... Ohio State
Sewell, J. I. (Emeritus), PE, Ph.D. .... NC State
Shelton, C. H. (Emeritus), M.S. .......... VPI
Tomkins, F. D., PE, Ph.D. .......... Tennessee
Wilhelm, L. R., PE, Ph.D. .......... Tennessee
Wills, J. M., B.S. ............. Tennessee

Associate Professors:
Buschermohle, M. J., Ph.D. .......... Clemson
Freeland, R. S., PE, Ph.D. .......... Tennessee
Grandle, G. F., Ph.D. .......... Tennessee
Hart, W. E., Ph.D. .......... Purdue
Pordesimo, L. O., Ph.D. .......... Penn State
Raman, D. R., PE, Ph.D. ........... Cornell
Wilkinson, J. B., Ph.D. .......... Purdue
Womac, A. R., PE, Ph.D. .......... Tennessee
Yoder, D. C., Ph.D. .......... Purdue
Yoder, R. E. (Liielieon), PE, Ph.D. ...... Colorado State

Assistant Professors:
Burns, R. T., PE, Ph.D. .......... Tennessee
Hubbert, G. J., PE, Ph.D. .......... Illinois

Graduate programs leading to the Master of Science and Doctor of Philosophy with a major in Biosystems Engineering are available to graduates of a recognized curriculum in engineering, mathematics, or one of the physical or biological sciences. A graduate program leading to the Master of Science in Biosystems Engineering Technology is available to graduates of a recognized curriculum in agriculture or other related fields. These programs emphasize the application of engineering and engineering technology to agricultural and other biological systems. Major focus areas of the program are: engineering systems; environmental quality and resource conservation; instrumentation, sensor, and control systems; and bioprocessing. Prerequisite courses may be required depending upon the applicant's academic background and interest area within the program.

A completed departmental data sheet and three completed Graduate School Rating Forms are required in addition to the Graduate School application. International students must submit scores from the GRE general examination. Each applicant will be advised about any prerequisite courses before entering a graduate program. The student's program of study must be approved by the student's advisory committee and must comply with the requirements of The Graduate School.

A significant aspect of graduate education beyond formal courses and thesis projects is active participation in the professional community which exists within academic departments at universities. Student/faculty seminars are one of the professionally rewarding activities of the community. Accordingly, all graduate students are encouraged to participate in Biosystems Engineering 505 and other departmental seminars regardless of whether they are registered for seminar credit.

THE MASTER'S PROGRAMS

Biosystems Engineering

Applicants accepted into the program must complete at least 30 semester hours to earn a degree. Of these 30 hours, 20 must be in courses numbered 500 or greater (6 hours of thesis plus 14 hours of other courses). Other specific requirements for the 30 hours are:

- 597 Independent Study (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

Biosystems Engineering 504 (1) or 507 (1), 505 (1), and other major subject courses 12
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 6
Program electives 6
Thesis 500 6

In addition to completing the 30 semester hours, master's students must pass a final oral examination covering the thesis, related areas, and graduate coursework.

Biosystems Engineering Technology

Thesis Option: Applicants accepted into the program must complete at least 30 semester hours to earn a degree. Of these 30 hours, 20 must be in courses numbered 500 or greater (6 hours of thesis plus 14 hours of other courses). Other specific requirements for the 30 hours are:

Biosystems Engineering Technology 504 (1) or 507 (1), 505 (1), and other major subject courses 12
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 6
Program electives 6
Thesis 500 6

In addition to completing the 30 semester hours, master's students must pass a final oral examination covering the thesis, related areas, and graduate coursework.

Non-Thesis Option: A non-thesis option in Biosystems Engineering Technology is available to qualified students. Applicants accepted into the program must complete at least 33 semester hours to earn a degree. Of these 33 hours, 20 must be in courses numbered greater than 500. Other specific requirements for the 33 hours are:

Biosystems Engineering Technology 504 (1) or 507 (1), 505 (1), and other major subject courses 12
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 6
Program electives 6
Coursework in special emphasis area 3
Capstone Experience (project and report, typically 508) 3

In addition to completing the 33 semester hours, non-thesis students must pass a comprehensive written final examination covering the graduate program, including the capstone experience. At the discretion of the candidate's committee, an oral examination may also be required.
THE DOCTORAL PROGRAM

Departmental Requirements

Students applying for admission into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the faculty of the department. An approved master's thesis will usually be acceptable for this purpose.

To earn a degree, each doctoral student must complete at least 75 hours of approved graduate credit (beyond the baccalaureate degree) in Biosystems Engineering and supporting areas (engineering, computational methods, agricultural and biological sciences, and other related areas). Of the 75 hours, 48 must be in courses numbered greater than 500 (including 24 hours of course 600) and 6 hours of courses at UT numbered greater than 600. Other specific requirements for the minimum 75 hours are:

Major subject courses 18 hours
Coursework in computational methods, mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department 9 hours
Program electives 21 hours
Seminar (504, 505 or equivalent courses) 3 hours
Dissertation 24 hours

In addition to completing the minimum 75 hours of graduate credit required for a degree, each doctoral student must also pass a comprehensive examination as required by The Graduate School.

Biosystems Engineering

GRADUATE COURSES

403 Machine and Component Design (3) Nature of design; functional analysis; creatively and geometric and kinematic requirements; plane mechanics, forces, stress, deflection analysis. No design project components and assemblies. Prerequisite: Power Units and Machinery or consent of instructor. 1 hr and 2 labs. F

423 Irrigation and Waste Management System Design (3) Design of irrigation and agricultural waste management systems with consideration given to livestock waste characteristics, climate, water quantity, system characteristics, and impact on crop yield and water quality. Prerequisite: 315 Soil and Water Conservation, Engineering Science 341 Fluid Mechanics I, and Civil and Environmental Engineering 390 Hydraulics. 1 hr and 2 labs. F

430 Mobile Hydraulic Power System Design (3) Functional and operational characteristics of mobile hydraulic system components; pumps, valves and actuators; analysis and synthesis of power transmission and control circuits. Prerequisite: Fluid Mechanics or Hydraulics. 2 hrs and 1 lab. F

433 Bioprocess System Design and Analysis (3) Design of processing, storage and handling systems for biological materials. Mass and energy balances, product and waste characterization, equipment specifications, economic analysis, safety, and human factors. Design content: 3 hrs. Prerequisite: Processing I and Biological Materials. 1 hr and 2 labs. F

451 Electronic Systems (4) Basic electronics with biological applications. Analog and digital electronics; sensing and controlling physical and environmental parameters; sensor selection and interfacing; signal conditioning; process control. Laboratory experiments and design projects. Prerequisite: Circuits and Electrical Mechanical Components. 3 hrs and 1 lab. Sp

500 Thesis (1-15) P/N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E

504 Professional Development Seminar (1) Planning and executing professional development; ethics and professionalism; departmental procedures and resources. (Same as Biosystems Engineering Technology 504.) 2 hrs. F

505 Professional Communications Seminar (1) Reviews and reports of ideas, recent advances and current topics; presentations by students. Should be taken in last full semester before graduation. Prerequisite: 504. May be repeated in doctoral program. Maximum 2 hrs. (Same as Biosystems Engineering Technology 505.) S/N only. E

507 Professional Development Seminar (1) Same as Agriculture and Natural Resources 507, Animal Sciences 507, Environmental Sciences 507, Food Science and Technology 507, Ornamental Horticulture and Landscape Design 507, and Plant and Soil Sciences 507. S/N only. F

510D Instrumentation and Design (3) Dimensional analysis, governing theory of models; true, distorted, dissimilar models; prediction equations; interpretation of data; applications to machinery, soil and water stability, buildings and other agricultural engineering related problems. Prerequisite: Engineering Science 321, 321. 2 hr and 1 lab. F/A

525 Soil Erosion and Sediment Yield (3) (Same as Environmental Science 525.)

530 Research Problems in Biosystems Engineering (1-3) Theoretical and experimental studies relating to current problems in agricultural engineering. May be repeated. Maximum 6 hrs. E

541 Principles of Compost Engineering (3) Comprehensive study of composting: survey of installed systems; thermodynamics of composting; biology of composting; kinetics of heat accumulation; feed conditioning; aeration; substrate characteristics; process kinetics; and odor control. Design component. Prerequisite: Thermodynamics, heat and mass transfer. F

543 Instrumentation and Measurement (3) Modern instrumentation techniques. Static and dynamic response of instrumentation; signal conditioning; temperature, moisture, optical radiation, displacement, strain, pressure, velocity and acceleration; theoretical measurement; digital data acquisition and control. Prerequisite: 451 or Electronics and Computer Circuits or equivalent. 2 hrs and 1 lab. (Same as Environmental Engineering 543.) F/A

545 Monitoring Hydrologic Phenomena (3) Application of instrumentation theory to monitoring hydrologic phenomena; strengths and weaknesses of current equipment and strategies; equipment operation and solution of environmental monitoring problems. Prerequisite: 543 and knowledge of basic hydrology. 2 hrs and 1 lab. (Same as Environmental Engineering 545.) Sp/A

550 Selected Topics (1-3) Lecture/group discussion, and individual study on specialized developments. May be repeated. Maximum 6 hrs. E

555 GIS and GPS Applications to Biosystems (3) Theory and applications of Geographical Information Systems (GIS) and Global Positioning Systems (GPS); acquiring, managing, and analyzing spatially-varying data. Site-specific agriculture, environmental site assessment, natural resource management, and hydrology. Prerequisite: Graduation in bioresource science, environmental science, and/or physical sciences. (Same as Biosystems Engineering Technology 555.)

575 Applied Microbiology and Bioengineering (3) (Same as Chemical Engineering 575, Environmental Engineering 575, and Microbiology 575.)

600 Doctoral Research and Dissertation (3-15) P/N only. E

620 Computer Simulation of Agricultural Systems (3) Scientific approach to digital simulation; system definitions and boundaries, formulation of models, algorithms and solution techniques, encoding of prediction equations models, algorithms and solution techniques, encoding of prediction equations and model output; calibration and validation of model results. Prerequisite: Knowledge of computer programming language. 2 hrs and 1 lab. F/A

530 Feedback and Control Systems (3) Differential equations for physical systems: solutions, transforms, and system response. Types of control, frequency response, system compensation, and system analysis. Application to agricultural systems. Prerequisite: 451 and consent of instructor. 2 hrs and 1 lab. F

580 Selected Topics (1-3) Lecture, group discussion, and individual study on specialized developments. May be repeated. Maximum 6 hrs. E

Biosystems Engineering Technology

GRADUATE COURSES

422 Food and Process Engineering Technology (3) Application of basic engineering principles to agricultural and food processes. Fluid handling, drying, evaporation, heat and mass transfer, processing, heating and cooling, refrigeration systems, and material handling. Prerequisite: Basic physics. 2 hrs and 1 lab. F

432 Agricultural Machinery and Tractors (3) Functions, selection, matching, and management of agricultural machines as related to machines and systems. Prerequisite: Mathematics 232 Basic Calculus or 125 Finite Mathematics or consent of instructor. 2 hrs and 1 lab. Sp

442 Agricultural Waste Management and Pollution Control (3) Waste and odor control; application of basic engineering principles to animal waste characteristics; techniques for collection, transport, storage, and utilization of livestock waste. Prerequisite: Basic Calculus or Finite Mathematics or equivalent. 2 hrs and 1 lab. F

525 Small Internal Combustion Engines (3) Theory, concepts, and mechanics of small internal combustion engines; theoretical cycles; selection, operation, adjustment, troubleshooting and repair of single-cylinder engines. Prerequisite: Basic calculus or finite mathematics or equivalent or consent of instructor. 2 hrs and 1 lab. Sp

452 Agricultural Chemical Application Technology (3) Equipment for application of liquid, solid, and gaseous agricultural chemicals; crop management; safety considerations; applications and handling devices. Prerequisite: Basic calculus or finite mathematics or equivalent or consent of instructor. 2 hrs and 1 lab. Sp

454 Mechanical Design of Agricultural Equipment (3) Equipment for application of liquid, solid, and gaseous agricultural chemicals; crop management; safety considerations; applications and handling devices. Prerequisite: Basic calculus or finite mathematics or equivalent or consent of instructor. 2 hrs and 1 lab. Sp

500 Thesis (1-15) P/N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E

504 Professional Development Seminar (1) (Same as Biosystems Engineering 504) S/N only. E

505 Professional Communications Seminar (1) (Same as Biosystems Engineering 505) S/N only. E

580 Selected Topics (1-3) Lecture, group discussion, and individual study on specialized developments. May be repeated. Maximum 6 hrs. E

560 Physical Phenomena (3) Properties of materials, fundamentals of hydraulics, principles of electricity, thermal phenomena, applications in biological syste-
Agricultural and Extension Education

(College of Agricultural Sciences and Natural Resources)

MAJOR
Agricultural and Extension Education M.S.

Roy R. Lessly, Head

Professors:
Dickson, Lewis H. (Emeritus), Ed.D. ............ Oklahoma State
Lessly, Roy R. (Liaison), Ed.D. ............................ Oklahoma State
Tod, John D. (Emeritus), Ed.D. ............................ Illinois

Associate Professor:
Waters, Randol G., Ph.D. ............................... Penn State

Assistant Professor:
Delnero, Jennifer A., Ph.D. ............................. Oklahoma State

The Department of Agricultural and Extension Education offers a program leading to the Master of Science degree with a major in Agricultural and Extension Education. The program is designed primarily for teachers of Agricultural Education and staff employed by the Agricultural Extension Service. However, due to the flexibility of the program, it would be of value to any student interested in agriculture or related continuing education. The program may be completed under a thesis or non-thesis option with a concentration in either agricultural education or agricultural extension education. Candidates for the master’s degree must meet the general requirements of The Graduate School and those stipulated by the department.

THE MASTER’S PROGRAM

Thesis Option
A candidate for the master’s degree who elects the thesis option must successfully complete:
1. A minimum of 30 hours of graduate credit in courses approved by the student’s advisory committee. Six hours of thesis may be counted toward this requirement.
2. A minimum of 20 hours of graduate credit in courses numbered at or above the 500 level.
3. A minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department.
4. A minimum of 3 hours of graduate credit in coursework in either research methodology or statistics.
5. A final oral examination.

Non-Thesis Option
A candidate for the master’s degree who elects the non-thesis option must successfully complete:
1. A minimum of 36 hours of graduate credit in courses approved by the student’s advisory committee.
2. A minimum of 24 hours of graduate credit in courses numbered at or above the 500 level.
3. A minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department.
4. A minimum of 3 hours of graduate credit in coursework in either research methodology or statistics.
5. A creative component designed by the student and approved by the student’s advisory committee for 3 hours of graduate credit.
6. A written and oral comprehensive examination.

GRADUATE COURSES

411 Fundamentals of Agricultural Extension (3) History, philosophy, organizational structure, clientele served, major areas of program emphasis, teaching methods, and relationships with other educational agencies. Graduate credit for non-majors only. Sp

500 Thesis (1-15) F/P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

521 Extension Program Planning (2) Methods of developing county extension programs: sources of essential basic information, determination of problems and needs of people, functions of lay people and various groups of extension workers. Use of committees, step-by-step planning procedures, coordinated county and state plans and characteristics of effective programs. Prereq: 411 or consent of instructor. Sp

522 Extension Teaching Methods (2) Teaching learning methods and techniques applicable to extension work. Interrelationships and relative effectiveness. Result demonstrations, method demonstrations, meetings, tours, audio-visual aids. Prereq: 411 or consent of instructor. Sp

523 Extension Program Evaluation (2) Principles, instruments and techniques of identifying, gathering, analyzing, and using data to appraise planning and teaching the results of programs. Prereq: 411, 521, or consent of instructor. Sp

524 Research Methodology (3) Social research design, hypothesis testing, sampling, survey construction, scaling, interviewing, data coding, descriptive and/or statistical analysis, and presentation of results. Prereq: 436, 523, or consent of instructor.

525 Curriculum Planning in Agricultural Education (3) Models, principles and procedures for developing curricula in agricultural education and scheduling learning activities for planned instructional programs. Prereq: 435, 436 or consent of instructor.

526 Agricultural Education for First-Year Teachers (2) Developing competencies needed by first-year teachers organizing, conducting and evaluating programs in agricultural education in local communities. Group meetings in selected centers and visits by instructor. Prereq: 435, 436. Sp

527 Adult Education and Strategies for Teaching (3) Psychological, philosophical and sociological theories for adult education. Methods and strategies for organizing classes and teaching adults. Prereq: 411 or 436 or consent of instructor.

528 Advanced Techniques for Teaching Agricultural Mechanics and Methods (3) Techniques, strategies, learning methods and evaluation of teaching needed competencies, organizing and managing agricultural mechanics facilities. Prereq: 435, 436 or consent of instructor.

529 Selected Occupational Experiences in Agricultural Education (3) Historical and philosophical foundations of adult education in agriculture; methods and strategies for teaching agricultural occupations. Prereq: 435, 436 or consent of instructor.

530 Special Topics in Agricultural and Extension Education (1-3) Current issues. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

531 Extension History, Philosophy and Objectives (3) History, philosophy, organizational structure, clientele served, major areas of program emphasis, teaching methods, and relationships with other educational agencies. Graduate credit for non-majors only. Sp

532 Managing Extension Organizations, Programs and Personnel (3) Theory and principles of management for individuals and organizational effectiveness. Prereq: 521, 531, or consent of instructor. Sp

593 Special Problems in Agricultural and Extension Education (1-4) Special research and special papers based on supervised independent study. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
Agribusiness

The agribusiness concentration is designed to prepare students to succeed in the private or public sectors of agriculture, including product manufacturing and marketing, natural resource management, and financial analysis. Fifteen hours of agricultural economics, 3 hours of economic theory, 6 hours of quantitative methods, 6 hours of business, statistics, or communications electives and 6 hours of internship are required. Each student must pass both written and oral comprehensive examinations.

Rural Sociology

The rural sociology concentration is designed to prepare students for careers in the social sciences related to rural areas. Nine hours of rural sociology in the department, 6 hours of sociological theory, 3 hours of research methods, 3 hours of statistics, and 6 hours of thesis are required. Each student must pass a final oral examination.

MINOR

A minor will include 6 hours of coursework in the department, with at least 3 hours in 500-level courses. The student's committee must include a member of the faculty who will be responsible for designing courses required for the minor.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

Agricultural Economics

GRADUATE COURSES

412 Agricultural Finance (3) Macro-finance, financial objectives, acquisition of debt and equity funds, capital investments, capital allocation, credit analysis, borrower and lender loan application analysis, insurance strategies, computer applications, and sources of agricultural credit, and financial intermediation. Prereq: Intermediate Agriculture Economics. F

420 International Agricultural Trade and Marketing (3) Real and monetary aspects of international trade and effect on agricultural commodity flows; partial equilibrium analysis of international trade in agricultural products; institutional aspects of international marketing of agricultural products. Prereq: Intermediate Agricultural Economics or consent of instructor. F

430 Agricultural Policy (3) Values, goals and policy process, Economic rationale and effects of policy. Historical development, and current characteristics of commodity, credit, food, and trade policy. Prereq: Intermediate Agricultural Economics or consent of instructor. Sp

442 Agribusiness Management (3) Applications of advanced decision analysis concepts and tools to analyze management decision problems in farm and nonfarm agribusiness settings. Case study work on strategic planning, assessing costs, structures using budgeting and breakeven analysis, evaluating profitability, liquidity, and solvency using financial statements; analyzing investments using capital budgeting. Prereq: Farm Business Management or consent of instructor. F

450 Agricultural Industry Analysis and Forecasting (3) Analytical tools for decision making in agricultural sector, analysis of commodity supply and demand conditions; economic modeling; market forecasting, analysis of temporal and spatial patterns. Prereq: Agricultural Microeconomics and Introduction to Statistics or consent of instructor. F

470 Natural Resource Economics (3) Nature of natural resources, economic efficiency as basis for natural resource use; externalities in natural resource use; factors influencing environmental quality; alternative economic policy tools for influencing natural resource use or improving environmental quality. Prereq: Introductory Economics. Sp

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or spends time before or after classes. May be repeated. SNC only. E

505 Microeconomic Analysis (3) Theory of utility maximization and demand, production, cost, firm behavior, and supply; price in product and factor markets; efficiency and welfare. Prereq: Calculus and Intermediate Microeconomics or equivalent. F

524 Econometric Methods in Agricultural Economics (3) Application of statistical methodologies to agricultural economic models: estimation of supply, demand and production functions; microeconomic forecasting models; interpretation of results. Prereq: Regression and Correlation Methods or consent of instructor. F

525 Agribusiness Operations Research Methods (3) Applications of operations research methods and concepts for agribusiness. Theoretical background and applications are included. Prereq: Econometrics or equivalent. F

530 Agricultural Policy Analysis (3) Evaluation of public policy as related to agricultural industry and rural areas. Prereq: 505 and Economics 513 or consent of instructor. F

542 Advanced Agribusiness Production Decisions (3) Theoretical and empirical concepts in agricultural resource allocation; evaluation of both static and dynamic issues; decision theory with application to agricultural firms; aggregate impact of firm decisions on industry. Prereq: 505 or equivalent. Sp

550 Advanced Agribusiness Marketing (3) Use of economic concepts in agribusiness marketing decisions. Analysis of agricultural-markets; buyer behavior; and nonfarm agribusiness settings. Profitability analysis and distribution decisions; market planning and strategy; product evaluation and new product introduction; pricing decisions. Prereq: 505. Regression and Correlation Methods or equivalent. Sp

570 Advanced Natural Resource Economics (3) Analysis of natural resource allocation issues; demand and welfare economics, external effects and evaluation of public policy. Prereq: 470 and Economics 511 or consent of instructor. F

593 Special Topics in Agricultural Economics (1-3) Topics to be assigned. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

595 Professional Internship (6) Supervised internship with experience appropriate agribusiness firm.

Rural Sociology

GRADUATE COURSES

480 Technological and Community Change (3) Analysis of communication processes whereby new technology spreads within a farm population and analysis of social institutions related to change in rural communities. Prereq: Rural Sociology or consent of instructor. (Same as Sociology 480) Sp

580 Advanced Rural Sociology (3) Application of sociological concepts and theory to analyze changing social and economic life in rural areas and developing countries. Demographic changes, rural social and community indicators, and rural development in agricultural communities.
Agriculture and Natural Resources

(College of Agricultural Sciences and Natural Resources)

GRADUATE COURSES

507 Professional Development Seminar (1) Planning and executing graduate research programs; ethics and professionalism; graduate program procedures and resources. (Same as Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Food Science and Technology 507, Ornamental Horticulture and Landscape Design 507, and Plant and Soil Sciences in 507.) SNC only. F

509 Scientific Communication (1) Application of speaking, writing, and organizational skills in preparing research proposals, slide presentations, abstracts, web sites, and write. (Same as Animal Science 509, Food Science and Technology 509, Ornamental Horticulture and Landscape Design 509, and Plant and Soil Sciences 509.) F

512 Teaching Internship in Agriculture (1) Supervised experience in teaching; test preparation and evaluation of agriculture students. May be repeated. Maximum 2 hrs for M.S. students; 4 hrs for Ph.D. students.

Animal Science

(College of Agricultural Sciences and Natural Resources and College of Veterinary Medicine)

MAJOR

Animal Science .................................. M.S., Ph.D.
Veterinary Medicine ............................. D.V.M.

Professors:

Barth, K. M. (Emeritus), Ph.D. .......... Rutgers
Bell, M. C. (Emeritus), Ph.D. ............ Oklahoma State
Blethner, J. K. (Emeritus), Ph.D. ........ Ohio State
Chamberlain, C. C. (Emeritus), Ph.D. .... Michigan State
Eikle, H. D. M., Ph.D. ................. Georgia
Erickson, B. H. (Emeritus), Ph.D. .......... Kansas State
Godkin, J. D. (Liaison), Ph.D. .......... Massachusetts Hall, O. G. (Emeritus), Ph.D. ........ Iowa State
Henry, R. W., D.V.M., Ph.D. .......... Iowa State
Hovell, E. R. (Emeritus), M.S. .......... Tennessee
Masincup, F. B., Ph.D. ................. Kansas State
McDonald, T. P. (Emeritus), Ph.D. .......... Tennessee
McLaren, J. B. (Emeritus), Ph.D. .......... Auburn
Miller, J. K., Ph.D. ....................... Auburn
Murphee, R. L. (Emeritus), Ph.D. .......... Wisconsin
Oliver, S. P., Ph.D. ....................... Ohio State
Richardson, D. O., Ph.D. .................. Ohio State
Robbins, K. R., Ph.D. ..................... Illinois
Saxton, A., Ph.D. ......................... Ohio State
Schultz, T. W., Ph.D. ...................... Tennessee
Simms, M. H., Ph.D. ...................... Auburn
Tugwell, R. L. (Emeritus), Ph.D. .......... Kansas State

Associate Professors:

Backus, W. R., Ph.D. ................. Tennessee
Bell, B. R., Ph.D. .................. NC State
Blazier, H. M., Ph.D. ................ Florida
Heitmann, R. N., Ph.D. ............. Maine
Kattesh, H. G., Ph.D. ................ VPI
Mathew, A. G., Ph.D. ................ Purdue
Mendis-Handagama, L. C., Ph.D. .......... Nebraska
Schick, F. N., Ph.D. .................... Monash
Smith, M. O., Ph.D. ............... Oklahoma State
Wallace, J. C., Ph.D. ................ Minnesota

Assistant Professors:

Edwards, J. L., Ph.D. ................. Florida
Read, R. B., D.V.M., Ph.D. .......... Texas A&M
Tilhoff, P. K., D.V.M., Ph.D. .......... Michigan State

Science, who will act as chairperson of the committee, and a minimum of two other faculty members, one of whom may be outside of the Animal Science Department. The advisory committee approves the student's coursework and research problem and conducts the final oral examination which consists of a comprehensive oral examination and a defense of the thesis.

THE DOCTORAL PROGRAM

The doctoral program requires a minimum of 48 semester hours of coursework beyond the B.S. and a minimum of 24 hours of doctoral research and dissertation. The 48 hours of coursework must include:

1. A minimum of 16 hours in related fields outside of animal science.
2. At least 24 hours credit at the 500 and 600 level, exclusive of doctoral research and dissertation, of which a minimum of 6 hours must be at the 600 level. Students in the nutrition, breeding, physiology, or anatomy concentration must complete at least 12 hours at the 500 and 600 level in the respective concentration or closely related area. Students in the management concentration must complete 12 hours at the 500 of 600 level in two non-management concentrations.
3. A minimum of 1 hour of Agriculture 512 in addition to that required at the M.S. level.
4. A minimum of 6 hours in 400-, 500-, or 600-level statistics courses approved for the ICGSP. A minimum of five faculty members will constitute the student's advisory committee, of which at least one must be outside Animal Science. The major professor will be the chairperson. The student and the major professor select a program of study depending on the student's area of concentration and professional goal. The advisory committee approves the coursework and the dissertation research proposal and determines if there is to be a foreign language requirement. The advisory committee conducts the comprehensive written and oral examination and the final dissertation defense examination.

GRADUATE COURSES

420 Advanced Reproduction (3) Collection, evaluation, and preservation of ova, spermatozoa and embryos; application of methods of natural breeding and techniques of artificial insemination and embryo transfer; herd sire and dam evaluation; pregnancy determination; gestation and parturition; infertility; recent advances in therapeutic. Prereq: 320 or equivalent. 1 hr and 2 labs. F

430 Advanced Ration Formulation (2) Advanced ration formulation for beef and dairy cattle, sheep, hogs, swine, poultry, laboratory, zoo, and companion animals. Mathematical and computer solutions and applications to formulating complex rations with constraints. Prereq: 330 or equivalent and introductory computer science course, 2 labs. Sp

440 Advanced Animal Breeding (3) Computer simulation of genetic improvement for multiple traits in swine, beef, and dairy cattle; evaluation of alternative breeding strategies and industrial programs in swine, poultry, sheep, beef, and dairy cattle; breed development, improvement, and utilization. Prereq: 340 or equivalent, 1 hr and 1 lab. Sp

481 Beef Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, produc-
tion practices, and improvement programs. Management evaluated in terms of production responses and economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. Sp F

482 Dairy Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishments, systems of production, production practices, and improvement programs. Management evaluated in terms of production responses and economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. Sp F

483 Pork Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishments, systems of production, production practices, and improvement programs. Management evaluated in terms of production responses and economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. Sp F

484 Poultry Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishments, systems of production, production practices, and improvement programs. Management evaluated in terms of production responses and economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. Sp F

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Food Science and Technology 507, Ornamental Horticulture and Landscape Design 507, and Plant and Soil Sciences 507.) S/NC only. F

509 Scientific Communication (1) (Same as Agriculture and Natural Resources 509, Food Science and Technology 509, Ornamental Horticulture and Landscape Design 509, and Plant and Soil Sciences 509.) F

511 Special Problems in Animal Science (1-4) Prereq: Consent of instructor and department head. May be repeated with permission. S/NC only. E

520 Animal Physiology (4) Major body systems and interrelationships: nervous, muscle, blood, cardiovascular, kidney, respiratory, gastrointestinal, and endocrine. Concepts of metabolism, temperature regulation, and acid-base balance. Prereq: General undergraduate anatomy and physiology, and biochemistry, or consent of instructor. F-A

523 Advanced Mammalian Reproduction (3) Current topics and "new frontiers" in reproductive biology. Prereq: 322. Sp, A

530 Animal Nutrition and Metabolism (4) Comparative digestive physiology, digestion, absorption and metabolism of nutrients in ruminant and nonruminant species. Concepts and methodologies of animal nutrition. Prereq: Consent of instructor. F-A

535 Ruminology (2) Anatomy, physiology, and microbiology of rumen ecosystem: microbial fermentation and metabolism of polysaccharides, lipids and nitrogen. Prereq: 320 and consent of instructor. F

551 Mammalian Organology (3) Microscopic study of structure of organs and major organ systems. Prereq: Embryology, histology and/or consent of instructor. 2 hrs and 1 lab. Same as Comparative and Experimental Medicine—Veterinary Medicine 551. Sp

552 Anatomy of Domestic Carnivores (4) Gross dissection by systems and regions of dog with comparison to cat. Prereq: Consent of instructor. 1 hr and 3 labs. Same as Comparative and Experimental Medicine—Veterinary Medicine 552. F

571 Design and Analysis of Biological Research (3) Experimental design and procedures; selection of experimental units; analysis and interpretation of data; statistical models and contrasts, analyses of variance: covariates, treatment arrangements, mean separation and regression. Prereq: Plant and Soil Science 471 or equivalent; knowledge of software package on micro- or mainframe computer. (Same as Plant and Soil Science 571.) Sp

572 Least Squares Analysis (3) Least squares estimation and hypothesis testing procedures for linear models; mixed model methodology; full rank and nonfull rank situations; covariance structures: estimation of variance components. Prereq: 571 or equivalent. 2 hrs and 1 lab. F

586 Seminar (1) Advanced topics in animal science. Required of all first- and second-year graduate students. Letter grade available only to those who make presentation. May be repeated. Maximum 4 hrs. S/NC or letter grade. F-Sp

600 Doctoral Research and Dissertation (3-15) P/ NP only. E

621 Advanced Topics in Animal Physiology (1-4) Recent advances and concepts, research techniques and current problems. May be repeated. Maximum 6 hrs. E

631 Advanced Topics in Animal Nutrition (1-4) Recent advances and concepts, research techniques and current problems. May be repeated. Maximum 8 hrs. E

632 Advanced Mineral-Vitamin Nutrition (4) Chemical forms, digestion, absorption, intermediary metabolism, deficiencies, excesses and interactions of minerals and vitamins. Prereq: 530 or 531, and Biochemistry and Molecular Biology 460 or Nutrition 511 or consent of instructor. Sp, A

651 Advanced Topics in Animal Anatomy (1-4) Current and future research methodology, laboratory situation, recent advances in quantitative techniques for gross and microscopic anatomy. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. (Same as Comparative and Experimental Medicine—Veterinary Medicine 651.) E

652 Disorders of the Endocrine System (2) Pathological and physiological aspects of diseases: endocrine glands of various animal species. Prereq: 521 or consent of instructor. (Same as Comparative and Experimental Medicine—Veterinary Medicine 652.) Sp, A

Animal Science- Veterinary Medicine
See College of Veterinary Medicine and Comparative and Experimental Medicine

Anthropology
(College of Arts and Sciences)

MAJOR DEGREES
Anthropology.........................................M.A., Ph.D.

Jan F. Simek, Head

Professors:
Bass, William M. (Emeritus).
Ph.D. .................................. Pennsylvania State University
Faulkner, Charles H., Ph.D. .................................. Indiana University
Harrison, Faye V., Ph.D. .................................. Stanford University
Jantz, Richard L., Ph.D. .................................. Kansas State University
Klippel, Walter E., Ph.D. .................................. Missouri State University
Logan, Michael H., Ph.D. .................................. Penn State University
Parmelee, Paul W. (Emeritus), Ph.D. .................................. Texas A&M University
Schoenfeld, Gerald F., Ph.D. .................................. Washington State University
Simik, Jan F., Ph.D. .................................. SUNY Binghamton
Wheeler, Margaret C. (Emeritus), Ph.D. .................................. Yale University

Associate Professors:
Howell, Benita J., Ph.D. .................................. Kentucky State University
Königsegg, Lyle, Ph.D. .................................. Northwestern University
Kramer, Andrew (Liaison), Ph.D. .................................. Michigan State University
Marks, Murray K., Ph.D. .................................. Tennessee State University

Assistant Professor:
Ferreira, Mariana, Ph.D. .................................. California (Berkeley)

Research Associate Professor:
Chapman, J., Ph.D. .................................. North Carolina State University

Research Assistant Professors:
Elam, J. Michael, Ph.D. .................................. Missouri State University
Frankenberg, S. (Curator), Ph.D. .................................. Northwestern University

The Department of Anthropology offers both the M.A. and Ph.D. degrees with concentrations in archaeology, biological anthropology, cultural anthropology, and zooarchaeology. Additional information on the Anthropology graduate program may be obtained from the departmental office or by contacting the Anthropology Department.

THE MASTER'S PROGRAM

Students wishing to enter the Master of Arts degree program with a major in Anthropology should have an undergraduate GPA of 3.5 in the major, 3.3 overall, and hold a bachelor's degree from an accredited university with a major in Anthropology. Applicants with a major in a related field (biology, sociology, geology, classics or geography) will be considered only if they have a formal minor in anthropology or its equivalent (at least five upper division anthropology courses).

All prospective M.A. students must make a formal application to The University of Tennessee, Department of Anthropology, 2101 Cumberland Avenue, Knoxville, TN 37996-0720. Graduate applications are considered once a year by the Graduate Committee. All application materials must be received in the department by January 15 for admission the following Fall. Because of the structure of first-year studies, M.A. students should plan to begin their studies in the Fall semester.
M.A. Requirements

The program leading to the M.A. is a general curriculum that allows for concentration after completion of a core course sequence. Formal requirements include:

1. Selection of an M.A. advisor. This should be done as soon as possible in the student's program but must be done no later than the end of the first semester in residence. The department graduate secretary must be informed in writing of each student's advisor.

2. A minimum of 50 credit hours in graduate courses. Twenty-four hours must be in coursework graded A-F. Coursework must include three core classes taken in the first year:
   a. 510 Method and Theory in Cultural Anthropology
   b. 560 Theory in Archaeology
   c. 590 Theory and Methodology in Biological Anthropology

Additional coursework should be selected in consultation with the student's advisor and must include one additional course from two anthropology concentrations besides the student's primary concentration. At least 20 hours of coursework must be at the 500 level or higher.

3. During the first year, comprehensive Graduate Evaluation Examinations (GEEs) are required of all M.A. students and are based on the content of the core courses. These examinations are given during regularly-scheduled final periods in each core class and are graded by all faculty within the appropriate subdiscipline for each course. At the end of the first year, all M.A. students will be evaluated by the entire faculty and will either be retained or dropped from the program based on their first year's performance and GEE scores.

4. All M.A. students must attend the graduate section of the visiting lecturer program. To insure compliance with this requirement, each student is required to register for one credit hour of Anthropology 550 in the fall semester of each year and fulfill all requirements for the course as defined by the instructor. Materials covered by visiting lecturers may appear on the GEE.

5. A grade of B or better is required.

6. In the second year of the program, students pursue their concentration area and undertake thesis research. Coursework will be determined through consultation with the student's advisor and committee (composed of the advisor and at least one other member of the Anthropology faculty along with other mutually-agreed upon members).

7. Successful completion of the thesis and final oral examination. Normally, students will complete and defend their theses during the Spring semester of their second year.

8. Two copies of the thesis are required by The Graduate School. In addition, bound copies of the thesis are to be provided to the department and to all members of the student's M.A. committee.

In addition to the requirements listed above, M.A. students have the option of completing a minor in statistics. The statistics minor requires 9 hours of coursework, normally Statistics 537 and 538 plus one additional course from an approved list.

THE DOCTORAL PROGRAM

In addition to The Graduate School requirements, requirements for the Ph.D. degree in Anthropology, in the appropriate sequence of completion, are as follows:

Admission: Admission to the Ph.D. program is contingent upon completion of ALL requirements prior to that level. Master's thesis candidates at UT who are conditionally accepted into the Ph.D. program can enroll as doctoral students the semester following conferment of the M.A. degree. Students holding Master's degrees from other institutions must apply by January 15 for admission following the Fall and must begin their studies in the Fall semester.

Admission to the Ph.D. program is based upon the applicant's academic record and credentials, but also on fit between an individual's interest and faculty areas of research. Applicants will not be admitted to the Ph.D. program unless appropriate faculty members are available to chair and serve on the doctoral committee. Doctoral program applicants should coordinate directly with the potential chairperson and two additional members of the anthropology faculty who will be asked to serve on the committee.

Admission to the Ph.D. degree program should meet the same academic standards as M.A. program applicants and furnish the same materials (see The Master's Program). Admission to the program requires either:

1. Acceptance of a Master's degree in anthropology; or
2. Acceptance of a Master's degree in another discipline, with the provision that the student will follow the first-year program with entering M.A. students, i.e., complete the core courses (510, 550, 590) and pass the Graduate Evaluation Examinations.

Doctoral Committee: A doctoral committee is appointed following admission to the program. In consultation with this committee, the student defines the future program of studies. When the student and committee have agreed upon the specific fields of specialized competence over which the student will be examined, a brief delineation is entered into the student's file. A grade of B or better is required.

Residence and Coursework: Every potential Ph.D. candidate must complete two consecutive semesters of full-time residence prior to taking the comprehensive written examination. The student must complete the minimum coursework requirements of The Graduate School, including at least nine hours of 500- or 600-level courses outside of anthropology, chosen in consultation with the doctoral committee, particularly the outside member who represents the cognate area. Outlines must be taken in a single discipline or be distributed across two or more disciplines as appropriate to the individual's program of study.

Statistics: Demonstration of competence in statistics by completing Statistics 537 and 538 with a grade of B or better is required.

Language: Students must demonstrate knowledge of one foreign language. This language should normally be French, German, Russian or Spanish, but another language may be substituted at the committee's discretion. This requirement may be met by either:

1. Successful performance on a language examination administered by the appropriate language department. A student electing this alternative should consult with the advisor; or
2. Completion of the second semester of specialized reading courses for graduate students with a grade of B or better.

The department does not accept completion of the intermediate (200 level) sequence of a language as a formal option for fulfilling the language requirement.

Doctoral Comprehensive Examination: Students must successfully complete a written and oral comprehensive exam.

1. Comprehensive Written Examination: When the Ph.D. aspirant has completed all of the following requirements and is judged by the committee to be prepared for the first (or only) field of concentration, the student will be required to take a comprehensive written examination. The exam will consist of three sections and be given by the student's committee. All three sections must be taken within seven consecutive days.

2. Comprehensive Oral Examination: This examination will be held. The committee will consist of three members and will be taken within seven consecutive days.

Dissertation Research: This period of research and writing will be under the direct guidance of the candidate's major professor. The major professor will act as chairperson of the candidate's committee. The candidate must earn a minimum of 24 hours in Anthropology 600 and maintain continuous registration until the dissertation is accepted. The option of presenting publishable papers as a dissertation is not an formal option for the Anthropology Department.

Defense of Dissertation Examination: When the dissertation has been tentatively accepted by the committee, a final oral examination will be held. The committee conducts the exam, which is ordinarily held as a colloquium in which the candidate will expound on the nature and significance of his/her contribution to anthropological knowledge as set forth in the dissertation.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis.

The M.A. program in Anthropology is available to residents of the states of Louisiana, Virginia, or West Virginia. The Ph.D. program is available to residents of Alabama, Delaware, Louisiana, Mississippi, South Carolina, or West Virginia. Additional information on the Academic Common Market is available from the Graduate School.
401 Principles of Cultural Anthropology (3) Exploration and illustration of major concepts, theories, and methods in cultural anthropology, with application to analysis of specific ethnographies. Prereq: 130.

411 Linguistic Anthropology (3) Basic linguistic concepts applied to research in cultural anthropology; investigation of relationships between language and culture. Prereq: 130 or Linguistics 200. (Same as Linguistics 411.)

412 Folklore in Anthropology (3) Introduction to anthropological study of folklore, using folklore and folktale materials from various tribal, peasant, and complex societies. Prereq: 130 or consent of instructor.

413 Dynamics of Culture (3) Major forms of culture change, ranging from evolution and diffusion to religious revitalization and political revolt. Continuity and change in diverse cultural settings through use of archaeological, ethnohistoric, and contemporary cases. Prereq: 130.

414 Political Anthropology (3) Organization and dynamics of power and politics in both stateless and state-level societies. Role of symbols, rituals, and ideologies in producing and reproducing power relations. Relationship between political systems (individuals and structures. Encapsulation of traditional political forms and systems within modern states. Prereq: Cultural Anthropology or consent of instructor.

431 Ethnographic Research (3) Conceptual and practical exploration of methods and techniques cultural anthropologists use in fieldwork. Prereq: Cultural Anthropology or consent of instructor.

435 Historical Archaeology Laboratory (3) Laboratory procedures in processing, identification, and interpretation of artifacts from prehistoric and historic sites. Artifactual material from historic East Tennessee sites used for class projects. Recommended prereq: Historic Archaeology.

440 Cultural Ecology (3) Concepts and methods in studying dynamic interaction between prehistoric and present cultures and their environments: ecological, ethnographic, and ecological. Prereq: 120, 130, 140, or consent of instructor.

462 Early European Prehistory (3) Origins and evolution of human culture in Europe through beginnings of settled life. Paleolithic and Mesolithic chronology and lifeways. Prereq: 120 or consent of instructor.

463 Rise of Complex Civilizations (3) Development of complex societies in Old World from origins of agricultural economies to rise of states. Neolithic, Mesoamerican, and Metal Age lifeways in Africa, Europe, and Asia. Prereq: 120 or consent of instructor.

464 Principles of Zooarchaeology (3) Basic osteological studies of major vertebrate groups: aboriginal use of animals in subsistence and culture. Identification and interpretation of archaeologically derived molluscan and vertebrate remains; introduction to laboratory use of comparative collections. Prereq: 120 or consent of instructor.

465 Urban Archaeology (3) Field archaeology and interpretation of archaeological remains on historic urban sites in U.S. Lectures and field and laboratory research on urban sites in East Tennessee. Recommended prereq: Historic Archaeology.

480 Human Osteology (4) Intensive examination of human skeletal remains. Prereq: 110 and consent of instructor. 3 hrs and 1 lab.

481 Museology I: Museums, Purpose and Function (3) (Same as Art 481.)

482 Museology II: Exhibition Planning and Installation (3) (Same as Art 482.)

484 Museology III: Field Projects (1-12) (Same as Art 484.)


486 Palaeoecology (3) Living and fossil primate monkeys, ecology, and comparative anatomy. Survey of primate fossil record; origin of major primate lineages. Prereq: 110 or consent of instructor.

487 Primate Behavior (3) Social organization and behavior of selected primates; group composition, size, and structure; patterns of mating; other social interactions; communication, and cultural behavior. Application of primate studies to human ethology. Prereq: 110 or consent of instructor.

500 Thesis (1-15) Pr/NP only. E

501 Graduate Research (1-9) Independent investigation of special problems in archaeology. May be repeated. Maximum 18 hrs.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. E

510 Method and Theory in Cultural Anthropology (3) Development of primary theoretical orientations by cultural anthropologists: formulation of research problems and methods of collecting, organizing, and utilizing data. Prereq: Consent of instructor.

511 Special Topics in Cultural Anthropology (3) Seminars for advanced students on special interests: ethnopharmacology, psychological anthropology, comparative social organization, religion, and art. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

512 Urban Studies in Anthropology (3) Process of urbanization examined cross-culturally; theory and method in researching urban communities; urban problems and applied anthropological research. Prereq: Consent of instructor.

513 Rural Studies in Anthropology (3) Theory, method, and ethnographic research on selected problems and aspects of traditional agrarian groups in the U.S. and peasant societies. Prereq: Cultural area course or equivalent. May be repeated. Maximum 8 hrs.

514 Anthropology of Development (3) Application of anthropological theory, methods, and findings to community and national development programs. Analysis of anthropological research design, and ethical issues in selected case studies. Survey of anthropologists' work in non-academic settings.

515 Medical Anthropology (3) Cultural impact on disease patterning, theories of disease causation, and models of therapy. Theoretical and applied aspects of the anthropological study of health and disease. Prereq: Consent of instructor.

517 Forms of Social Inequality (3) Anthropological perspectives on societies stratified along lines of rank, caste, race, ethnicity, and class; inequalities engendered by sex role structure. Construction of social distinctions before and after rise and consolidation of modern world system. Intersections of race and ethnicity with class and gender.

520 Seminar in Zooarchaeology (3) Approaches to analysis and interpretation of archaeological fauna. Detailed study of systematic techniques in history and biogeography. Prereq: Consent of instructor.

521 Laboratory Studies in Zooarchaeology (4) Examination and comparison of skeletons of major vertebrate groups, shells of terrestrial and aquatic molluscs, in relation to animal remains from archaeological contexts. Basic osteology and shell characteristics of species encountered in aboriginal sites; use of comparative collections. May be repeated. Maximum 8 hrs.

522 Seminar in Archaeology (3) Theoretical and practical issues in contemporary archaeology: ethnogenesis, paleoecology, evolution, taphonomy, ceramic analysis, agricultural origins, and regional archaeological cultures. May be repeated. Maximum 9 hrs.

530 Fieldwork in Archaeology (3-9) Practicum in surveying, excavating, processing, and analysis of archaeological data. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

550 Contemporary Issues in Anthropology (1-3) Review of recent directions in method and theory in anthropology. May be repeated. Maximum 6 hours.

560 Theory in Archaeology (3) Detailed consideration of theory in contemporary archaeology; models of scientific explanation, research design, data collection, and interpretation of historical processes, and methods of analysis and interpretation.

561 Archaeological Resource Management (3) Federal legislation and regulations affecting identification, protection, and management of archaeological resources. Professional ethics and responsibilities and relationship of federal and state agencies, public interest groups, and professional archaeologists in conduct of federally sponsored archaeology. May be repeated. Maximum 6 hrs.

563 Lithic Artifact Analysis (3) Methods for analyzing prehistoric stone tools in practical laboratory/lecture format. Stone tool production, use, stylistic variability, and discard processes.

564 Archaeology of Southeastern United States (3) Historical archaeological research on prehistoric American Indian cultures in Southeastern United States; Tennessee prehistory.

568 Advanced Human Variation (3) Genetic and morphological variation among extinct human groups; relationships of variation to geography, ecology and subsistence.

571 Forensic Anthropology (3) Application of physical anthropology to problems in human identification. Determination of age, sex, and race of skeletal and preparation of reports for legal medicine. Prereq: 480.

582 Paleoanthropology (4) Fossil record from origin of hominids to appearance of anatomically modern humans. Functional morphology and phylogenetic relationships of fossil humans. Prereq: 480.

583 Skeletal Biology (3) Practical and theoretical approaches to analysis of prehistoric human skeletal remains. Demography, vital statistics, pathology, and measures of biological relationships as related to population as adaptive unit. Prereq: 480.

585 Anthropometry (3) Techniques of measuring and describing skeletal material and human subject; practical applications to growth, nutrition, and human engineering. Prereq: Consent of instructor.

589 Anthropological Genetics (3) Application of population and quantitative genetic theory to study of human and nonhuman primate populations. Prereq: Consent of instructor.

590 Method and Theory in Biological Anthropology (3) Current methods of analysis in biological anthropology and of past and current history of theoretical perspectives. Paleoanthropology, human osteology, and human variation and population structure. Prereq: Consent of instructor.

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

600 Doctoral Research and Dissertation (3-15) Pr/NP only. E

601 Advanced Graduate Research (1-15) Independent investigation of special problems in anthropology by advanced graduate students. May be repeated. Maximum 12 hrs. Only 3 hrs may count toward 600-level requirement.

611 Theory in Cultural Anthropology (3) Critical evaluation of current issues in cultural anthropology, primarily for doctoral students in cultural anthropology.

660 Advanced Seminar in Archaeology (3) Selected topics in prehistoric and historic archaeology. May be repeated. Maximum 6 hrs.
Admission Requirements

In addition to meeting the Graduate School's minimum requirements, the following specific admission requirements to the Master of Architecture program must be met.

Track 1 requires a minimum of 48 semester hours of undergraduate preparation and 60 semester hours of graduate coursework, taking approximately 3 1/2 years of full-time study. A minimum of 4 hours of architectural electives or approved electives from another discipline must be taken at the 500 level or above.

Track 2 requires a minimum of 30 semester hours of graduate coursework. Both tracks require 6 hours of Thesis 500 with a public presentation and oral defense of the thesis. Retention in the program is contingent upon evidence of satisfactory progress toward the degree. Each student's progress will be reviewed each semester by the Graduate Program Head. Any questions regarding progress will be reviewed by the Graduate Program Advisory Committee.

Degree Requirements

For Track 1 applicants, a bachelor's degree with a 3.0 GPA from a regionally accredited college or university is required. International applicants must have an equivalent 4-year degree and a 3.0 GPA. Candidates with a GPA less than 3.0 may be considered for conditional admission when evidence of exceptional promise is identified. Undergraduate work must include at least twelve semester hours of humanities, a basic understanding of physical principles and analytical procedures and an understanding of mathematical principles and analytical procedures, as well as a general understanding of the use of computers. The School requires a separate application for Architecture including an essay and three letters of recommendation. A personal on-site interview is desirable but not mandatory. For those applicants from accredited 4+2 architecture programs, a portfolio is required in addition to the above requirements.

For Track 2 applicants, a Bachelor of Architecture degree from an NAAB accredited program, or foreign equivalent is required. Candidates with a GPA less than 3.0 may be considered for conditional admission when evidence of exceptional promise is identified. Submission of a portfolio with a separate application to Architecture to include an essay and three letters of recommendation are also required. A personal on-site interview is desirable but not mandatory.

The general portion of the Graduate Record Examination is required of all applicants. Applicants should take the GRE at least one semester in advance of application for admission.

GRADUATE COURSES

403 Introduction to Preservation (3) History, theory, and legal aspects of architectural preservation and restoration.


405 Descriptive Analysis of Historic Buildings (3) Identification and analysis of characteristic elements of buildings from various architectural periods. American architecture, survey techniques.

406 Ideas in Architecture (3) Historical and critical review of major ideas of architecture through the ages. Open to all students.

410 History and Theory of Urban Form (3) Patterns of community development. Selected historical and contemporary examples. Basic urban design issues and exemplary design approaches through lectures, readings, essays, and sketch studies. Historical change in urban form and design.

412 Non-Western & Indigenous Architecture (3) Building responsive to climate, material availability, and economic level, as designed by anonymous builders. Pre-historic times to present throughout the world. Fertile Crescent; Indus Valley; Hindu, Buddhist, and Mughal architecture of India, China, and Japan.

413 Tennessee Architecture (3) History of settlement patterns and building in Tennessee. Reading assignments, lectures, discussion, and field trips. Historical change in urban form and design.

414 History of Architectural Technology (3) Building materials and construction techniques from antiquity to present.

415 Medieval Architecture (3) History of architecture from the decline of Rome to the beginning of Renaissance.

417 The International Style (3) Survey of architecture of early modern movement, primarily in Europe and America, 1900-1940.


420 American Architecture, 1840-1940 (3) Stylistic periods from Gothic Revival through twentieth century.

421 History of Landscape Architecture (3) Intellectual, social, and geographical influences that provide the theoretical basis for design throughout history. Selected examples of landscape architecture analyzed in terms of design.

422 Modern East European Architecture (3) Twentieth century architecture in Russia, Czechoslovakia, Poland, Hungary, East Germany, Romania, Bulgaria, Yugoslavia.

426 Special Topics in Architecture (1-6) Faculty initiated courses. Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. E

432 Computer Applications in Design II (3) Advanced computer aided design using three-dimensional modeling software. Design analysis using computer animation, rendering techniques, visualization, and video. Prereq: Computer Applications in Design I or consent of instructor. Sp

433 Computer Applications in Design III (3) Integration of three-dimensional modeling and technical analysis using computer to augment building design. Independent studies under faculty direction. Prereq: Consent of instructor. Sp

443 Building Energy Analysis (3) Balancing heat flow through external skin of residential and small and large commercial buildings. Local climate evaluation and site planning, building size and orientation, window area, wall treatment, infiltration control, and other design elements. Energy use quantification methods, and economic analysis of energy efficient design alternatives. Architectural program analysis of external and internal load dominated buildings. Prereq: 341.

444 Advanced Environmental Control Systems (3) In-depth analysis and innovative concepts in design of heating, ventilating, and air conditioning. Prereq: 341.
553 Advanced Topics in Architectural Technology (3) In-depth investigations and analysis: architectural technology lighting, structure, enclosure, mechanical and other architectural technologies. Prereq: Consent of instructor.

562 Professional Practice (3) Management and organizational theories and practices for delivering professional services: assessment of building industry and its influence on practice, analysis of basic management functions within professional firms; legal and ethical concerns facing practitioners today; and introduction to special obligations and privileges of design professional.


591 Foreign Study (1-9) 592 Off-Campus Study (1-9) 593 Independent Study (1-9)

Art
(College of Arts and Sciences)

MAJOR \n
Art \nNorman Magden, Head

DEGREE \n
M.F.A.

Professors:
Blairstone, J., M.F.A. Wisconsin 
Breakey, P., M.F.A. Yale 
Clarke, L., M.F.A. Wisconsin 
 Cleaver, D., M.F.A. Chicago 
Daehnert, R., M.F.A. Wisconsin 
Darrow, J., M.F.A. Illinois 
Dalscott, J., M.F.A. Nebraska 
Kennedy, W., M.F.A. Wisconsin 
Lee, B., M.F.A. Yale 
Leland, W., M.F.A. Tennessee 
Livingston, P., M.F.A. Wisconsin 
Lyons, B., M.F.A. Arizona 
Magden, Norman, Ph.D. Case Western Reserve 
Martinson, J., M.F.A. Michigan 
Moffett, F., M.F.A. Chicago 
Metros, S., M.F.A. Michigan 
Naff, A., M.F.A. Pennsylvania 
Sibley, C., M.F.A. California 
Stewart, C., M.F.A. Claremont 
Wilson, S., M.F.A. California 
Yates, N., M.F.A. North Carolina (Greensboro)

Associate Professors:
Haber, D., M.F.A. Michigan 
Hilles, T., M.F.A. Penn State 
Jung, A., M.F.A. Wisconsin 
Smith, P., M.F.A. Rhode Island 
Wright, S., M.F.A. Stanford

Assistant Professors:
Brogden, S., M.F.A. New York College of Ceramics 
Everson, D., M.F.A. Ohio 
Jong, A., M.F.A. Wisconsin 
Smith, P., M.F.A. Rhode Island 

THE MASTER'S PROGRAM

To become a candidate, the applicant must be admitted by The Graduate School and approved by the Department of Art. In addition to the admission requirements of The Graduate School, the Department of Art specifically requires the following:

1. A detailed letter of intent including statement requesting assistantship, if desired.
2. Three letters of recommendation from former professors or professionals in the field.
3. An undergraduate major in art or equivalent proficiency.
4. A portfolio to be evaluated by the faculty.

Further information is available by writing to the Department of Art.

M.F.A. Requirements

A minimum of 60 hours is required:

1. Successful completion of 20 hours of studio in a concentration area. An inter-area program must be approved by the graduate faculty only after the second semester in residence. Ten hours of concentration must be in second year courses (512, 514, etc.)
2. A minimum of 9 hours of graduate level academic (non-studio) courses of which at least 6 hours are to be in art history.
3. Eleven hours of electives which may consist of any combination of courses offered by the University for graduate credit.
4. Art 599, Project in Lieu of Thesis (20 hours). A third year of thesis study. Students must have completed all other coursework prior to registration.
5. Four semesters (40 hours) beyond the Bachelor's degree are required in residence. An exception is made for working professional designers who may complete their first 20 hours, with the permission of the faculty, on a part-time basis.
6. The candidate's committee will consist of a minimum of 5 members and a maximum of 6 members and will be appointed prior to registration for 599. The committee must consist of one faculty member from the
candidate's concentration area (designated as chairperson) and a faculty member from outside the concentration area. The inclusion of an Art History faculty member on each committee is encouraged.

Exhibition and oral examination: With the completion of all requirements for the M.F.A., the student must produce an exhibition and, in the presence of that work, must satisfactorily complete an oral examination.

Academic Standards
1. First-year evaluation: At the end of the first 2 semesters in residence, the student must present a portfolio for evaluation by the faculty and receive permission to continue in the program.
2. Second-year evaluation: With completion of all coursework, the student must present work for evaluation by the faculty and receive permission to register for Projects in Lieu of Thesis.
3. If, in a review by the student's major area faculty, the student's progress is deemed insufficient, the faculty may recommend a work period without advancement toward the degree, probation with specific goals set for a specific time, or dismissal.

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.F.A. program in Art is available to residents of the states of Delaware, or Kentucky (concentration in graphic design only). Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE MINOR IN THE HISTORY OF ART
A graduate minor in Art History may be arranged with consent of the student's committee, the instructors involved, and The Graduate School. Prerequisite is an undergraduate Art History minor, or its equivalent, and reading knowledge of French, German, or Italian, unless waived by the Art History faculty.

Art
GRADUATE COURSES
481 Museology I: Museums, Purpose and Function (3) Development of museums of art, history, natural and applied science. (Same as Anthropology 481.)
482 Museology II: Exhibition Planning and Installation (3) Exhibition concept, development and implementation. Exhibition design and installation techniques. Publicity, production, matting and framing, shipping and storage. Prereq: 481 and consent of instructor. (Same as Anthropology 482.)
484 Museology III: Field Projects (1-12) Special field projects: restoration, preservation, registration, and other related research on or off campus. Prereq: 481 and 482, and consent of instructor. May be repeated. Maximum 12 hrs. (Same as Anthropology 484.)
499 Special Topics (3) Student- or instructor-initiated course offered at convenience of department. May be repeated. Maximum 12 hrs.
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
507 Professional Practices: Teaching Internship (1) Individual study in development of skills and individuality in teaching studio courses. For students who are not ARTMAAs, Prereq: Consent of instructor. May not be used toward degree requirements. May be repeated. S/NC only.
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.
595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.

Art Ceramics
GRADUATE COURSES
421 Ceramics: Advanced Handbuilding (4) Continual investigation of ceramic form; development of individual direction. Prereq: Ceramics: Handbuilding and Throwing II. May be repeated. Maximum 12 hrs.
422 Ceramics: Advanced Throwing (4) Continual investigation of ceramic form; development of individual direction. Prereq: Ceramics: Handbuilding and Throwing II. May be repeated. Maximum 12 hrs.
424 Ceramics: Clays and Glazes (3) Clay chemistry, clay bodies, glaze theory and calculation. Formulating, mixing and testing of clay bodies and glaze formulas. Prereq: Ceramics: Portfolio Review.
425 Ceramics: History Seminar (3) History of ceramics through lectures and student presentations. May not be used toward art history requirement. Prereq: Ceramics: Portfolio Review.
426 Ceramics: Kiln Design (3) Designing kilns, traditional and modern refractories, construction methods, and kiln operation. Prereq: Ceramics: Portfolio Review.
429 Ceramics: Special Topics (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
521 Graduate Ceramics I (2-5) May be repeated. Maximum 10 hrs.
522 Graduate Ceramics II (2-5) May be repeated. Maximum 10 hrs.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.
595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E

Art Drawing
GRADUATE COURSES
419 Special Topics in Drawing and Painting (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
511 Graduate Drawing I (2-6) May be repeated. Maximum 10 hrs.
512 Graduate Drawing II (2-6) May be repeated. Maximum 10 hrs.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.
595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E

Art Design/Graphic
GRADUATE COURSES
405 Computer Enhanced Graphic Design (3) Exploration of new technologies and their significance to graphic design. Prereq: Intermediate Graphic Design I. Graphic Design Production with a grade of C or better, and consent of instructor. May be repeated. Maximum 6 hrs.
451 Advanced Graphic Design (3) Theory and techniques of visual problem-solving as applied to advanced applications of graphic design. Prereq: Intermediate Graphic Design II with a grade of C or better.
452 Graphic Design Seminar (3) Discussion of design and professional issues: politics, economics, and ethics for graphic designer. Cumulates in student-initiated project. Prereq: 451 with a grade of C or better.
453 Advertising Illustration (3) Media and techniques as applied to advertising illustration. Prereq: Black and White Illustration and successful completion of any portfolio review.
454 Editorial Illustration (3) Media and techniques as applied to editorial illustration. Prereq: Black and White Illustration and successful completion of any portfolio review.
456 Graphic Design Practicum (3-12) Practical work experience in graphic design field. Only by prearrangement with department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
459 Special Topics in Graphic Design (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
550 Studies in Graphic Design/Illustration History (3) Design and illustration ca. 1850 to present. Prereq: M.F.A. candidate or consent of department. May be repeated. Maximum 6 hrs.
551 Graphic Design I (2-6) May be repeated. Maximum 10 hrs.
552 Graphic Design II (2-6) May be repeated. Maximum 10 hrs.
553 Computer Enhanced Design (2-6) Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.
595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E

Art History
GRADUATE COURSES
403 History of Photography (3) Survey of history of photography from introduction of daguerreotype and calotype to more recent trends. Aesthetics and use of photography as medium for artistic expression.
Art

411 Art of Indian Asia (3) History of Indian art: Central Asia and Southeast Asia. Writing-emphasis course.

415 Chinese Art (3) Survey from pre-Shang Dynasty to contemporary movements in China, Taiwan, and Hong Kong. New discoveries. Writing-emphasis course.


425 Early Christian and Byzantine Art to 1350 (3) Art in Italy and the Eastern Empire from the beginnings of Christian art to 1350. Mosaic, painting, sculpture and architecture. Writing-emphasis course. (Same as Judaic Studies 425.)

431 Medieval Art of the West, 800-1400 (3) Western European art of the “Dark Ages,” Romanesque, and Gothic periods. Writing-emphasis course. (Same as Judaic Studies 431.)

441 Northern European Painting, 1350-1600 (3) Gothic periods. Writing-emphasis course. (Same as Judaic Studies 425.)

443 Art of Northern Europe, 1600-1875 (3) Concentrated study of Bruegel, Rubens, Rembrandt, Georges de la Tour, Vermeer, Poussin, and Hals. Writing-emphasis course.


453 Art of Southern Europe, 1575-1700 (3) Concentrated study of Caravaggio, Bernini, and Italian Baroque developments in all media. Spanish Baroque painting and sculpture: Velazquez. Writing-emphasis course.

471 History of North American Art (3) Landmarks in painting, architecture, sculpture, and design from prehistoric to 1900.

472 History of 20th-Century American Art (3) Developments in architecture, painting, and design from 1900.

473 19th-Century American Painting (3) From West and Copley to emergence of “The Eight.”

474 Theory of 20th-Century Art in Europe and America (3) Theoretical basis for modern movement. Analysis and discussion of individual works of art in light of contemporary writings by artists and theorists. Prereq: Western Art I and II, or consent of instructor.


479 Special Topics in Art History (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Painting III. May be repeated. Maximum 12 hrs.

483 History of American Sculpture (3) American sculpture from prehistory to 1900’s.

485 History of Printmaking (3) Prints from 15th century to present. 20th century in Europe and U.S. Prereq: 172 and 173.

486 Art of Indian Asia (3) History of Indian art: Central Asia and Southeast Asia.

488 Studies in Art History (3) Concentration in individually selected area. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

498 Studies in Medieval Art (3) Art and architecture of Middle Ages: major monuments from Byzantium or western Europe. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

520 Studies in Italian Renaissance Art (3) Art and architecture of 14th, 15th, and 16th centuries in Italy. Early or High Renaissance or Mannerist periods. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

523 Studies in Baroque Art (3) 17th-century art and architecture: major artists and works from southern or northern Europe. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

524 Studies in Modern Western Art (3) Selected topics in 19th- and 20th-century western art. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

525 Studies in Modern American Art (3) Selected topics in 19th- and 20th-century American art. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

526 Studies in Asian Art (3) Selected topics in Japanese or Chinese art. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

527 Special Topics in Art History (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

548 Graduate Painting I (2-6) May be repeated. Maximum 10 hrs.

549 Graduate Painting II (2-6) May be repeated. Maximum 10 hrs.

550 Graduate Watercolor I (2-6) May be repeated. Maximum 10 hrs.

551 Graduate Watercolor II (2-6) May be repeated. Maximum 10 hrs.

553 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.

555 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. Prereq: Intermediate Intaglio or consent of instructor. May be repeated. Maximum 12 hrs.

559 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.

595 Visiting Artist Seminar (3) Contemporary art issues by different visiting artists. Prereq: Not used toward art history requirement. May be repeated. Maximum 12 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E.

Art Painting

GRADUATE COURSES

413 Painting IV (6) Advanced painting, individual concepts by different visiting artists. Prereq: Intermediate Intaglio or consent of instructor. May be repeated. Maximum 12 hrs.


419 Special Topics in Drawing and Painting (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

513 Graduate Painting I (2-6) May be repeated. Maximum 10 hrs.

514 Graduate Painting II (2-6) May be repeated. Maximum 10 hrs.

515 Graduate Watercolor I (2-6) May be repeated. Maximum 10 hrs.

516 Graduate Watercolor II (2-6) May be repeated. Maximum 10 hrs.


533 History of Film and Modern Art (3) Study of development and interaction between cinematic arts and visual arts within context of modern art history. Available for Art History credit. (Same as Cinema Studies 433.)

535 Cinematography as Art (3) Continued development of concepts and techniques for creation of film as art form: individual projects. Prereq: Introduction to Cinematography as Art and Media Arts Portfolio Review or consent of instructor. May be repeated. Maximum 9 hrs.

536 Video Art (3) Continued development of concepts and techniques for creation of video works as art form: individual projects. Prereq: Introduction to Cinematography as Art and Media Arts Portfolio Review or consent of instructor. May be repeated. Maximum 9 hrs.

539 Special Topics in Media Arts (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

441 Digital Photography II (4) Continuation of exploration and implications of use of computer in photography. Prereq: Digital Photography I and consent of instructor.

442 Large Format Photography II (4) Studio course that continues exploration of use of large format camera in photography. Prereq: Large Format Photography I and consent of instructor.

531 Photography I (2-6) May be repeated. Maximum 10 hrs.

532 Photography II (2-6) May be repeated. Maximum 10 hrs.

535 Media Arts I (2-6) May be repeated. Maximum 10 hrs.

536 Media Arts II (2-6) May be repeated. Maximum 10 hrs.

577 Studies in Media as Art (3) Selected topics in theory and history of media as art form. May be repeated. Maximum 9 hrs.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.

595 Special Topics in Media Arts (3) Selected topics in theory and history of media as art form. May be repeated. Maximum 12 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E.

Art Printmaking

GRADUATE COURSES

462 Intaglio III (3-6) Exploration of individual projects through advanced color printing methods and combinations with other print media. Prereq: Intermediate Intaglio or consent of instructor. May be repeated. Maximum 12 hrs.

463 Lithography III (3-6) Exploration of individual projects through advanced lithographic methods in combination with other print media. Prereq: Intermediate Lithography or consent of instructor. May be repeated. Maximum 12 hrs.

464 Screen Printing III (3-6) Individual development of screen printing problems and techniques: development of images and personal concept. Prereq: Intermediate Screen Printing or consent of instructor. May be repeated. Maximum 12 hrs.

466 Special Topics in Printmaking (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.

469 Special Topics in Printmaking (3) Selected topics in theory and history of media as art form. May be repeated. Maximum 12 hrs.

511 Printmaking I (2-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. May be repeated. Maximum 10 hrs.

512 Printmaking II (2-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. May be repeated. Maximum 10 hrs.

563 Printmaking III (2-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. May be repeated. Maximum 10 hrs.
screen printing, photo-print methods and monoprint. Prereq: 561, 562.

554 Printmaking IV (2-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. Prereq: 561, 562, 563.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.

595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/N only. E

Astronomy
See Physics and Astronomy

Audiology and Speech Pathology
(College of Arts and Sciences)

MAJORS

DEGREES

Audiology ................................. M.A.
Speech and Hearing Science ........ Ph.D.

Speech Pathology .......... M.A.

Patrick J. Carney, Head

Professors:

Asp, Carl W., Ph.D. ............... Ohio State
Carney, Patrick J., Ph.D. .......... Iowa
Nabelek, Anna (Emeritus), Ph.D. Poland
Nabelek, Igor V. (Emeritus), Sc.D............. Prague
Peterson, H. A. (Emeritus), Ph.D. ..... Illinois
Silverstein, B. (Emeritus), Ph.D. .......... Purdue

Associate Professors:

Burchfield, Samuel B., Ph.D........... Michigan State
Gordon, Charles J., M.A. ................. Tennessee
Kankel, Ronald T., Ph.D. ............... Tennessee
Swanson, Elmer A., Ph.D. ........ Purdue

Thelin, J. W., Ph.D. ................. Iowa

Assistant Professor:

Erickson, Mary E., Ph.D. .......... Southern Cal

Harkrider, Ashley, Ph.D. .......... Texas

Hedrick, Mark, Ph.D. ........... Vanderbilt

McCullough, Gary .................. Vanderbilt

Ruck, Jack L., Ph.D. .......... Pittsburgh

THE MASTER'S PROGRAM

A major is offered in Audiology or in Speech Pathology Admission to these graduate programs is competitive. Both of these graduate programs are accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association.

The master's degree program in speech pathology is a two-year program and consists of the completion of 42 semester hours of academic content courses (including thesis) plus practicum. A minimum of three academic courses must be completed during all semesters (terms) except one. That is, students must take a minimum of nine semester hours of academic courses for at least four semesters or terms and six semester hours in the other semester or term.

The required courses are 506, 511, 526, 561, 582, 593 or 541, 520 or 524, and at least two seminars from the following courses: 522, 523, 531, 626, or 681 and at least 15 hours of elective courses. Undergraduate coursework may not be substituted for seminar courses. Students who have not completed an undergraduate course in each of the following three areas: articulation/phonological processing disorders, voice disorders, and fluency disorders, must complete one graduate course in each of the three areas.

Students majoring in speech pathology may elect either the thesis or non-thesis option. The master's program in speech pathology with thesis includes six hours of 500 credit in the preparation of an acceptable thesis representing original independent work, and a final oral examination. Students in the non-thesis option must pass a final written examination.

Students majoring in audiology may elect either the thesis or non-thesis option. Students in audiology are required to take 511. The master's program with thesis will include a minimum of 33 semester hours of approved graduate credit in audiology, including 6 hours of 500 credit in the preparation of an acceptable thesis representing original independent work, and a final oral examination. At least two-thirds of these must be at the 500 or 600 level. Students in the non-thesis option program must present a total of 39 semester hours in the audiology program of approved graduate credit and pass a final written examination.

THE DOCTORAL PROGRAM

The Ph.D. program in Speech and Hearing Science seeks to develop individuals for professional careers in a variety of positions including research and college teaching in the concentration areas of speech and language pathology, audiology, speech-language science or hearing science. The degree program is research oriented with primary emphasis on processes involved in normal, deviant, or disordered speech, language, and hearing. Students will be expected to demonstrate their knowledge in areas related to the concentrated field of study. These areas include:

1. Basic speech, hearing, or language processes;
2. Basic speech, hearing, or language disorders or differences;
3. Related disciplines providing insight into human communication processes;
4. Technical skills in instrumentation and experimental design which enable the student to investigate problems pertaining to speech and hearing processes.

The program will normally consist of three or more calendar years of graduate study beyond the master's degree with the first year being devoted primarily to formal coursework and the last year to full-time research culminating in the doctoral dissertation.

The total program is a minimum of 60 semester hours, including a minimum of:
1. 24 semester hours in dissertation 600.
2. 6 semester hours in a research tool.
3. 6 semester hours in a cognate area outside the department.
4. 24 semester hours in 600-level coursework within the department of which:...
52 Audiology and Speech Pathology

a. a minimum of 6 semester hours in the topic of major interest;
   b. a minimum of 6 semester hours in a topic of interest;
   c. 3 semester hours in 611; and
   d. 3 semester hours in supervised teaching experience.
5. A comprehensive examination to demonstrate knowledge in the concentration area and an examination of research competence.
6. A final oral examination.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.A. program in Audiology is available to residents of the state of Arkansas. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

431 Stuttering (2) Nature, appraisal and treatment. Prereq: 304 or consent of instructor.

433 Observation of Clinical Practice (1) Prereq: Speech and Language Development, Articulation Disorders, or consent of instructor.

434 Clinical Practice in Speech-Language Pathology II (1-4) Prereq: 433 and consent of instructor. Enrollment limited to 2 hrs must have prior departmental approval.


455 Problems in Speech Pathology (1-3) Prereq: Consent of instructor.


473 Audiology II (3) Basic principles of clinical audiology: pure tone, speech, masking, and observation of special auditon tests. Prereq: 371.

494 Aural Habilitation/Rehabilitation of the Hearing Impaired (3) Psychosocial aspects, amplification components/characteristics, assistive devices, speech acoustics, speech perception, speech reading, parent-infant, preschool, school years of children, communication impairments/handicaps/remediation of adults, effects of aging/remediation on the elderly, and case studies. Prereq: Consent of instructor. May be repeated. 306 or consent of instructor.

475 Consent of instructor.

473 Audiology III (3) Basic principles of clinical audiology: pure tone, speech, masking, and observation of special auditon tests. Prereq: 371.

494 Aural Habilitation/Rehabilitation of the Hearing Impaired (3) Psychosocial aspects, amplification components/characteristics, assistive devices, speech acoustics, speech perception, speech reading, parent-infant, preschool, school years of children, communication impairments/handicaps/remediation of adults, effects of aging/remediation on the elderly, and case studies. Prereq: Consent of instructor. May be repeated. 306 or consent of instructor.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty teaching. May be used toward degree requirements. May be repeated. S/N only. E

504 Appraisal of Speech and Language Disorders (3) Diagnostic procedures for children and adults with speech and language problems including observation and practice with diagnostic tests. Prereq: Communication Disorders, Phonetics and Acoustics of Speech, and 433, or equivalent or consent of instructor.

506 Neural Bases of Speech and Language (3) Structure and function of the peripheral and central nervous systems, role in speech and language. Prereq: 306.

507 Anatomy and Physiology of Hearing (3) Structure and function of the peripheral and central auditory systems, and their roles in mediating auditory pro-

cesses. Prereq: 473 or equivalent or consent of instructor.

511 Introduction to Research in Speech and Hearing (3) Analysis of research in speech and hearing, including statistical methods, application of statistics, application of techniques, and compilation of a proposal and hypothetical pilot research project. Prereq: 473 and 494. May be repeated. Maximum 9 hrs.

512 Clinical Practice in Audiology (1-4) Prereq: 473 and 494. May be repeated. Maximum 9 hrs.

513 Clinical Practice in Audiology: Off-Campus Sites (1-4) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

514 Practicum in Verbo-Tonal Habilitation (1-4) Prereq: 494, 595, or consent of instructor. May be repeated. Maximum 6 hrs.

515 Practicum in Aural Rehabilitation (1-4) Prereq: 473 and 494. May be repeated. Maximum 6 hrs.

517 Instrumentation in Audiology and Speech Pathology (3) Principles of instrumentation in audiology and speech pathology; laboratory assignments for familiarization of students with instruments for measuring speech and hearing processes.

520 Aphasia (3) Historical review of aphasia literature, theories of brain functioning, and management of aphasia. Prereq: 411 or consent of instructor.

522 Seminar in Articulation and Phonological Processing Disorders (3) Current research in the development and management of speech and phonological processing disorders. Prereq: Articulation Disorders or equivalent or consent of instructor.

523 Seminar in Voice Disorders (3) Current research in the development and management of voice disorders. Prereq: 411 or consent of instructor.

524 Traumatic Brain Injury (3) Advanced neurogenic: cognitive-linguistic implication. Medical and speech-language rehabilitation research issues associated with traumatic brain injury (TBI) related to adult TBI population. Prereq: 506 and 520, or consent of instructor.

526 Dysphagia (3) Clinical diagnosis, evaluation, and treatment of adult swallowing disorders and clinical interpretation of research literature on dysphagia. Prereq: 506 or consent of instructor.

531 Seminar on Stuttering (3) Significant research in stuttering. Prereq: 431 or consent of instructor.

532-33-34 Advanced Clinical Practice in Speech-Language Pathology (1-4, 1-4, 1-4) Prereq: 432 or equivalent or consent of instructor. May be repeated. Maximum 9 hrs. Enrollment for less than 2 hrs must have prior departmental approval. Prereq: 371.

535-36 Advanced Clinical Practice in Speech-Language Pathology: Off-Campus Sites (1-4, 1-4) Prereq: 100 hrs clinical experience, consent of instructor. May be repeated. Maximum 6 hrs each. Enrollment for less than 2 semester hrs must have prior departmental approval.

538 Advanced Clinical Practice in Speech-Language Pathology: Public Schools (1-4) May be repeated. Maximum 6 hrs. Enrollment for less than 2 hrs must have prior departmental approval.


541 Pediatric Oromotor Disorders (3) Evaluation, diagnosis, and treatment of pediatric oromotor disorders, therapy for normal acquisition of feeding and pre-
### Aviation Systems

**Institute:** UT Space Institute

**Degree:** M.S.

**Professors:**
- Collins, F. G., Ph.D.
- Kimberly, R. D.
- Mason, A. A.
- Paludan, C. T.
- Wu, J. M.
- Young, R. L.

**Research Assistant Professor:**
- Stellar, Frederick W., M.S.

**Program:**
- The University of Tennessee Space Institute offers a program leading to the Master of Science degree with a major in Aviation Systems. The Aviation Systems program is designed for those who possess a Bachelor's degree in engineering or science and wish to study under a "system philosophy" toward careers in research and development or administration in areas pertinent to aviation. Current emphases include flight testing, aircraft design, aviation meteorology, air traffic control, and airport management.

**Requirements:**
- 12 hours of electives in the major field, mathematics or engineering.
- 12 hours of Aviation Systems 500, demonstrating the ability to conduct and report on an independent investigation.

**Non-Thesis Option:**
- The non-thesis program will be permitted in special circumstances and involves satisfactory completion of the following requirements:

**Research and Development Specialization**
- 12 hours of 500-level courses in the major field of aviation systems.
- 3 hours in industrial engineering (engineering management).
- 3 hours in economics or finance.
- 3 hours of electives selected from the major field, mathematics or engineering.

**Thesis Option:**
- 12 hours of 500-level courses in the major field of aviation systems.
- 3 hours in industrial engineering (engineering management).
- 3 hours in economics or finance.
- 12 hours of 500-level courses in the major field, mathematics or engineering.
- A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper.

**Administration Specialization**
- 12 hours of 500-level courses in the major field of aviation systems.
- 3 hours in industrial engineering (engineering management).
- 3 hours in economics or finance.
- 12 hours of electives selected from the major field, mathematics or engineering.
- 3 hours of an assigned project under Aviation Systems 550.
- A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper.
Biochemistry and Cellular and Molecular Biology

(College of Arts and Sciences)

MAJOR

Biochemistry and Cellular and Molecular Biology ............. M.S., Ph.D.

John W. Koontz, Head

Professors:
Bagby, R. M., Ph.D. ........................................ Illinois
Carlson, J. G. (Emeritus) (Distinguished Prof.), Ph.D. .......... Pennsylvania
Chen, T. T., Ph.D. .............................................. Florida
Churchi, Jorge E., Ph. D. ...................................... Sheffield Handel, Mary Ann (Distinguished Prof.), Ph.D. ................. Kansas State
Hochman, Ben (Emeritus), Ph.D. ....................... California
Jeon, K. W., Ph.D. .............................................. London
Joshi, J. G. (Emeritus), Ph.D. ................................ Poona
Kennedy, J. R., Ph.D. ........................................ Iowa
Liles, J. N. (Emeritus), Ph.D. .............................. Ohio State
MacCabe, J.A, Ph.D. ........................................ California (Davis)
McKee, B. D., Ph. D. ......................................... Michigan State
Monty, Kenneth J., Ph.D. ..................................... Rochester
Rich, L. Evans (Emeritus), Ph.D. ............................ Chicago
Salo, T. P. (Emeritus), Ph.D. ............................... Michigan
Shivers, C. A., Ph.D. .......................................... Michigan State
Welch, H. G. (Emeritus), Ph.D. .............................. Florida
Whitson, G. L. (Emeritus), Ph.D. ............................ Iowa
Wicks, Wesley D., Ph. D. ..................................... Harvard

Associate Professors:
Ganguly, R., Ph.D. .............................................. Nebraska
Hall, J. C., Ph.D. .............................................. Illinois
Howell, Elizabeth E., Ph.D. ................................ Lehigh
Koontz, John W. (Liaison), Ph.D. ....................... Kentucky
Peterson, Cynthia B., Ph.D. ................................. LSU
Prosper, R. A., Ph.D. ........................................ Chicago
Roberts, Daniel M., Ph. D. ................................. California (Davis)
Sarparos, Engin H., Ph. D. .................................. Hackett

Assistant Professors:
Bruce, Barry, Ph.D. ........................................ California (Berkeley)
Dealwis, C., Ph.D. ........................................... London
Park, J., Ph.D. ................................................. Texas A&M

Research Professors:
Meur, Peter, Ph.D. ........................................ Harvard
Rinchik, Eugene, Ph.D. .................................... Duke

Research Assistant Professor:
Kliebig, Mitch, Ph.D. ....................................... Tennessee

REQUIREMENTS FOR ADMISSION

Applicants for graduate study are expected to have a background equivalent to that required of undergraduate majors in this department. This includes a knowledge of the basic principles of biochemistry, cell biology, genetics and physiology. Requirements for admission are:

1. One year of general biology or the equivalent;
2. A minimum of 8 semester hours of approved biology courses beyond the introductory level and including the subject areas of genetics, cell biology and physiology;
3. Two years of chemistry including one year of general chemistry and one year of introductory Organic Chemistry with laboratory;
4. At least one semester of biochemistry;
5. One year of calculus;
6. One year of physics;
7. Graduate Record Examination scores; and
8. A minimum grade-point average of 3.0 out of 4.0.

Otherwise superior students, deficient in one or more of the above requirements, may be admitted at the discretion of the department's Graduate Recruiting Committee.

THE MASTER'S PROGRAM

1. Biochemistry and Cellular and Molecular Biology 511-12-13, 515-16, and 517.
2. Completion of course requirements as determined by the candidate's faculty committee.
3. Achievement of a 3.0 or better GPA in all courses taken for graduate credit.
4. Participation in 601 and 603 during the entire period of residence. Participation in at least one journal club chosen from among 605-608 for at least three semesters.
5. Six hours of master's research and a thesis.
6. A final examination that covers both the thesis endeavor and the subject matter of the course requirements.

THE DOCTORAL PROGRAM

1. Biochemistry and Cellular and Molecular Biology 511-12-13, 515-16, and 517.
2. At least two additional approved graduate courses in the life sciences or chemistry, or physics, or other physical science to be determined upon consultation with the mentor and the dissertation committee. No survey courses will be accepted.
3. At least 6 hours of topics offered in 615 or its equivalent.
4. Participation in 601 and 603 during the entire period of residence. Participation in at least one journal club chosen from among 605-608 for three semesters.
5. Comprehensive examination, taken before the end of the third year of study.
6. A dissertation reporting the results of original and significant research carried out during the term of candidacy.
7. A final oral examination which will be concerned primarily with the student's dissertation.

Petitioning for Master's Degree

Students who have passed the comprehensive examination in the Ph.D. program and have completed at least 30 hours of approved coursework for graduate credit, at least two thirds of which must be at or above the 500 level, may petition the department for award of a master's degree.

The additional requirements for such a degree are:

1. The preparation of a research manuscript suitable for submission for
publication in a major scientific journal and oral defense of that manuscript before an examining committee of four faculty members appointed by the head of the department, at least two of whom shall be members of the department; or

2. Publication of at least one full-length paper in a major scientific journal as senior author.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of certain states to enroll in certain programs at UT on an in-state tuition basis. The M.S. program in Biochemistry and Cellular and Molecular Biology is available to residents of the state of Kentucky. Additional information may be obtained from the Graduate Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

401-402 Biochemistry-Molecular Biology I, II (3, 3) 401—Amino acid structure and chemistry, protein structure and chemistry, protein folding, enzyme behavior and function, reaction mechanisms, catalysis and kinetics, energy transfer, synthetic metabolism including photosynthesis and protein transport. 402—Structure of DNA and RNA, experimental methods of analyzing nucleic acids, mechanisms of RNA and protein synthesis, mechanisms of DNA replication, repair and recombination, chromosome structure and function, regulation of gene expression, genomics, and genomics and mechanisms of biological regulation. Prereq: Biology 240 General Genetics, Chemistry 350-360-369 Organic Chemistry and Lab.


410 and 419 Comparative Biochemistry (4) and (4) Electrophy behavior, chemistry and structure of proteins; enzyme behavior and biological function; catalysis and energy capture; synthetic metabolism; nucleic acid function; protein synthesis, and biochemical genetics; regulation of biological processes. May not be counted if credit received for 401. Prereq: Chemistry 350-360-369 Organic Chemistry and Lab. Biology 140 General Organization of the Cell. Biology 240 General Genetics. 3 hrs and 3 discussion.

419 and 491 Cell Biology Laboratory (2) Experiments with enzymes, nucleic acids, and membranes and organelles. Chromatography, kinetics, hybridization, sequencing, and immunchemical methods. Prereq or coreq: 401 or 410. F,Sp

421 and 422 Cell and Tissue Structure and Function (4) Study of animal cells and tissues at light and electron micro scope levels. Prereq: Biology 140 Organization and Function of the Cell. 2 hrs and 2 labs.

429 Cell Biology Laboratory (3) Series of open-ended, discovery-based exercises developed to design and test new drugs using modern cell biology and computer technology modules. Chromatography, kinetics, hybridization, sequencing, and immunchemical methods. Prereq or coreq: 421 or 410. F,Sp


471-81 Biophysical Chemistry (3,3) Physicochemical principles with applications to biological systems.

471-1 Thermodynamics, chemical equilibrium; solution chemistry, transport; electrochemistry; kinetics, enzyme catalyzed reactions. 471-2 Elementary quantum chemistry; interactions of light with biological molecules; optical and magnetic spectroscopy, light scattering; case studies of selected macromolecules. Prereq: Calculus, Organic Chemistry, General Biology or consent of Instructor. (Same as Chemistry 471-81). F,Sp

480 Physiology of Exercise (3) (Same as Exercise Sciences 480).

500 Thesis (1-15) F/NP only. E

502 Registration for Use of Facilities (3-15) Required only if student not otherwise registered any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

511 Advanced Protein Chemistry and Cellular Biology (3) Cellular structure and function at molecular and supramolecular level in progression: protein structure and function; membrane structure and function; bioenergetics and membrane transport. Prereq: Prior knowledge of cell biology and biochemistry or consent of instructor.

512 Advanced Molecular Biology (3) Regulation of nucleic acid expression activity, nucleic acid structure and function; replication and repair of nucleic acids; gene expression; protein synthesis, post-translational modification; mRNA and proteins; cytoskeleton and cell growth. Prereq: 511 or consent of instructor. Sp

513 Advanced Protein Biochemistry and Cell Biology I (3) Advanced topics of cellular function and regulation of cell division and growth, and structure and function of supramolecular structures: cytoskeleton and cell junctions and adhesions. Prereq: 511. F

515 Experimental Techniques 1 (3) Modern experimental methodology and instrumentation lab: cellular collection, separation and identification; microscopy; nucleic acid purification and analysis; protein assays; enzyme purification; electrophoresis; computer analysis of nucleic acid and protein sequences. Lecture on theory of laboratory to accompany two lab periods per week. Primarily for departmental graduate students. Prereq: Consent of Instructor.

516 Experimental Techniques 11 (3) Laboratory rotations. Students work in laboratory of faculty member on clearly defined project. Written proposal and oral report. Primarily for departmental graduate students. Prereq: 515. S/NC only. Sp

517 Physical Biochemistry (3) Physics and chemistry of biological systems and molecules. Thermodynamics, equilibria and kinetics; chemistry of organic molecules; enzyme kinetics; binding reactions; spectroscopy; electrophysiology. Prereq: 511 or consent of Instructor.

520 Special Topics (1-2) Selected directed readings or special course in topics of current interest. Consent of instructor. 3-6 hrs. Prereq: Consent of instructor. F,Sp

525 Graduate Research Participation (3-12) Tutorial laboratory experience. May be repeated. Maximum 12 hrs. S/NC only.

530 Experimental Design and Analysis (3) Development of skills in strategies of experimental design and interpretation of experimental results. Critical discussion of research articles illustrating experimental design. Preparation of grant proposal in standard format to be read and discussed by class and by panel of faculty expert in area of proposal. Prereq: 511-12, 512-13, 516-17, Sp.

550 Advanced Concepts in Biophysics (3) Concepts related to structural biology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of Instructor. May be repeated.

550 Advanced Concepts in Neurobiology/Physiology (3) Concepts related to neurobiology/physiology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of Instructor. May be repeated.

561 Environmental Toxicology (3) (Same as Ecology and Evolutionary Biology 561.)

562 Introduction to Electron Microscopy - Transmission Electron Microscopy (4) Practical application to techniques for preparation of biological samples for viewing in transmission electron microscopy. Use of microtome and ancillary equipment. Darkroom techniques, preparation of materials for publication and special project. Admission limited only to departmentally approved graduate students. (Same as Botany 510.) 2 hrs and 2 lab.

564 Introduction to Electron Microscopy-Scanning Electron Microscope (3) Practical introduction to techniques of electron microscopy and to scanning electron microscope. Use of microscope, introduction to darkroom techniques and digital image processing, preparation of samples for observation, and special project. Prereq: Consent of instructor. 2 hrs and 1 lab.

570 Advanced Concepts in Cellular/Molecular Biology (3) Concepts related to cellular/molecular biology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

580 Advanced Concepts in Genetics/Developmental Biology (3) Concepts related to genetics/developmental biology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

600 Doctoral Research and Dissertation (3-15) F/NP only. E

601 Departmental Seminar (1) Invited speakers. Topics posted in advance. Required every semester in residence. S/NC only. F,Sp

603 Graduate Research Colloquium (1) Seminars and lectures dealing with current advances in fields of biochemical and biophysical methods. Prereq: knowledge of basic mechanisms of enzyme catalysis, gene expression, membrane structure and function, metabolic regulation, physical biochemistry, molecular genetics, cell biology, neurobiology, and related topics. Required every semester in residence. S/NC only. F,Sp

604 Current Topics in Environmental Toxicology (1) (Same as Ecology and Evolutionary Biology 604.) S/NC only. F,Sp

605 Journal Club in Neurophysiology/Physiology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

606 Journal Club in Structural Biology/Biochemistry (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

607 Journal Club in Cellular/Molecular Biology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.


610 Journal Club in Biochemistry, Cellular, and Molecular Biology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

611 Current Topics in Biochemistry, Cellular, and Molecular Biology (1-2) Critical reviews of research problems and methods in biochemistry, cell biology, and/or molecular biology. Oral presentations, written
Botany

(College of Arts and Sciences)

MAJOR

Botany ............................................ M.S., Ph.D.

Edward E. Schilling, Head

Professors:
Caponetti, J. D., Ph.D. .............. Harvard
Clebsch, E. E. C. (Emeritus), Ph.D. .... Duke
DeSelm, H. R. (Emeritus), Ph.D. ....... Ohio State
Evans, A. M. (Emeritus), Ph.D. ...... Michigan
Hallman, A. S. (Emeritus), Ph.D. ..... Ohio State
Herndon, W. R. (Emeritus), Ph.D. ... Vassar
Hickok, L. G. Ph.D. .................. Massachusetts
Holton, R. W. (Emeritus), Ph.D. ...... Michigan
Hughes, K. W., Ph.D. .......... Utah
Mullin, B. C., Ph.D. ................ North Carolina State
Petersen, R. H. (Distinguished Professor), Ph.D. .......... Columbia
Schilling, E. E. (Liaison), Ph.D. ... Indiana
Schwarz, O. J., Ph.D. .......... North Carolina State
Walne, P. L. (Benwood Distinguished Professor), Ph.D. .......... Texas

Associate Professors:
Amundsen, C. C., Ph.D. .............. Colorado
Pigliucci, M., Ph.D. ................ Connecticut
Smith, D. K., Ph.D. ................ Tennessee
Wolfford, B. E. (Curator), Ph.D. .... Tennessee

Assistant Professors:
Cruzan, M. B. C., Ph.D. . SUNY (Stony Brook)
Small, R. L., Ph.D. ................ Iowa State
von Arnim, A. G., Ph.D. .......... East Anglia (UK)

Lecturer:
McFarland, K. D., Ph.D. .............. Tennessee

The Department of Botany offers the Master of Science and Doctor of Philosophy degrees with concentrations in anatomy, bryology, cytology, cytenecology, ecology, genetics, lichenology, morphology, mycology, photobiology, physiology, phytology, and taxonomy.

The Department participates in a program of teaching and/or ancillary services to faculty and students. For further information, contact the Department Head or the Graduate Coordinator.

ADMISSION REQUIREMENTS

The Botany Department requires scores from the general portion of the Graduate Record Examination, at least three letters of recommendation or standard recommendation forms from academic or professional persons, a short statement describing reasons for interest in graduate education in botany, and the following academic requirements:

1. Bachelor's degree: a B.A. or B.S. from an accredited college or university and a cumulative grade-point average of 2.5 or better (on a 4.0 scale), with evidence of ability to do work of graduate quality.
2. General botany or general biology: 8 semester hours.
3. Advanced botany or closely allied biological sciences: 12 semester hours.
4. Physical sciences: general inorganic chemistry: 8 semester hours; organic chemistry: 8 semester hours. Physics highly recommended.
5. College mathematics: 6 semester hours including 1 term of calculus.

Evidence of a broad undergraduate background, an ability to do work of graduate quality, and an interest in the study of plant science are considered to be more important than the particular courses taken as an undergraduate. Accordingly, students lacking specific prerequisite courses but otherwise qualified may be admitted to graduate studies in botany. In such cases, the deficiencies should be removed as soon as possible, typically during the first year of the student's graduate program. The determination of deficiencies and the manner in which they will be removed will be decided upon by the student's doctoral committee during the first meeting with the student.

THE MASTER'S PROGRAM

The program for the Master of Science is designed to fit the needs of students who desire a less extensive course of study than the Ph.D. program. However, the applicant must be equally well prepared and display an aptitude and ability for advanced study. The M.S. includes thesis and non-thesis options.

Thesis Option
The thesis program is the usual route taken by botany students for the M.S. It is important that the entering student promptly identify a major professor and a suitable research project. The requirements for the thesis option consist of the following:
1. Satisfactory preparation of a written formulation and oral defense to the student's committee of a research proposal suitable for a thesis. This must be completed before enrollment in Botany 500.
2. Successful completion of 30 hours of graduate credit, at least two-thirds of which must be at the 500 level or higher.
3. Satisfactory completion of two hours at the 600 level.
5. Presentation of a 30-minute department seminar.
6. Educational service in the form of teaching and/or ancillary services; consult major professor and department head.

Non-Thesis Option
1. Satisfactory completion of 34 semester hours of approved graduate courses of which 30 semester hours must be in botany including Botany 503. At least two-thirds of the hours must be at the 500 level or higher.
2. Satisfactory completion of two hours at the 600 level.
3. Educational service in the form of teaching and/or ancillary services; consult major professor and department head.
4. Satisfactory performance on a final written examination on all work offered for the degree. The student's committee may also require that an oral examination follow the written examination.

THE DOCTORAL PROGRAM

The Doctor of Philosophy program is patterned to provide training that involves extensive independent research within the student's area of concentration. Although there is no formal program of coursework, the student's committee may require specific courses for the completion of the degree. Most students spend from three to five years working on their Ph.D.

Requirements for successful completion of the Ph.D. are as follows:
1. Satisfactory presentation of a research problem by means of a written proposal and an oral defense to the student's committee. This must be completed before enrollment in Botany 600.
2. Satisfactory performance on a written comprehensive examination.
3. Presentation of one or more cognate areas outside of the department totaling 6 hours of graduate credit with at least a B average.
4. Satisfactory performance on an examination in one modern foreign language (see Graduate Coordinator) or an A or B in French 302 or German 332.
5. Satisfactory completion of 6 hours at the 600 level (excluding dissertation).
7. Presentation of a departmental seminar near the end of the doctoral program.

Note: The listed requirements for the M.S. and Ph.D. degrees should be interpreted as minimal requirements. Specific stipulations or requirements such as additional foreign languages or an additional oral comprehensive examination may be required by the student's faculty committee.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

GRADUATE COURSES

401 Field Studies in Botany (1-3) Field experience and taxonomy of special plant groups. Topics vary: bryology, lichenology, phytology, agrostology, mycology, physiology, aquatic vascular plants, systematics, woody plants, and botanical photography. May be repeated under different topic. Maximum 9 hrs.

403 Plant Evolution (3) Evolutionary biology from plant perspective. Speciation, hybridization, polyploidy, selection of mating systems, phenotypic plasticity; comparison of characteristics of animal and plant systems. Lectures; paper discussions on primary literature; current research in evolutionary ecology and genetics. Prerequisite: General Botany or Biodiversity. Organization and Function of the Cell. (Same as Ecology and Evolutionary Biology 403.)

404 Plant Molecular Biology (4) Current research in plant molecular biology: techniques and procedures.
Genome structure, gene expression and regulation, transcription factors, plant development. Labs: isolation of DNA and RNA, molecular hybridization, transmission and transformation of specific sequences, PCR amplification, and DNA sequencing and transformation. PreReq: Biodiversity, Organization and Function of the Cell and Genetics with a grade of B or better and consent of instructor. 2 hrs. L. 2 hrs. Lab.

412 Plant Anatomy (4) Cells, tissues, and organs; development in vegetative and reproductive structures of vascular plants—seed plants. PreReq: General Botany or Biodiversity. Organization and Function of the Cell or equivalent.

431 Plant Ecology (4) Interactions between individuals, species, communities and their environments. Circulation of energy and matter in ecosystems. Weekly field trips or laboratory periods, and at least two weekend field trips. PreReq Field Botany or equivalent.

544 Seminar in Botany (1) Readings and discussions on evolution and genetics of plant species, wild relative and cultivated species. Prereq: General Botany or equivalent. 1 hr. 1 lab.

560-07 Advanced Topics in Botanical Sciences (1-3, 1-3) Experimental botanical science: nomenclature, morphology, and physiology of vascular plants, cryptogams, botany, cytology, and cell biology. Prereq: Biodiversity, Organization and Function of the Cell or equivalent. May be repeated. Maximum 12 hrs.

635 Environmental Assessment and Sustainable Development in Tropical and Subtropical Countries (3) Same as Ecology and Evolutionary Biology 635 and Planning 655.

662 Seminar in the History of Botany (2) History of botanical exploration and advances from early civilizations to modern periods. May be repeated. Maximum 4 hrs.

**Broadcasting**

**(College of Communications)**

**MAJOR**

**DEGREES**

Communications ........................................ M.S., Ph.D.

Barbara A. Moore, Head

Professors:

Holt, Darrel W. (Emeritus), Ph.D. .................................................. Northwestern University

Howard, Herbert J. (Emeritus), Ph.D. ................................. Ohio State University

Moore, Barbara A., Ph.D. ........................................... Ohio University

Swan, Norman R., Ph.D. .................................................... Missouri State University

Associate Professors:

Bates, Benjamin J., Ph.D. .............................................. Michigan State University

Wilkinson, Jeffrey, Ph.D. .............................................. Georgia State University

Luther, Catherine, Ph.D. ................................................ Minnesota State University

Assistant Professors:

Harmon, Mark D., Ph.D. ..................................................... Ohio State University

The Department of Broadcasting offers a concentration area for the master's with a major in Communications and participates in the interdisciplinary doctoral program. See Communications for additional information.

**GRADUATE COURSES**

440 Corporate Video (3) Special requirements of business, industrial, educational, and medical uses of video. Management, budgeting, planning, producing, and evaluating projects. PreReq: 450 or consent of instructor.


460 Broadcast News Operations (3) Production of new programs for broadcast on television stations. Electronic news gathering, editing, and writing news packages and studio production. PreReq: 410 or consent of instructor.

470 Cable Television and Emerging Technologies (3) History and structure of cable television industry. Analysis of cable television, fiber optics cable, high definition television, and others. PreReq: Introduction to Broadcasting or consent of instructor.


550 International Broadcasting (3) Broadcasting systems in other countries. Analysis of international broadcasting organizations. Interregional communication and international broadcasting. Development of communication and international broadcasting. PreReq: Consent of instructor.

560 Radio & Television Law and Regulations (3) Legal problems faced by broadcast managers. Analysis of regulatory policy formation. Efforts at law enforcement. Sociopolitical restraints, effects of laws and regulations, and public pressure on stations, networks, and cable operators. The unique situation of broadcasting among media in terms of regulations. PreReq: Consent of instructor or admission to program. 3 hrs.

570 Radio & Television Research (3) Various techniques used by stations and consultants in broadcast research. Applied audience research. Decision making. Which method to use, interpreting results, and applying research to management. Decision making. PreReq: Communications 512 or 515, or consent of instructor. 3 hrs.


597 Independent Study (3) PreReq: Consent of instructor. 3 hrs. E.

598 Internship (3) Full-time (30-40 hrs per week) work experience in radio, television, and cable. Prereq: Senior or graduate standing. Completion of at least 15 hrs of broadcasting courses GPA 3.0 or better, and consent of department head.

**Business Administration**

**(College of Business Administration)**

**MAJOR**

**DEGREES**

Business Administration ........................................... M.B.A., J.D.-M.B.A., M.S.-M.B.A., Ph.D.

The College of Business Administration offers two college-wide programs, the MBA and the Ph.D. with a major in Business Administration. Two tracks are available for the MBA: the regular, full-time program and the executive program.

The full-time MBA is for students seeking a full-time, weekday program that follows the traditional academic format. The nature of this program precludes students from simultaneously working full-time outside of school. In addition to the regular full-time program, there are two full-time dual-degree programs, the J.D.-M.B.A. offered by the College of Law and the M.S.-M.B.A. with the College of Engineering. Descriptions of these dual-degree programs follow the description of the regular, full-time program.

For students who wish to continue working full-time while they earn their MBA degree, there are four programs within the
executive track of the MBA. In these programs, students carry a full academic course load in addition to their full-time jobs. Each of these programs is designed to serve a different group of students. Descriptions of the MBA programs in the executive track follow the description of the dual-degree programs.

To obtain an MBA application, contact the MBA Program Office, 527 Stokely Management Center, College of Business Administration, The University of Tennessee, Knoxville, TN 37996-0552, Tel: (865) 974-5033, Email: mba@utk.edu. The application may also be downloaded from the website at http://mba.bus.utk.edu. For the executive or professional program, contact the Executive MBA Program Office, 704 Stokely Management Center, College of Business Administration, The University of Tennessee, Knoxville, TN 37996-0575, Tel: (865) 974-1660.

THE MBA PROGRAM

The full-time MBA program is designed for students with undergraduate degrees in the social and natural sciences, the humanities, and professional fields such as engineering, business, agriculture, and architecture. The MBA program is a two-year program with students beginning in the fall of each year and graduating in the spring, two years hence. During the summer between the first and second year, students must complete an internship with a company using those skills acquired during the first year of the MBA program.

The MBA program consists of a common first-year core and a wide selection of second-year concentration/elective courses. The first-year core develops a general management foundation upon which specialization is developed in the second year electives. The objective of the program is to prepare students for leadership positions in their organizations.

The program consists of two 15-credit-hour MBA core courses in the first year and 24 credit hours of concentration/elective courses in the second.

Admission Requirements

Applications are accepted for fall semester only. The application deadline for fall semester is March 1. Applications by U.S. citizens and permanent residents received after March 1 will be considered as space allows.

To be considered for admission, the applicant's file must be complete. A completed file includes the Graduate School Application, transcripts of prior college work, the MBA program application, two completed applicant recommendation forms, and the Graduate Management Admission Test (GMAT) score report. The first items should reach The Graduate School one month before the MBA application deadline to allow for processing. Additional information is required by The Graduate School for international students.

For admission to the MBA program, consideration is given to (1) applicant's academic record with particular attention to the last two years of undergraduate work and previous graduate studies, (2) scores on the GMAT and the Test of English as a Foreign Language (TOEFL) for those whose native language is not English, (3) work experience and other activities that demonstrate potential for leadership, and (4) recommendations from professors and work supervisors. The admission decision is based on all factors which make up the total application; therefore, there is no automatic cut-off for either grade point averages or GMAT scores. However, admission preference will be given to applicants with full-time work experience after obtaining the undergraduate degree.

Prerequisites

There are no specific course prerequisites for admission. However, undergraduate courses and work experience should demonstrate abilities with both qualitative and quantitative work. Those electing the management science or statistics concentration must have completed two years of college-level calculus.

MBA Core

The MBA core consists of two 15-hour courses, one taken each semester. The courses are taught by the MBA core faculty in an integrated fashion and through a year-long simulation required of students to learn the functional fundamentals (accounting, finance, management, marketing) when they need to apply them to solving a specific business problem. The topics introduced within this course follow three major themes: the functional fundamentals (learned within a cross-functional framework): the role of the firm in society (with attention to stakeholder value, economics, and the ethical/gLOBAL legal environment of the firm); and personal and team development. Students will be exposed to the assessment and delivery of customer value, statistical process control, continuous systems improvement, and the role of values in competitive organizations.

Students in the first-year core undertake active learning within a team-based environment. Many core requirements are experiential exercises in which self-discovery within a team setting is an important element of the learning process. Individualized support is provided for developing both written and oral communication skills.

Concentration and Electives

A concentration area may be indicated on the MBA Program Application or this declaration may be deferred until after matriculation. In any event, selection must be made after completion of the first year. Requests for changes in concentration area must be submitted for approval to the MBA Program Office. Among the 24 credit hours in the concentration/electives block, at least 9 but not more than 12 must be in one of the following concentration areas. For specific courses required in concentration areas, see the appropriate field of instruction.

Economics

Environmental Management

Finance

Forest Industries Management

Global Business

Logistics and Transportation Management

Manufacturing Management

Marketing

New Venture Analysis and Entrepreneurship

Statistics

The remaining elective courses must be in fields outside the concentration area, normally selected from MBA courses offered in other departments of the college. Courses outside the College of Business Administration as well as courses listed in the Graduate Catalog numbered below 500 may be included in this block only with written prior permission via formal petition to the MBA Program Office.

Transfer Credits

Graduate level courses taken at other institutions accredited by the American Assembly of Collegiate Schools of Business that otherwise conform to University policy may be credited toward MBA degree requirements within the following limits:

Concentration Area: 3 hours (provided at least 6 hours of work at this institution are included in the concentration area).

Elective Area: 3 hours

Because of the fully integrated nature of the first-year curriculum, no credit hours are transferred into this core curriculum. The minimum number of hours that may be transferred to elective and concentration areas is 6 semester hours. Transfer credit will be considered upon formal petition to the Dean of the MBA Program.

Other Requirements

The Application for Admission to Candidacy must be approved by two faculty members and the department head in the student's area of concentration and the Associate Dean in the College of Business Administration. It should be submitted to the Graduate Office at least one full semester prior to the date the degree is conferred. (Admission to candidacy in the fall semester permits graduation in the following spring semester.) To qualify for the degree, the student must achieve a B average (3.0) or above in MBA core courses required in his/her program or a B average or higher in courses comprising the concentration area, and a B average or higher in the overall program. Each student must write a satisfactory analysis of a comprehensive case administered at the end of the first year.

BUSINESS ADMINISTRATION CONCENTRATIONS

For complete listing of MBA program requirements, see above.


In recognition of the growing globalization of business activity and the importance of the international environment to successful management of every firm, the MBA program offers a concentration in global business. The concentration comprises at least two courses taken from Economics 424, Logistics 507, Management 571, and departmental special topics courses with international content; and at least one but not more than two additional courses from the previous list, or from a list of electives as approved by the Dean of the MBA Program. Students pursuing a concentration in global business are
strongly encouraged to pursue it as a second concentration in addition to one of the traditional departmental concentrations. Students pursuing this concentration are also strongly encouraged to pursue an international or internationally related internship for the summer between their first and second years in the MBA program. Students are expected to participate in a foreign exchange or field experience if at all possible, especially for those with no previous foreign experience. Language training is advised but not required, and beginning language courses are not typically available for graduate credit.

The concentration in new venture analysis and entrepreneurship is comprised of three specifically designed courses which are interdisciplinary in nature. This concentration strives to build a strong academic foundation for both entrepreneurial and intrapreneurial activities. The new venture analysis and entrepreneurship concentration is offered in recognition of the growing trend in American business today towards new product/venture development. The new venture analysis and entrepreneurship concentration courses may be combined with two elective courses in another area (management or marketing) to achieve a dual concentration.

Minimum course requirements are Finance 551, Management 551, and Marketing 550. These course descriptions are listed under their fields of instruction.

THE EXECUTIVE MBA PROGRAM

Each of the four programs of the executive track is designed to serve the needs of a different student group. The programs share a common course structure of 36 credit hours of classroom learning (BA 551, 552, 553) and 9 credit hours of projects applied within the student's business organization (BA 561, 562 and 563). Students carry a full, 15-credit-hour load each semester. In each program, all participants begin and complete the program together. The courses are functionally integrated, and the broad curriculum objectives are similar in each of the executive track programs. All are oriented toward applied learning and are highly interactive, making extensive use of experiential learning techniques. Emphasis and depth of subject material within the curriculum varies somewhat from program to program depending on the intended student group. All programs in the executive track result in the same Master of Business Administration degree as the full-time MBA.

Admissions Criteria: Primary consideration is given to the applicant's professional achievements and recommendations from the applicant's organization. Applicants must meet the minimum requirements of The Graduate School and submit transcripts of all undergraduate and graduate work. Applicants must graduate management admission test (GMAT) (some exceptions are noted within the specific program descriptions). No specific cut-off score exists for either grade-point averages or GMAT scores; however, admission is competitive, and applicants will be evaluated on their ability to operate on a par with other high achieving participants. Students whose native language is not English must take the test of English as a foreign language (TOEFL) unless they are U.S. citizens or have a degree from an accredited U.S. college or university. A minimum TOEFL score of 213 on the computer-based test is required for admission to the Graduate School.

Prerequisites: Although the program requires no specific course prerequisites for admission, undergraduate studies and professional experience should demonstrate ability with both qualitative and quantitative work.

Transfer Credits: Because of the nature of the executive track curricula, no credit hours may be transferred as substitutes for program curriculum.

Other Requirements: Other requirements are the same as those for the full-time MBA program.

Professional MBA Program

The professional MBA is provided for fully-employed managers within commuting distance of the University of Tennessee. The group of students for whom this program is designed has at least five years of work experience. The emphasis in this program is to provide a good grounding in the quantitative and qualitative tools of various business functions and a good basis in strategic thinking. Learning is expanded through applying these tools within the student's own organization through a structured project each semester. Each student project works with a team of faculty advisors. The Professional MBA is the right choice for individuals who wish to enhance their position within their organization by broadening their business knowledge beyond the functional area in which they are currently employed.

The professional program is three consecutive semesters completed in 16 months. Classes meet all day on Saturdays and occasionally on Friday evening and Sunday afternoon. The program begins in August with an intensive week of classes, then continues with weekend classes. The final fall semester also includes an intensive week of courses in addition to weekend classes. Graduation is in December.

Applications are accepted for fall semester only. The application deadline is April 15.

Executive MBA Program

The executive MBA is provided for a national audience of managers holding middle and upper level positions in organizations that support their attainment of an MBA degree. The students for whom this program is designed have at least 10 years of work experience and are currently in management positions. The emphasis in this program is to provide a good grounding in the fundamentals of various business functions and a good basis in strategic thinking. Learning is expanded through applying these tools within the student's own organization through a structured project each semester. Each student project works with a team of faculty advisors. The Executive MBA is the right choice for individuals who wish to enhance their position within their organization by broadening their business knowledge beyond the functional area in which they are currently employed.

The executive MBA is provided for a national audience of managers holding middle and upper level positions in organizations that support their attainment of an MBA degree. The students for whom this program is designed have at least 10 years of work experience and are currently in management positions. The emphasis in this program is to provide a good grounding in the fundamentals of various business functions and a good basis in strategic thinking. Learning is expanded through applying these tools within the student's own organization through a structured project each semester. Each student project works with a team of faculty advisors. The Executive MBA is the right choice for individuals who wish to enhance their position within their organization by broadening their business knowledge beyond the functional area in which they are currently employed.

The Executive MBA is three consecutive semesters completed in 12 months. The class meets in Knoxville for 8-day residence periods in January, April, August and December. Synchronous classroom periods are held each Saturday morning, and there are asynchronous internet learning sessions each week.

Applications are accepted for January entry only. The early application deadline is July 1, and the final application deadline is October 1. Applicants to the physician executive MBA are not required to take the GMAT test.

Physician Executive MBA

The physician executive MBA is provided for a national audience of physicians. The students for whom this program is designed have an M.D. or D.O. degree with five or more years of work experience. The curriculum objectives are the same as those for the executive MBA, but in the physician executive MBA many of the functional skills are taught in the context of the health care industry, and there is specialized content related to the health care environment. The physician executive MBA is the right choice for physicians who want to have a voice in the health care industry and in their own careers and are seeking a program that allows them to continue their practice while earning their MBA degree.

The Physician Executive MBA is three consecutive semesters completed in 12 months. The class meets in Knoxville for 8-day residence periods in January, April, August and December. The May residence period is extended through a business seminar of two weeks and is held in South America, Asia or Europe. Off-campus work includes synchronous computer classes and requires substantial and regular contact with faculty and other participants. The project work in the Physician Executive MBA is a large scale management project running throughout the year. Students work with managers in their own organizations to choose a project of significant scale and scope. Each student project has a faculty advisor.

Applications are accepted for January entry only. The early application deadline is June 1, and the final application deadline is September 15. Students will receive materials for study in mid-November preceding the January start date.

Taiwan Executive MBA

The Taiwan Executive MBA is provided for managers in Taiwan and East Asia holding middle and upper-level management positions. Classroom work and reading materials are in the English language. The students for whom this program is designed have at least five years of work experience and are currently in management positions. The emphasis in the Taiwan Executive MBA is to provide a good grounding in the fundamentals of various business functions and an understanding of strategic thinking. Learning is expanded through applying these tools within the student's own organization through a structured project each semester. The Taiwan Executive MBA is the right choice for individuals in positions of broad responsibility who wish to have a...
knowledge of Western business practices and to improve their ability to think and carry out business activities in English.

The Taiwan executive MBA is a three-year program completed in 19 months. Teams of UT faculty travel to Taipei for five 8-day residence periods, beginning in May of the first year. The sixth and final residence period is two weeks in length and is held in Knoxville. Between residence periods, students meet in regularly scheduled study classes to discuss project work and readings assigned for the next residence period. The project work in the Taiwan executive MBA is tied to the subject matter of each residence period.

Applications are accepted for May entry only. Taiwan executive MBA applicants are not required to take the GMAT. The application deadline is April 1. Students accepted into the program will receive materials for study proceeding the May start date.

An applicant who has not taken the Test of English as a Foreign Language (TOEFL) within the previous two years must take and pass it with a score of 213 or higher on the computer-based test or 550 or higher on the paper-based test, and must be successfully completed prior to the final residence period in Knoxville. To allow for registration, delivery of scores and receipt of the I-20 visa, participants should arrange to take the TOEFL at least 5 months before the Knoxville residence period.

PRE-MBA PROGRAM

The College offers a joint BA/MBA program with the College of Arts and Sciences. Students in this program take their first three years of coursework in Arts and Sciences, and their last two years in the College of Business Administration. Within their first three years, students fulfill all general education requirements for the BA degree, both upper and lower division along with a minor offered by one of the Arts and Sciences departments. They may use one Economics course only to fulfill distribution requirements, and they are required to take a year of calculus as the only prerequisite to the MBA.

Admission requirements are higher than those normally expected of MBA applicants. Desired qualifications include a minimum 3.4 GPA and a GMAT score of 600 or higher.

Students interested in the program are counseled initially in the Arts and Sciences Advising Center regarding admission standards and Arts and Sciences requirements. At the end of their second year, they have a conference with the Dean of the MBA Program and are advised of their prospects for formal admission. Students who are likely candidates are advised to take the Graduate Management Admission Test in October of the third year, and to submit an application to the MBA program. The admission decision is made by January of the third year.

Students begin MBA coursework in the fourth year and are awarded a BA degree at the end of that year. Upon successful completion of the fifth year (minimum of 30 semester hours of graduate credit), the student receives the MBA degree.

DUAL J.D.-MBA PROGRAM

The College of Business Administration and the College of Law offer a coordinated dual program leading to the conferral of both the Doctor of Jurisprudence and the Master of Business Administration. The dual program saves the student approximately one semester over the time that would be required to earn both degrees independently.

The establishment of the dual program recognizes the increasingly complex body of knowledge necessary to the creative conduct of business and business-related law practice, the complementary nature of many aspects of the graduate programs of the College of Law and the College of Business Administration, and the intellectual benefits inherent in the concurrent study of both business and business-related law. The program is designed to accommodate the interests of students who (a) contemplate a career in public service and want to acquire the skills and perspective of the lawyer and the business-oriented manager, (b) contemplate a career in business management and want to acquire the skills and perspective of a lawyer, or (c) contemplate a career as a lawyer specializing in business-related law and want to acquire the skills and perspective of the business-oriented manager.

Admission Requirements

Applicants for the J.D.-MBA program must make separate application to, and be competitively and independently accepted by, the College of Law for the J.D., The Graduate School and College of Business Administration for the MBA degree, and by the Dual Program Committee.

Students who have been accepted by both colleges must apply for approval to pursue the dual program anytime prior to, or after, matriculation in either or both colleges. Such approval will be granted, provided that dual program studies be started prior to entry into the last 28 semester hours of J.D. coursework and prior to entry into the second year of the MBA program. Students interested in entering the dual program should submit a letter of application to the Dual Program Committee. Upon receipt of the application, the Dual Program Committee will determine eligibility and assign students to advisors who will be responsible for course approval and supervision of the student’s progress through the dual program.

Curriculum

A dual program candidate must satisfy the graduation requirements of each college.

Students withdrawing from the dual program before completion of both degrees will not receive credit toward graduation from either college for courses in the other college, except as such courses qualify for credit without regard to the dual program.

The College of Law will award up to 9 semester hours of credit toward the J.D. for acceptable performance in approved graduate-level courses offered by the College of Business Administration. The College of Business Administration will award up to 9 semester hours of credit toward the MBA for acceptable performance in approved courses offered in the College of Law. The approval of courses is the responsibility of the Dual Program Committee and the student’s assigned advisor.

Students may begin their studies in either the J.D. or the MBA program but not enroll in MBA coursework while completing the first year of the law curriculum and may not enroll in J.D. coursework while completing the first year of the business curriculum. During the first year of the J.D. program, students register through the College of Law. For any term in which students take MBA courses, even though they are also taking law courses, they must register through the Graduate School. The Graduate School registration form must be approved by the Dean of the MBA Program.

Awarding of Grades

Grades for graduate business courses accepted by the College of Law and grades for law courses accepted by the College of Business Administration will be converted to either Satisfactory or No Credit and will not be included in the computation of the student’s grade average or class standing in the college in which such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular graded basis for any appropriate purpose in the college offering the course. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

Approved Dual Credit

MBA courses to be counted toward the J.D. program must include 9 semester hours approved by the College of Law. Law courses to be counted toward the MBA must be selected from those approved by the Dean of the MBA Program.

DUAL M.S.-MBA PROGRAM

The College of Business Administration and the College of Engineering offer a coordinated program leading to the conferral of the Master of Business Administration degree (concentration in manufacturing management) and the Master of Science degree with a major in Industrial Engineering (concentration in manufacturing systems engineering). The dual program saves the student one or two semesters over the time that would be required to earn both degrees independently.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate this increasingly complex body of knowledge in achieving the efficient operation of manufacturing and production firms. The program is designed to accommodate the interests of students who desire a career leading to a leadership position in a manufacturing organization.
Admission Requirements

Applications are accepted for fall semester only. Applicants for the M.S.-MBA program must make separate application to, and be competitively and independently accepted by, The Graduate School for the Master of Business Administration degree program and the Master of Science degree program with a major in Industrial Engineering, and by the Dual Program Committee. Students will initially apply for the MBA program, indicating on that application the intent to pursue the dual M.S.-MBA program in manufacturing engineering (refer to the MBA program for separate instructions). During the second semester of the first year, students will revise through The Graduate School to the M.S. program with a major in Industrial Engineering beginning Fall semester of the second academic year. Students accepted for both degree programs will be assigned by the Dual Program Committee advisors who will be responsible for course approval and supervision of the student's progress through the dual program. Applications by U.S. citizens and permanent residents received after the MBA application deadline (March 1) will be considered as space allows. Additional information is required, and different application dates are established by The Graduate School for international students.

Curriculum

The curriculum in the first academic year of the dual M.S.-MBA program is the two-semester core of the MBA program (two 15-hour courses, one each semester). In addition to the MBA core, three credit hours of a survey course in manufacturing systems engineering (IE 503) will also be taken during the first year (1 hour Fall semester and 2 hours Spring semester). A summer internship in industry will be accomplished between the two academic years.

During the second year, 27 hours of coursework will be completed in the manufacturing systems engineering concentration in Industrial Engineering plus an additional 9 hours of graduate courses in the College of Business Administration acceptable in meeting the requirements of the MBA program. Fifteen hours will be taken during each of the first two semesters of the second academic year. A culminating 6-hour integrated case study requiring use of most previous material, and a final examination as required by the Dual Program Committee, will be taken during the first session of summer term of the second year.

The dual degree candidate must satisfy the curriculum and graduation requirements of the Department of Industrial Engineering and the College of Business Administration acceptable in meeting the requirements of the MBA program. Fifteen hours will be taken during each of the first two semesters of the second academic year. A culminating 6-hour integrated case study requiring use of most previous material, and a final examination as required by the Dual Program Committee, will be taken during the first session of summer term of the second year.

The dual degree candidate must satisfy the curriculum and graduation requirements of the Department of Industrial Engineering and the College of Business Administration. Dual degree students withdrawing from the dual program before completion of both degrees will not receive credit toward graduation in either degree program for courses in the other degree program, except as such courses qualify for credit without regard to the dual degree program. The M.S. and the MBA degrees will be awarded upon successful completion of the requirements of the dual program.

Approved Dual Credit

A maximum of 6 semester hours of approved graduate-level courses completed in the College of Business Administration may be counted toward the M.S. degree program with a major in Industrial Engineering. A maximum of 15 semester hours of approved graduate-level courses completed in the Department of Industrial Engineering may be counted toward the MBA degree program. The approval of courses is the responsibility of the Dual Program Committee and the student's assigned advisor.

THE DOCTORAL PROGRAM

The primary objective of the Ph.D. in Business Administration is to prepare a select number of qualified students for careers in university-level teaching and research and for responsible positions in business and government.

Admission Requirements

Students seeking a Ph.D. degree must be recommended by the College of Business Administration to The Graduate School. Actual admission is based on the applicant's overall standing compared with other applicants and with the number of vacancies in each department. The Graduate School requires the Graduate School Application, transcripts from all previous college work, and additional information from international students. The college requires the Ph.D. application, scores from the GMAT, and four written recommendations. All materials should be received by the College of Business Administration not later than March 1. Late applications are considered only if space is available.

Under exceptional circumstances, a student may be considered for acceptance into the Ph.D. program without having a master's degree. An applicant in this situation should have an outstanding undergraduate background and should represent a deep and sincere commitment to the pursuit of a career in research and instruction.

Program of Study

The Ph.D. normally requires four years of intensive study and research beyond the master's degree. Typically, the first two years of a student's program consist of coursework, writing, and research. The third and fourth years require completion of courses, the comprehensive exam, and completion of the dissertation. It is emphasized that the Ph.D. program of study is structured for full-time students only. Upon acceptance of a student by a particular departmental faculty, the student is expected to remain in residence until the dissertation has been completed and all requirements are met for completion of the Ph.D.

Since the program focuses on the development of competent scholars, heavy emphasis is placed on both teaching and research skills. As such, each student is required to serve as a teaching assistant to a graduate class or as a research assistant to a senior faculty member. Students with strong teaching skills may be assigned their own classes. Typically, the College of Business Administration offers financial support for doctoral students during their tenure in the program.

The Ph.D. program is highly flexible, offering a wide array of concentrations and cognates. Moreover, heavy emphasis is placed on individualized instruction and close student-faculty interaction. Instruction takes the form of regular classes, doctoral seminars, and independent study and research. Students are encouraged to attend lectures and discussions by visiting scholars throughout the year.

There are six concentrations offered in the Ph.D. program:

- Accounting
- Finance
- Logistics and Transportation
- Management (Operations Management and Strategic Management)
- Marketing
- Statistics

More detailed information concerning these specific areas is available by writing directly to each department or by accessing the College of Business Administration web page.

Degree Requirements

Doctoral students must file a program of study that has been approved by their doctoral committee within one year of completing their first year of doctoral studies. This committee is nominated by the department chairperson in a student's intended area of concentration, subject to the Graduate Council's policies and procedures. Following are specific degree requirements:

1. Students must complete at least three years of full-time coursework beyond the baccalaureate degree, with two years of residence on the Knoxville campus.

2. Students are required to have a sound and broad base on which to build their Ph.D. coursework. The departmental doctoral advisor will work with the student to determine what, if any, courses need to be completed. All such work is subject to approval by the temporary doctoral advisory committee and the Dean of the MBA Program. Specific concentrations may have prerequisites.

3. Research Tools: A minimum of 9 semester hours of graduate research methods must be completed. All at least 6 semester hours in statistics courses beyond Statistics 531 are required. The remaining 3 semester hours may be completed in additional statistics courses (not to include Statistics 531) or in other areas such as research methodology, management science, computer science, econometrics, and psychometrics.

4. Concentrations: The concentration is the focal point of the Ph.D. program. Students are expected to master the literature and research techniques in the concentration area and to do quality research as evidenced by the preparation of an acceptable dissertation. A minimum of 12 semester hours of coursework is required, including at least 9 hours of doctoral seminars. Graduate work taken in the concentration at other institutions is considered by the temporary doctoral advisory committee in approving the specific coursework required. Available concentrations are: accounting, finance, logistics/transportation, management (operations management and strategic...
management), marketing, and statistics. See the appropriate fields of instruction for specific course requirements.

5. A minimum of 9 semester hours of graduate coursework is required in an area outside, but complementary to, the concentration. The student may choose the cognate from one of the following: one of the six concentration business areas listed above, economics, or a related area in another school or college of the University.

Comprehensive Examinations

Comprehensive written examinations over the concentration area are required of each person seeking candidacy for the Ph.D. degree. This examination is administered in two sessions of approximately four hours each. Students qualify in the cognate area by completing a one-session, four-hour examination or an equivalent jointly approved by the student’s major professor and the student’s advisor in the cognate area. Comprehensive examinations are generally offered during the fall and spring terms. Comprehensive examinations must be taken within five years of matriculation. When either the concentration or cognate area examination is passed, the remaining examination must be passed within the next 12 months.

Doctoral Committee

A doctoral student is advised to give serious attention early in the program to the composition of his/her doctoral committee. In accordance with Graduate School policy, the student and the major professor identify a doctoral committee composed of at least four faculty members, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. When the doctoral committee has been formed, the temporary doctoral advisory committee ceases to exist.

Admission to Candidacy

Students may apply for admission to candidacy for the Ph.D. after maintaining at least a "B" average in coursework, successful completion of comprehensive examinations, and acceptance of a research proposal for the dissertation by the student’s doctoral committee. Admission to candidacy must be approved at least one full semester prior to the date the degree is conferred. (Admission in the fall permits graduation in the following spring semester.)

Application for admission to candidacy must include a listing of all courses taken in each of the fields required for the degree (business functional areas, basic disciplines, concentration and cognate area). Graduate courses accepted from other institutions must be included. Under "Other Requirements," the date of acceptance of the research proposal by the doctoral committee should be indicated. The application must be approved by the student's doctoral committee and the Associate Dean before submission to The Graduate School.

Dissertation

Minimum of 24 semester hours: The student must complete a dissertation embodying the results of original research demonstrating the ability to do scholarly writing. The dissertation is supervised by the candidate’s doctoral committee, which must certify its completion and acceptability after oral defense of the candidate’s research effort.

The dissertation normally must be completed within three years of the student’s advancement to candidacy.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state basis. The Ph.D. in Business Administration is available to residents of Alabama, Florida, Kentucky, or West Virginia; the MBA is available to residents of Alabama, Florida, Kentucky, Louisiana, Texas, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

ACADEMIC STANDARDS

A graduate student in the College of Business Administration whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next semester’s coursework as established by the degree program.

GRADUATE COURSES

502-03 Business Core for Master of Accountancy I, II, and III (3) Development of role and responsibility of accountant as business advisor. Assessment and delivery of customer value, continuous system improvement, statistical process control, human resource management, role of quality in competitive organizations, performance measurement, financing, and overall corporate strategy. Prereq: Admission to M.Acc. program.

504 Core I (15) Development of roles and responsibilities of business manager. Fundamental concepts (accounting, finance, marketing, operations, human resource management) required for year-long case in which knowledge is applied to the operations of a simulated real-world enterprise. Continuous systems improvement and delivery of customer value: role of firm in society (with attention to stakeholders, economics, and the ethical and legal environment of firm). Personal development for leadership. Team-building, written and oral communication, and assessment of student leadership abilities. Prereq: Admission to MIB program or consent of Dean of the MBA Program.

505 Core II (15) Continuation of 504. Functional fundamentals through year-long case. Case-study work on an organizational reality, global competition, managing technology, ethics and social responsibility, and strategic planning. Cappstone integrated business simulation. Prereq: 504 or consent of Dean of the MBA Program.

506 Information Infrastructure Strategy and Design (3) Information strategy involving structured and unstructured systems, using internet and internet networks. Design of structured systems using CASE tools. Unitary systems are now being applied strategically with internet access with access control.

510 Customer Responsive Management (3) Management methods that provide flexibility required to respond to diverse customer needs and to adapt to competitive, technological, and operational change. Mass customization, interactive marketing, capacity management, economics, and relationship management for industries: health care, consulting, temporary services, professional services, repair services, truck load transportation, emergency response organization.

John R. Collier, Head
The minimum requirements are 18 courses in chemical engineering and related requirements for completion of the non-thesis application individually. Upon acceptance, the student must register for ChE 501 every semester it is offered.

The DOCTORAL PROGRAM

Students applying for entrance into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the department. The master's thesis may be offered as such evidence.

Department requirements consist of the satisfactory completion of:

1. Graduate courses in chemical engineering, amounting to approximately 24 semester hours, at least 9 of which must be in 600 series courses.
2. Supporting courses in related scientific and engineering fields amounting to approximately 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include chemistry, mathematics, physics, and engineering.
3. The comprehensive examination, consisting of a written part and an oral part. The written part covers thermodynamics, reactor analysis, and transport phenomena and separations.
4. Active participation in graduate seminars conducted by the department. Resident students must register for ChE 501 every semester offered.

GRADUATE COURSES

403 Introduction to Optimization (3) Principles and applications of optimization techniques to chemical process design; unconstrained and constrained optimization, linear programming, dynamic programming, and geometric programming. Prerequisites: Mathemat 241.


477 Honors: Engineering Internship in Process Control (4) Selected students work in small groups on industrial problems in process dynamics and control. Directed by faculty and engineers from host company. Prerequisites: Dynamics of Control and Consent of Instructor.

477 Honors: Applied Process Automation Laboratory (3) Interfacing flexible batch continuous processes to automation systems. Top-down analysis with bottom-up implementation, hierarchical structures and object oriented concepts used to design automation solutions: human-machine-interfaces. Workstations with modern industrial equipment, interactive graphics and visualization environment. Prerequisites: Process Dynamics and Control and Consent of Instructor.


485 Hydrocarbon Processing (3) Chemical and physical properties of selected petroleum and those processes utilized in conversion of raw material into various fuels and selected chemical feedstocks. Prerequisite: Thermodynamics and Separation Processes, Organic Chemistry.

500 Thesis (1-15) S/N only. E

501 Graduate Seminar (1) Prerequisite: Admission to graduate program. May be repeated. S/N only. F, Sp

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses university facilities. Instructors require time before department or degree completed. May not be used toward degree requirements. May be repeated. S/N only. E

505 Engineering Analysis (3) Formulation and solution of problems in chemical engineering and materials areas, ordinary and partial differential equations; types of ODE, PDE and solution techniques; transform methods; conformal mapping; variational methods; introduction to numerical methods. (Same as Materials Science and Engineering 505.)

507 Application of Linear Algebra in Engineering Systems (3) Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems, Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalues and eigenvectors, solving difference and differential equations; numerical stability aspects of linear algebra problems. Application of linear algebra concepts to control and optimization studies; introduction to linear programming and computer methods. Prerequisites: Graduate standing or consent of instructor. (Same as Electrical Engineering 507 and Mechanical Engineering 507.)

531 Advanced Chemical Engineering Thermodynamics (3) Phase equilibrium in ideal and nonideal solution; composition relationships between phases, phase behavior and phase diagrams; macromolecular thermodynamics; microscopic approach to thermodynamics. F

532 Statistical Mechanics (3) Molecular distribution functions, molecular simulations, diagrammatic expansions, distribution function theory, perturbation theory, time-dependent correlation functions, theory of transport processes, and phase transitions. Prerequisites: 531, Sp

541 Fluid Mechanics and Polymer Processing (3) (Same as Materials Science and Engineering 541.)

542 Diffusive and Stagewise Mass Transfer Operations (3) Analysis of mass transfer phenomena, coupled mass transfer and reaction, mass transfer operations in packed towers and agitated vessels, membrane separations. Engineering concepts applied to mass transfer operation, emphasizing nonisothermal and multicomponent systems.

547 Introduction to Transport Phenomena (3) Unified treatment of mass, momentum, and heat transfer. Differential and macroscopic balances in deriving governing equations. Anomalies between processes. Use of dimensionless approach in scaling systems up or down. Applications involving jet and annular flows. F

551 Chemical Reactor Analysis (3) Rate models for heterogeneous reactions, properties of porous catalysts, catalytic deactivation, fluid-fluid and fluid-solid reactors.

561 Process Modeling and Simulation (3) Theories and structures of models and art of simulation. Model development from basic principles. Model development from plant test. Use of models in operations, optimization and control. Prerequisite: Consent of Instructor.

575 Applied Microbiology and Bioengineering (3) Conventional course covering basic concepts in microbiology, biochemistry, reaction kinetics, and biochemical and environmental engineering. Processes: biodegradation, wastewater treatment, analysis of biomass reactors, bioreactors, and immobilization methods. Fundamental laboratory techniques during one-week laboratory period. (Same as Environmental Engineering 575, Biosystems Engineering 575 and Microbiology 575.)

580 Technical Review and Assessment (3) Preparation of critical review of literature in area related to

Graduate programs lead to the degrees of Master of Science and Doctor of Philosophy in Chemical Engineering with concentrations in chemical engineering, chemical biotechnology, advanced control systems, and polymer science and engineering.

THE MASTER'S PROGRAM

Thesis Option: The standard master's program includes a thesis and leads to the Master of Science. Minimum departmental requirements are as follows:

1. A total of at least 21 hours in graduate coursework in chemical engineering and related areas excluding thesis. The minimum requirements are 15 hours in chemical engineering, 3 hours in other engineering, and 3 hours chosen from either of these two categories.
3. Active participation in graduate seminars in the department. Resident students must register for ChE 501 every semester it is offered.
4. A final oral examination covering the thesis, related fields and graduate coursework.

Non-Thesis Option: Under certain conditions, a candidate may apply for a non-thesis program. To be eligible, a candidate must show evidence of significant professional experience after the baccalaureate degree; at least five years of industrial experience or research publications would be examples of such evidence. The departmental faculty will consider each application individually. Upon acceptance, the requirements for completion of the non-thesis option are as follows:

1. A total of at least 33 hours in graduate courses in chemical engineering and related areas. The minimum requirements are 18 hours in chemical engineering, 6 hours in other engineering, scientific, or business areas (as approved by the department faculty); and 9 hours chosen from either of these two categories.
2. Completion of a critical review of the literature and other sources in an area related to chemical engineering (ChE 500).
3. A written comprehensive examination covering the major field and an oral examination covering the review paper and related areas.
Chemistry

(College of Arts and Sciences)

MAJOR

DEGREES

Chemistry ........................................ M.S., Ph.D.

Michael Sepaniak, Head

Professors:

Adcock, J. L., Ph.D. ......................... Texas
Alexandros, S. D. (Hoechst Celanese)
Prof. of Polymer Science), Ph.D. California
Baker, D. C. (Paul and Wilma Ziegler Prof.),
Ph.D. ................................................ Ohio State
Bartmess, J. E., Ph.D. ....................... Northwestern
Bloor, J. E. (Emeritus), Ph.D. ............... Manchester
Bull, W. E. (Emeritus), Ph.D. ............... Illinois
Compton, R. N., Ph.D. ...................... Tennessee
Cook, K. D., Ph.D. ............................ Wisconsin
Dean, J. A. (Emeritus), Ph.D. ............... Michigan
Eastham, J. F. (Emeritus), Ph.D. ........... California
Felderle, C. S., Ph.D. ................. Colorado

Fletcher, W. H. (Emeritus), Ph.D. ........ Minnesota
Grimm, F. A. (Emeritus), Ph.D. .......... Cornell
Guichon, G. (Distinguished Scientist),
Ph.D. ............................................ Ecole Polytechnique
Paris VI
Kabalka, G. W. (Robert H. Cole Prof,
Distinguished Prof.), Ph.D. ............ Purdue
Kleinfeinle, D. C. (Emeritus), Ph.D. .... Princeton
Kovac, J. D., Ph.D. .......................... Tennessee
Lietzke, M. H. (Emeritus), Ph.D. ......... Wisconsin
Magid, L. J., Ph.D. ........................... Texas
Pagni, R. M., Ph.D. .......................... Wisconsin
Peterson, J. R. (Emeritus), Ph.D. ........ California
Schweitzer, G. K. (Distinguished Prof.),
Ph.D. ........................................ Illinois
Seppanen, M. J., Ph.D. ..................... Iowa State
Strank, W. A. (Paul and Wilma Ziegler
Prof.), Ph.D. ................................. Johns Hopkins
Turner, J. Ph.D. .............................. Oxford
Woods, C. III, Ph.D. ...................... NC State
Wunderlich, B. (Distinguished Scientist),
Ph.D. ........................................ Northwestern

Associate Professors:

Barnes, C. E., Ph.D. ....................... Stanford
Scholl, F. M., Ph.D. ......................... Indiana
Xue, Z. B., Ph.D. .............................. California

Assistant Professor:

Dadmun, M. D., Ph.D. ...................... Massachusetts
Gilmans, S. C., Ph.D. ....................... Penn State
Hindes, Robert J., Ph.D. ................. Chicago
Tumer, J. Ph.D. ............................ Ohio State
Young, D. G., Ph.D. ....................... Ohio State

Walter, D. E., Ph.D. ......................... University of California, Berkeley

Students majoring in Chemistry for the master's or doctoral degree are required to present as a prerequisite one year each of general, theoretical, and organic chemistry with a satisfactory record. At least one-half year of inorganic chemistry is also recommended. Students lacking any of these prerequisites may be admitted with appropriate deficiencies that must be removed without graduate credit. Applicants are required to take the general Graduate Record Examination.

Students minoring in Chemistry are required to present as a prerequisite two years of chemistry including quantitative analysis.

THE MASTER'S PROGRAM

The department offers concentrations in six areas for the M.S.: analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, polymer chemistry, and physical chemistry.

The requirements for the M.S. in Chemistry consist of the satisfactory completion of:

1. Research and a thesis to give at least 24 hours of graduate credit in Chemistry 601.
2. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 520-21-22, 550-51-52-53-54, 570-71-72-73-74, 580-60-61.
3. A final oral examination.

THE DOCTORAL PROGRAM

The department offers concentrations in eight areas for the Ph.D.: analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, polymer chemistry, and physical chemistry.

The requirements for the Ph.D. in Chemistry (except for the chemical physics concentration) consist of the satisfactory completion of:

1. Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 601. Registration must be continuous from the beginning of research.
2. Participation in seminar (Chemistry 501) during the entire period of graduate study, including the presentation of at least one seminar.
3. Prescribed remedial courses based on performance on entrance examinations.
4. Completion of the comprehensive examination series and defense of an original research proposal to give 2 hours of credit in Chemistry 601.
5. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 520-21-22, 550-51-52-53-54, 570-71-72-73-74, 580-60-61.
6. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department. Chemistry department graduate requirements include passing the above degree requirements in chemistry with concentration in physical chemistry plus 6 additional hours in physics at the 500 level or above. Three of the additional physics hours can be used to satisfy the 18 hours requirement in item 5.

GRADUATE COURSES

430 Advanced Inorganic Chemistry (3) Atomic and molecular structure, bonding theories, descriptive chemistry of elements, kinetics and mechanism of inorganic reactions, applications of modern techniques for characterization, coordination, and organometallic chemistry. Prereq: 230 Inorganic Chemistry. Sp


471-81 Biophysical Chemistry (3,3) (Same as Biochemistry and Cellular and Molecular Biology 471-81.)

473-83 Physical Chemistry (3,3) Students may not receive credit for both 471 and 473 nor for both 481 and 483. 473-83 Properties of gases; first, second, and third laws of thermodynamics; chemical equilibria; simple phases; electrical properties of solutions; introduction to statistical thermodynamics. 483-83 Kinetics of chemical reaction; introduction to quantum mechanics and applications to electronic structure of atoms and molecules; molecular spectroscopy. Prereq: General Chemistry, Elements of Physics or Fundamentals of Physics: Electricity and Magnetism, and Calculus III. F, Sp

479-89 Physical Chemistry Laboratory (2,2) Experiments on topics discussed in 471-81 or 473-83.
554 Organic Spectroscopy Laboratory (1) Use of IR, UV, MS and multinuclear FT NMR spectrometers. Development of problem-solving ability in area of spectroscopic characterization of organic molecules. Prereq: 300 or equivalent. Coreq: 553. F

570 Quantum Chemistry and Spectroscopy (3) Basic principles of quantum mechanics and their applications to molecular orbital theory, molecular structure, and spectroscopy. Introduction to group theory. Required background: Two semesters of physical chemistry. F

571 Advanced Quantum Chemistry and Spectroscopy (3) Prereq: 570 or consent of instructor. Sp

572 Thermodynamics and Statistical Mechanics (3) Microscopic and macroscopic description of equilibrium systems. Basic principles of thermodynamics and statistical mechanics, and application to selected chemical systems. Required background: Two semesters of physical chemistry. F

573 Chemical Kinetics and Transport (3) Time-dependent phenomena in chemistry; chemical kinetics, chemical dynamics, transport theory. Required background: Two semesters of physical chemistry. Sp

580 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles. Required background: Two semesters each of organic and physical chemistry. F


595 Physical Chemistry of Polymers (3) Conformation of macromolecules, solution and bulk properties, rubber elasticity, kinetics of polymerization, polymer thermodynamics. Prereq: 590 or equivalent. Sp

601 Chemistry Research Proposal (2) Preparation and oral defense of original written research proposal based on thorough survey of chemical literature. Prereq: Consent of department head. S/NC only. E

610 Selected Topics in Analytical Chemistry (3) Topics of current significance. Prereq: 510-11-12 or consent of instructor. May be repeated. Maximum 12 hrs.

620 Selected Topics in Inorganic Chemistry (3) Topics of current significance. Prereq: 530-31-32 or consent of instructor. May be repeated. Maximum 12 hrs.

650 Selected Topics in Organic Chemistry (3) Topics of current significance. Prereq: Two of 550-51-52 or consent of instructor. May be repeated. Maximum 12 hrs.

670 Selected Topics in Physical Chemistry (3) Topics of current significance. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

690 Selected Topics in Polymer Chemistry (3) Topics of current significance. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

Child and Family Studies

(College of Human Ecology)

MAJORS

Child and Family Studies ......................... M.S. in Human Ecology ......................... Ph.D.

Ernest W. Brewer, Head

DEGREES

Child and Family Studies ........................ M.S. in Human Ecology ......................... Ph.D.

Ernest W. Brewer, Head

Professors:
Blanton, Priscilla, Ed.D. ............................... Tennessee
Buehler, Cheryl, Ph.D. ................................. Minnesota
Cunningham, Jo Lynn, Ph.D. ........................ Michigan
Fox, Greer Litton, Ph.D. ............................... Michigan
Moran, James D., Ph.D. .............................. Oklahoma State
Nordquist, V. Mack, Ph.D. ............................ Tennessee
Steele, Connei (Emeritus), Ed.D. ........................ Texas Tech

Twardosz, Sandra, Ph.D. ............................. Kansas

Associate Professors:
Allen, Jan, Ph.D. ............................. Purdue
Malia, Julia, Ph.D. ................................. Iowa State
Morris, Lane, Ph.D. ................................. Tennessee
Smith, Delores, Ph.D. ............................... Oklahoma State
Tegano, Deborah, Ph.D. ............................ Virginia Tech

Assistant Professors:
Catron, Carol, Ph.D. ................................. University of Texas

Groves, Melissa, Ph.D. ............................... Virginia Tech

The Department of Child and Family Studies provides coursework in human development and family studies. Integration of these areas creates a unique perspective for the study of individuals and families. Each graduate student's program of study is carefully planned in conjunction with a faculty committee to establish a program consistent with program requirements and a student's individual goals. All programs are characterized by a broad array of coursework, varied research experiences, and opportunities for experiences in applied settings.

ADMISSION REQUIREMENTS

A complete file for review includes a departmental application, Graduate Record Examination (GRE) scores for the general section, and completion of three Graduate School Rating Forms by individuals who can attest to the applicant’s potential for graduate education. Forms may be obtained from the department or Dean's Office, College of Human Ecology.

Admission to the program is contingent upon faculty evaluation of GRE scores, undergraduate/graduate GPA, rating forms, work experience, and the match between student's goals and department's focus.

Prerequisites for admission to the master's program are 9 semester hours of upper division undergraduate social science.

Prerequisites to the doctoral program are a master's degree from a regionally accredited institution or equivalent, completion of the 18 hour core in the CFS master's program (or appropriate substitutions), 3 hours of computationally-based, graduate-level statistics, 3 hours of graduate-level research methods, and completion of a thesis as part of the master's degree. The department provides a remedial mechanism for doctoral students who have earned a master's degree but have not met the other prerequisite requirements.

THE MASTER'S PROGRAM

The Master of Science degree with a major in Child and Family Studies provides a broad foundation in the understanding of how children develop and how families function in today's society. Two concentra-
tions are available in child and family studies or in early childhood education.

Child and family studies requires a minimum of 36 credits of coursework: 18 credits in core coursework and 18 credits in specialization. Core requirements are: 510, 511, 540, 550, 552, and 562. Students then choose either the thesis option (research) or the non-thesis option (practice; internship and comprehensive exam required).

Students who plan to pursue a doctoral degree are advised by selecting the thesis option. The following are required in the thesis option: 570, Statistics 531 or 537, and 6 credits of Thesis 500. Students who plan to work with children and families in the community are best served by selecting the non-thesis option. Specializations within the practice option include: child and family life practice, family mediation, gerontology, child and family policy, families of children with disabilities, and child and family program administration. Each of these specializations includes 6 credits of specified relevant coursework. Core coursework required for specialization includes (564 and 565). Specific coursework within each specialization is on file in the Department of Child and Family Studies. Interested students should contact the Graduate Coordinator in Child and Family Studies.

The early childhood education concentration is designed for students seeking initial teacher licensure in early childhood education (Pre-K through Grade 3). This program is based on an undergraduate degree in child development or equivalent coursework. A non-thesis option only is available. All students in the early childhood education licensure program must enroll in Human Ecology 574, 575, 591, and Holistic Teaching/Learning 505 (or equivalent Child and Family Studies course). Students select 3 hours from 510, 511 or 512, three courses from 511, 520, 521, 522, 525, 530, 540, 590; 3 hours of 500-level statistical methods or interpretation of statistics or research methods (requirement may be met with 563); and written comprehensive examination (36 credits).

Students seeking the M.S. with a major in Child and Family Studies must file a plan of study with the department head prior to 12 hours of graduate credit.

THE P.H.D. CONCENTRATION

The department participates in the doctoral program with a major in Human Ecology, concentration in child and family studies. Two themes are highlighted: the integration of human development and family studies and concentration in a selected area of study. A doctoral program that is concurrently specialized and integrative in nature reflects the complexity of the disciplinary subject matter, provides a broader context to formulate theoretical questions, and broadens the empirical literature for addressing those questions.

Requirements include:
2. Completion of the doctoral core: 640, 634, 651, or 652.

5. Three credits of advanced statistics.
6. Minimum 3 credits in specialized research methods.
7. Selection of one of the following specializations: teaching in higher education (requires UT GTA seminar, 3 credits of college teaching methods, and one semester of supervised teaching experience); administration in community services (requires 566 or 563, 521 or HRD 512 or SW 541, and one semester of an administrative apprenticeship); research emphasis (requires 6 additional credits in research methods or statistics).
8. Minimum of 6 credits in a cognate area.
10. Minimum of 66 credits beyond the bachelor's degree.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any term when the graduate is enrolled in one of the required courses, and/or has not completed the required coursework. May not be used toward degree requirements. May be repeated. SNC only. E

505 Development of Interpersonal and Supervision Skills (3) Required for students seeking initial teacher licensure in early childhood education (Pre-K through Grade 3). This program is based on an undergraduate degree in child development or equivalent coursework. A non-thesis option only is available. All students in the early childhood education licensure program must enroll in Human Ecology 574, 575, 591, and Holistic Teaching/Learning 505 (or equivalent Child and Family Studies course). Students select 3 hours from 510, 511 or 512, three courses from 511, 520, 521, 522, 525, 530, 540, 590; 3 hours of 500-level statistical methods or interpretation of statistics or research methods (requirement may be met with 563); and written comprehensive examination (36 credits).

Students seeking the M.S. with a major in Child and Family Studies must file a plan of study with the department head prior to 12 hours of graduate credit.
Civil and Environmental Engineering

(College of Engineering)

MAJORS DEGREES

Civil Engineering M.S., Ph.D. Environmental Engineering M.S., Ph.D. (Ph.D. through Civil Engineering)

Gregory D. Reed, Head

Professors:


Heathington, K. W. (Emeritus), Ph.D. Humphreys, J. B. (Emeritus), Ph.D. Johnson, H. L. (Emeritus), M.S. .......... Tennessee Miller, W. A. (Granger Prof.), PE, Ph.D. .......... Georgia Tech

Reed, G. D. (Liaison), PE, Ph.D. .......... Arkansas Robinson, R. B. (Fisher Prof.), PE, Ph.D. .......... Iowa State

Smool, J. L., PE, Ph.D. .......... VPI Tschantz, B. A. (Condra Prof.), PE, So.D. .......... New Mexico State


Associate Professors:


Assistant Professor:

Jackson, N. M., PE, Ph.D. .......... Oregon State

The Department of Civil & Environmental Engineering offers degrees leading to the Master of Science and Doctor of Philosophy with a major in Civil Engineering concentrating in construction engineering, environmental engineering, geotechnical/materials engineering, public works engineering, structural engineering, and transportation engineering; to the Master of Science in Environmental Engineering with concentrations in water quality, water resources, air quality, mixed waste management, and environmental risk assessment.

THE MASTER'S PROGRAM

The Master of Science programs in Civil Engineering and Environmental Engineering are offered to graduates of recognized undergraduate curricula.

Thesis Option: A minimum of 30 semester hours, including 6 hours of thesis, is required. Non-Thesis Option: A minimum of 33 semester hours, including a 3-hour special problem is required. The special problem will culminate in a written report which must be approved by the student's major professor.

Civil Engineering

The Department of Civil and Environmental Engineering offers two options for the Master of Science with a major in Civil Engineering.

Thesis Option: A minimum of 30 semester hours, including 6 hours of thesis, is required. Non-Thesis Option: A minimum of 33 semester hours, including a 3-hour special problem is required. The special problem will culminate in a written report which must be approved by the student's major professor.

Environmental Engineering

For a Master of Science with a major in Environmental Engineering, normally a Bachelor's degree in a field of engineering is required. For a student who does not have an engineering background, the following minimum prerequisites courses are required: Engineering Fundamentals 101, 102; Nuclear Engineering 203 or Mechanical Engineering 331; Basic Engineering 121, 131; Engineering Science and Mechanics 231; Statistics 251; Civil Engineering 390, 395, 380; Mathematics 141, 142, 231, 241; Chemistry 120, 130. In general, these must be completed with a B average before courses for graduate credit can be taken.

The Department of Civil and Environmental Engineering offers both thesis and non-thesis options for work toward the Master of Science degree in Environmental Engineering.

Thesis Option: The student must present a minimum of 30 semester hours of approved graduate courses. The major shall include 6 semester hours of thesis and a minimum of 12 semester hours of approved environmental engineering coursework. A minor may be selected but is not necessarily required.

Non-Thesis Option: The student must present a minimum of 33 semester hours of approved graduate courses. The major shall include a minimum of 16 semester hours of approved environmental engineering coursework. A minor may be selected but is not necessarily required.

Either option must be approved by the student's major professor. A student's program must include a minimum of 9 semester hours of advanced engineering design courses selected from a list provided by the student's committee.

Normally, the graduate program of study will be approved by the head of the department and the student's committee to suit the individual academic objectives.

THE DOCTORAL PROGRAM

A graduate program leading to the Doctor of Philosophy is offered in Civil Engineering. Specific departmental requirements for the Ph.D. degree include the following:

1. A minimum of 72 semester hours beyond the Bachelor's degree, exclusive of credit for the M.S. thesis. Of this number,
Civil Engineering

GRADUATE COURSES

421 Portland Cement Concrete Mix Design and Analysis (3) Aggregate and binders tests of asphalt, bitumen, and nondestructive testing. Prereq: 321, 3 and 1 hr and 1 lab.

451 Highway Engineering (3) Design, construction, operation, and maintenance of highway facilities; application of various engineering principles and techniques to process of planning, locating and design of highway facilities; both geometric and pavement design. Prereq: 210, 251, 232.

452 Traffic Engineering (3) Characteristics of driver, vehicle, and roadway and their interaction; traffic studies; basic considerations of traffic circulation and control; lighting, capacity analysis, roadway safety analysis and design. Prereq: 210, 251, 332.

453 Airport/Railroad Planning and Design (3) Airport master planning and railroad engineering; runway configuration, airfield capacity, geometrics, terminal layout, and design. Railroad capacity, geometrics and system layout and design. Prereq: 210, 251, 332.

461 Analysis of Framed Structures (3) Determination of dead, live, wind and earthquake loads for buildings; vertical and lateral load resisting systems; analysis of building frames. Prereq: Structural Analysis II.

472 Steel Design (3) Design of plate girders and composite beams; consideration of members subjected to combined stresses; design of typical framed buildings. Prereq: 471.

474 Reinforced Concrete Design (3) Design of continuous beams and columns with combined axial loads and bending, foiling; and design for torsion. Prereq: Introduction to Structural Design.

485 Principles of Hydrogeology (3) (Same as Geological Sciences 485).

490 Water Resources Project Design (3) Coherent development of multipurpose reservoir, dam, and project; data acquisition, spillway, and outlet works design; earth and gravity dam stability analyses; drains and filters; maintenance and operation principles; and dam safety concepts. Prereq: 390, 395.

495 Water Resources Development and Management (3) Principles of water resources project development, planning, and management. Institutional framework: water law, evaluation procedures for comparing and selecting among water resources development alternatives; multi-objective planning; principles of engineering economics; benefit-cost analysis; and cost allocation methods; environmental impact assessment procedures; decisions using risk-based methods; case studies. Prereq: Senior standing.

500 Thesis (1-15) Final only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only.

510 Urban Systems: Engineering and Management (3) Various urban systems usually under responsibility of city manager and/or city engineer: streets, lighting, water, sewerage, refuse collection. Personnel management, finance, public relations. Prereq: Graduate standing or consent of instructor.


522 Asphalt Concrete Mix Design and Analysis (3) Aggregate properties and tests, tests of asphalt and asphalt concrete mixes, mix design methods for asphalt concrete, production and placement of hot mix asphalt. Prereq: Materials of Construction. 2 hrs and 1 lab.


531 Soil Stabilization (3) Mechanical stabilization of soils by compaction, drainage, and bending; stabilization of soils with admixtures, waterproofing, and modifying soils and additives. Reinforced earth stabilization and geosynthetics. Prereq: Introduction to Soil Behavior.

532 Rock Mechanics and Rock Engineering (3) Engineering properties and characterization of rocks and rock masses. Discontinuity analysis, stress and strain, key block theory. Applications to rock slopes and underground excavations. Foundations and ground water flow. Prereq: Introduction to Soil Behavior or consent of instructor.

534 Geological Engineering (3) Influence of geologic origin and history on engineering characteristics of rocks and soils. Application of geology in planning, design and construction of civil engineering projects. Prereq: Introduction to Soil Behavior 2 hrs and 1 lab.


537 Issues in Geotechnical Engineering (1-3) Special readings, problems, discussions, and presentations in geotechnical engineering. Prerequisite: Graduate standing or consent of instructor. May be repeated.

538 Finite Element Applications in Geotechnical Engineering (3) Applications of finite element method to typical problems in geotechnical engineering. Continuum and nonlinear problems. Axial, bending, torsion stresses and strains in elastic, plastic, and elasplastic behavior considered for structures systems; earthquake and dynamic analysis.

540 Construction Management I (3) Management and organization of heavy and building construction projects. Prereq: Construction Methods and Equipment.

541 Construction Management II (3) Management organization of heavy and building construction projects. Prereq: Construction Methods and Equipment.

543 Construction Estimating (3) Project cost, estimating for tender, market cost conditions, and feasibility of design to cost. Prereq: Construction Methods and Equipment.

551 Traffic Engineering-Characteristics (3) Driver-vehicle-roadway system; traffic flow modeling; elements of transportation/human safety. Prereq: Graduate standing.

552 Traffic Engineering-Operations (3) Signs, signals, and markings; short-term operating conditions; signal timing; one-way reversible flow; system operations; identification and correction of high-accident locations and system deficiencies. Prereq: 451 or consent of instructor.

555 Public Transit Planning (3) Characteristics of transit modes—conventional and paratransit; operational design of transit services; route planning, vehicle scheduling; cost analysis models; performance evaluation; transit surveys; organization and financing. Prereq: 554 or graduate standing.

556 Traffic Accident Reconstruction (3) Data collection and analysis as basis for accident prevention on control programs; roadway design and traffic control. Prereq: 452 or graduate standing.

557 Transportation Planning and Operations with Micro-Computer Applications (3) Transportation system management techniques and application of microcomputer for analysis of transportation actions. Prereq: 551 and 556.

558 Planning and Transportation (3) Preparation transportation as elements of comprehensive development plans. Analysis of relationship between various transportation modes and urban transportation systems; theoretical and practical aspects. Prereq: 551 or 452.

561 Computer-Aided Structural Analysis (3) Fundamental concepts of computational methods used in structural analysis; matrix and finite element methods; practical application of matrix structural analysis; finite element methods. Prereq: Structural Analysis II.

562 Structural Systems (3) Structural system analysis and design; design of structures; analysis of systems; computer-aided analysis and design. Prereq: Introduction to Structural Design.

563 Statically Indeterminate Structures (3) Elastic analysis of indeterminate elastic and rigid frames with distributed loads; deflection, and moment distribution methods; plastic analysis of rigid frames; and stability analysis of composite members and portal frames. Prereq: Structural Analysis II.

565 Structural Dynamics (3) Analysis of free and forced vibrations, and transient response of structures having many degrees of freedom; elastostatic behavioral behavior considered for structural systems; earthquake...
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Special Topics in Civil Engineering (1-4) Problems and topics related to current design and research field. May be repeated. Prereq: Consent of instructor.

504 Doctoral Research and Dissertation (1-15) Prereq: Graduate standing. May be repeated. Maximum 60 hrs. S/NC only.

508 Seminar (1) Reports on current research in environmental engineering at UT. Prereq: Graduate standing.

510 Environmental Protection (3) Managing of water resources, wastewater, air quality, solid wastes, and hazardous materials to promote efficiency and comfort and to safeguard health in natural ecosystems. Prereq: Consent of instructor.

520 Open Channel Hydraulics (3) Flow principles, properties, and classifications; uniform and gradually varied flow theory and applications; open channel design; steady and unsteady flow and analysis; dynamic routing; steady varied flow; non-linear alignment; microcomputers and applications, using HEC-2 model. Prereq: Hydraulics.

522 Floodplain and Urban Flood Management (3) Review of national, regional, and local flood problems; state of the art flood damage reduction alternatives; structural and non-structural; institutional responses; policies, programs, organizations, regulations, and legal aspects; floodplain hydraulics and hydrology; HEC-1, HEC-2: floodway, embankment, flood, and flood zone and damage potential determinations; case studies. Prereq: Hydraulics or consent of instructor for non-environmental engineering students. Prereq: Consent of instructor.

571 Design of Air Pollution Control Systems (3) Design and evaluation of systems used to control emissions of gaseous and particulate air pollutants. Comprehensive design of specific devices and systems. Prereq: Consent of instructor.

581 Industrial Pollution Prevention (3) (Same as Chemical Engineering 575, Microbiology 575, and Biosystems Engineering 575.)

584 Remote Sensing for Transportation and Facilities Siting (3) Principles of remote sensing; sources of data and data acquisition systems; photo interpretation, analog and digital techniques for analysis of aerial and terrestrial photo, radar and thermal imagery with application to transportation and facilities planning, construction and operations. Prereq: Consent of instructor.

585 Environmental Engineering Chemistry (3) Application of chemical principles in analyzing physical, chemical, or biological interactions of chemical contaminants in various environmental compartments: atmosphere, hydrosphere, and lithosphere. Prereq: One year chemistry and consent of instructor.

586 Solid Waste Management (3) Magnitude and characteristics of solid waste problems; collection systems; design of disposal systems: landfill, incineration, and composting, design of resource recovery systems; current and future regulations. Prereq: Consent of instructor.

595 Special Topics (1-4) Problems and topics related to current design and research field. May be repeated. Prereq: Consent of instructor.

599 Special Problems in Environmental Engineering (1-6) Enrolment limited to engineering students in non-thesis programs. May be repeated. Maximum 6 hrs. S/NC only.

600 Research and Dissertation (1-15) Prereq: Graduate standing. May be repeated. Maximum 60 hrs. S/NC only.

620 Advanced Surface Water Hydraulics (3) Advanced topics in hydraulic and hydrologic principles to design of surface water hydraulics; solutions in complex fluvial situations; dam breach modeling. Prereq: Open Channel Hydraulics or Civil Engineering 458 for geology majors. Prereq: Consent of instructor.

630 Urban Hydrology and Stormwater Engineering (3) Planning, design, modeling, management, and maintenance of urban stormwater systems. Prereq: graded by the student's faculty advisor. Prereq: Consent of instructor.

652 Soil Erosion and Sediment Yield (3) Theory of soil erosion and sediment yield processes from disturbed land; methods and computer models for estimating sediment yield. Erosion and sediment control theory and management practices. Local and state regulations. Prereq: Civil Engineering 458. (Same as Biosystems Engineering 525.)

654 Remote Sensing for Transportation and Facilities Siting (3) Principles of remote sensing; sources of data and data acquisition systems; photo interpretation, analog and digital techniques for analysis of aerial and terrestrial photo, radar and thermal imagery with application to transportation and facilities planning, construction and operations. Prereq: Consent of instructor.

655 Hydraulics (3) Open channel flow; open channel flow; hydraulic design; stream mechanics; sediment transport; water quality; water resources. Prereq: Open Channel Hydraulics or Civil Engineering 458 for geology majors. Prereq: Consent of instructor.

656 Surface Water Hydrology (3) Applied hydrology and hydrologic principles to design of water resources and applications for solving water resources problems. Prereq: Open Channel Hydraulics or Consent of instructor. Prereq: Consent of instructor.

680 Reliability of Constructed Systems (3) Development of safety factors and probability based design codes; Monte Carlo methods; computer simulation techniques. Prereq: Consent of instructor.

691 Special Topics in Environmental Engineering (1-4) Selected advanced problems of current interest. Prereq: Consent of instructor. May be repeated.

Environmental Engineering

GRADUATE COURSES

500 Thesis (1-15) Prereq: consent of instructor. May be repeated. S/NC only. E

Environment Engineering

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Special Topics in Civil Engineering (1-4) Problems and topics related to current design and research field. May be repeated. Prereq: Consent of instructor.

504 Doctoral Research and Dissertation (1-15) Prereq: Graduate standing. May be repeated. Maximum 60 hrs. S/NC only.

508 Seminar (1) Reports on current research in environmental engineering at UT. Prereq: Graduate standing.

510 Environmental Protection (3) Managing of water resources, wastewater, air quality, solid wastes, and hazardous materials to promote efficiency and comfort and to safeguard health in natural ecosystems. Prereq: Consent of instructor.

520 Open Channel Hydraulics (3) Flow principles, properties, and classifications; uniform and gradually varied flow theory and applications; open channel design; steady and unsteady flow and analysis; dynamic routing; steady varied flow; non-linear alignment; microcomputers and applications, using HEC-2 model. Prereq: Hydraulics.

522 Floodplain and Urban Flood Management (3) Review of national, regional, and local flood problems; state of the art flood damage reduction alternatives; structural and non-structural; institutional responses; policies, programs, organizations, regulations, and legal aspects; floodplain hydraulics and hydrology; HEC-1, HEC-2: floodway, embankment, flood, and flood zone and damage potential determinations; case studies. Prereq: Hydraulics or consent of instructor for non-environmental engineering students. Prereq: Consent of instructor.

571 Design of Air Pollution Control Systems (3) Design and evaluation of systems used to control emissions of gaseous and particulate air pollutants. Comprehensive design of specific devices and systems. Prereq: Consent of instructor.

581 Industrial Pollution Prevention (3) (Same as Chemical Engineering 575, Microbiology 575, and Biosystems Engineering 575.)

584 Remote Sensing for Transportation and Facilities Siting (3) Principles of remote sensing; sources of data and data acquisition systems; photo interpretation, analog and digital techniques for analysis of aerial and terrestrial photos, radar and thermal imagery with application to transportation and facilities planning, construction and operations. Prereq: Consent of instructor.

585 Environmental Engineering Chemistry (3) Application of chemical principles in analyzing physical, chemical, or biological interactions of chemical contaminants in various environmental compartments: atmosphere, hydrosphere, and lithosphere. Prereq: One year chemistry and consent of instructor.

586 Solid Waste Management (3) Magnitude and characteristics of solid waste problems; collection systems; design of disposal systems: landfill, incineration, and composting, design of resource recovery systems; current and future regulations. Prereq: Consent of instructor.

595 Special Topics (1-4) Problems and topics related to current design and research field. May be repeated. Prereq: Consent of instructor.

599 Special Problems in Environmental Engineering (1-6) Enrolment limited to engineering students in non-thesis programs. May be repeated. Maximum 6 hrs. S/NC only.

600 Research and Dissertation (1-15) Prereq: Graduate standing. May be repeated. Maximum 60 hrs. S/NC only.

620 Advanced Surface Water Hydraulics (3) Advanced topics in hydraulic and hydrologic principles to design of surface water hydraulics; solutions in complex fluvial situations; dam breach modeling. Prereq: Open Channel Hydraulics or Civil Engineering 458 for geology majors. Prereq: Consent of instructor.

652 Soil Erosion and Sediment Yield (3) Theory of soil erosion and sediment yield processes from disturbed land; methods and computer models for estimating sediment yield. Erosion and sediment control theory and management practices. Local and state regulations. Prereq: Civil Engineering 458. (Same as Biosystems Engineering 525.)

654 Remote Sensing for Transportation and Facilities Siting (3) Principles of remote sensing; sources of data and data acquisition systems; photo interpretation, analog and digital techniques for analysis of aerial and terrestrial photos, radar and thermal imagery with application to transportation and facilities planning, construction and operations. Prereq: Consent of instructor.

655 Hydraulics (3) Open channel flow; open channel flow; hydraulic design; stream mechanics; sediment transport; water quality; water resources. Prereq: Open Channel Hydraulics or Consent of instructor. Prereq: Consent of instructor.

656 Surface Water Hydrology (3) Applied hydrology and hydrologic principles to design of water resources and applications for solving water resources problems. Prereq: graded by the student's faculty advisor. Prereq: Consent of instructor.

680 Reliability of Constructed Systems (3) Development of safety factors and probability based design codes; Monte Carlo methods; computer simulation techniques. Prereq: Consent of instructor.

691 Special Topics in Environmental Engineering (1-4) Selected advanced problems of current interest. Prereq: Consent of instructor. May be repeated.
Communications

(College of Communications)

MAJOR

DEGREES

Communications .................................. M.S., Ph.D.

The College of Communications offers the Master of Science and the Doctor of Philosophy degrees with a major in Communications. In addition to the full-time program, the M.S. degree program is offered on an evening basis in Knoxville, and via distance education, at Chattanooga on the University of Tennessee at Chattanooga campus and at Martin on the University of Tennessee at Martin campus.

For application forms and other information about the M.S. and Ph.D. programs in Communications, write to: Associate Dean for Graduate Studies, College of Communications, 426 Communications Building, The University of Tennessee, Knoxville, TN 37996-0347.

ASSOCIATE DEGREES

Through special academic advising.

MAJOR

(Communications)

Communications

May be repeated. Maximum 9 hrs. and African prehistory. Prereq: Consent of instructor.

May be repeated. Maximum 9 hrs. and African prehistory. Prereq: Consent of instructor.

or S/NC. Rome. May be repeated. Maximum 9 hrs. Letter grade.

441 Special Topics in Classical Civilizations (1-3)

Prereq: 401-402 or consent of instructor. May be repeated. Maximum 9 hrs.

414 Cicero and Techniques of Latin Prose Composition (3) For advanced students in Latin, practice in prose composition, works of Cicero. Prereq: 351-352 or consent of instructor. May be repeated. Maximum 9 hrs.

415 Medieval Latin (3) Selected readings from Latin prose and poetry of medieval Europe. Prereq: Consent of instructor.

441 Special Topics in Classical Civilizations (1-3) Art, literature, religion, and society of Greece and Rome. May be repeated with consent of department. Maximum 9 hrs.

446 Studies in Classical Archaeology (3) Variable content course offering subject matter not taught in an existing course, or concentrating on one aspect of existing survey. Prereq: According to topic. May be repeated. Maximum 9 hrs.

561 Special Topics in Classical Civilization (1-3) Advanced tutorial work in Greek and Roman authors in English translation; problems of cultures of Greece and Rome. May be repeated. Maximum 9 hrs. Grand total of 96 hrs. Letter grade or S/NC.

562 Problems in Old World Archaeology (3) Selected topics and research problems in European, Asian and African prehistory. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

Degree Requirements

The M.S. program emphasizes communications management and industry in the areas of advertising, broadcasting, journalism (publications), public relations, and speech communication. For the thesis option, a minimum of 30 hours of approved graduate work is required. The non-thesis option requires 33 hours. Orientation attendance is required.

1. Nine hours of core courses—Communications 512, 540, and 560, the first three of which must be taken during the first two semesters of the student's program, except with written approval of the Associate Dean for Graduate Studies for the College.

2. Twelve hours within one department of the college, at least 6 hours at the 500 level or above. An internship, if needed, is included.

3. Three hours for the thesis option and 9 hours for the non-thesis option of electives from a list provided by the department in area of concentration.

4. Six hours of thesis work (Communications 500) or a 3-hour project (Communications 560).

Additional hours may be required for those who do not have academic prerequisites, and an internship may be required for those who do not have professional experience in the field they wish to study. A course in communications law is a prerequisite.

A student's internship experience requires approval by his/her advisor. Credit will be given through Advertising 598, Broadcasting 598, Journalism 598, or Public Relations 598 on the basis of 3 hours of credit for the equivalent of 15 weeks of full-time professional experience. This credit is to be included in the hour requirements for the M.S. program. Previous professional experience will be evaluated by the student's committee.

Students interested in subsequent entry into a doctoral program are advised to pursue the thesis option and to take additional courses in communications theory and research, subject to advisor's approval. After completion of the formal program of coursework and research for the thesis option, the student must pass an oral examination conducted by his/her graduate committee. The non-thesis option requires a written comprehensive examination and oral defense of the project.

The master's degree is required for entry into the doctoral program. Students lacking academic or professional experience in
communications will be required to take prerequisite courses. In general, however, the program may be completed within three academic years of full-time study beyond the master's degree.

The following are normally minimal requirements for admission to full potential candidate status:

1. A 3.0 (on a 4.0 system) grade-point average in undergraduate studies, and 3.5 for graduate work in a master's degree;
2. At or above the fiftieth percentile in verbal, quantitative and analytical aptitude on the Graduate Record Examination;
3. endorsement by at least three former teachers or professional colleagues; and
4. a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Ph.D. Admissions Committee are recommended and may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

A minimum of 87 hours of approved graduate work is required for the Ph.D.

1. Twenty-seven hours of core courses--Communications 612, 620, 640, 641; 6 hours of specialization; and three of the following courses: Communications 622, 632, 642, and 652.
2. Fifteen hours in a primary concentration (advertising, broadcasting, information sciences, journalism, public relations, or speech communication) supplementing the core. Courses may be taken in one or more of the Departments of Advertising, Broadcasting, Speech Communication, and/or the Schools of Information Sciences and Journalism.
3. Twelve hours in a secondary concentration (outside the College of Communications).
5. Twenty-four hours of dissertation. All courses require the approval of the student's advising committee.

Admission to candidacy must be attained at least two semesters prior to graduation and requires successful completion of a written comprehensive examination. Each doctoral student's progress will be reviewed annually by the Doctoral Committee of the College of Communications. Results will be reported to the student by his/her program advisor, who will convey the committee's recommendation concerning the student's remaining in the program (non-binding) and suggestions for improvement in performance.

Candidates without prior teaching experience must register for Communications 521, Tutorial in Communications Teaching. Placed course offerings in the College of Communications for a full calendar year are available the preceding November. This information is available from the Graduate Studies Office, 426 Communications Building, 974-6651. See also courses listed under Advertising, Broadcasting, Information Sciences, Journalism, and Speech Communication.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis.

The M.S. program in Communications is available to residents of Arkansas or Kentucky. The Ph.D. program is available to residents of the states of Alabama, Arkansas, Louisiana, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

ACADEMIC STANDARDS

A student in the College of Communications whose graduate grade-point average, not including incomplete grades, is below 3.0 at any time after the end of 12 hours of graduate credit will be placed on probation. A student on probation will be dropped from the program unless his or her cumulative graduate grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 semester hours of graduate coursework attempted that is specified in the student's degree program. Exceptions to this policy may be made only with the approval of the Associate Dean for Graduate Studies of the College of Communications on the recommendation of the student's faculty committee.

GRADUATE COURSES

400 Mass Communications Law and Ethics (3) Legal issues directly affecting the mass media: libel, privacy, free press-fair trial, judicial controls, governmental regulations, ethical standards and practices of mass media in America. Prereq: News Writing or Advertising Creative Strategy or Radio-TV News, Advertising and Promotion or History of Rhetorical Theory or consent of instructor. E

500 Thesis (1-18) P/NP only. E

502 Registration for Use of Facilities (3-15) Registration for use of facilities. May be used in conjunction with 503. S/NC only. E

512 Mass Media Research Methods (3) Applications of communications research techniques for management. Gathering and analysis of data for assessing media audiences and message impacts. Prereq: Consent of instructor or admission to program. P

521 Tutorial in Communications Teaching (1) Experience as teacher under guidance of faculty member. Prereq: Consent of instructor. S/NC only. E

540 Communications Theory (3) Selected research hypotheses and theories in literature of mass communications. Prereq: Consent of instructor or admission to program. Sp

550 Seminar in Media Economics and New Technology (3) Economic and economic factors, ownership, finance and corporate structure. Roles of new technologies and marketing techniques in influencing media content and function in future. Prereq: Consent of instructor or admission to program. Sp

551 Seminar in Science, Society, and the Mass Media (3) Investigation of interplay between scientific community and mass media: how scientific information reaches public and impact of journalism on scientific practice. Prereq: Consent of instructor.

552 Seminar in Health Communications (3) Method, problems, and issues of communication in health media. Media's "health agenda"; strategic uses of media in social marketing efforts; public communication of complex social/medical issues. Prereq: Consent of instructor.

553 Seminar in Risk Communications (3) Interaction of scientists, journalists, and public on scientific, technological, and medical risks; analysis of methods for enhancing public understanding. Prereq: Consent of instructor.

560 Seminar in Communications Management (3) Organizational structure and functions of communications corporations; development of objectives, strategies, and tactics. Analysis of critical success factors. Prereq: 612 or consent of instructor.

570 Independent Study (1-3) Reading, research or projects on special topics in communication. On individual basis, under faculty direction, with consent. May be repeated. Maximum 6 hrs. E

600 Doctoral Research and Dissertation (3-15) P/NP only. E

612 Fundamentals of Communications Research (3) Universal research process from defining ideas and problems to reporting results. Causal inference and relative strengths of various research designs. Fundamentals and specific applications of most common data-gathering and measurement techniques in communications research; research; experimental, survey, content analysis, historical and qualitative. Prereq: Consent of instructor or admission to program. Sp

620 Seminar in Mass Communications Education (3) Role and scope of mass communications teaching unit, historical perspectives of curricular trends, teaching methods and instructional objectives, classroom testing and measurement; design of professional curricula, research and extension; program evaluation; grants and contracts in research. Prereq: Consent of instructor or admission to program. Su

622 Quantitative Research (3) Techniques for evaluation of research design and measurement. Survey, content analysis, and experimental techniques. Assessment of reliability and validity. Data analysis, hypotheses testing, and inference strategies. Prereq: 512. F

532 Mass Communications History and Historiography (3) Origins and development of mass media in America, Philosophies of history, historical sources and their verification. Prereq: 512 or consent of instructor.

540 Mass Communications Theory (3) Selected research hypotheses and theories in literature of mass communications. Prereq: Consent of instructor or admission to program. F

641 Mass Communications Theory (3) Selected research hypotheses and theories in literature of mass communications theory. Prereq: Consent of instructor or admission to program. F

642 Qualitative Research (3) Theory and application of qualitative research methods to social science and communications research. Prereq: Consent of instructor or admission to program. F

652 Mass Communications Law and Legal Research (3) Legal foundations of the mass media, constitutional law in communication media, criteria for regulation. Prereq: 512 or consent of instructor.

692 Advanced Topics in Communications Theory and Methodology (3) Advanced study of communication issues, theories and methods. May use qualitative, quantitative, historical or legal approaches. May be repeated. Prereq: 622, 632, 540 or 652 or consent of instructor.
Comparative and Experimental Medicine

(Office of the Provost)

MAJOR

Comparative and Experimental Medicine............... M.S., Ph.D.

L. N. D. Potgieter, Director

Joint Graduate Coordinating Committee:

Karstal, M.D., Ph.D., Anesthesiology
Lawler, J. E., Ph.D., Psychology
Lozzio, C. M.D., Medical Biology
Potgieter, L. N. D. (Liaison), B.V.Sc., Ph.D., Veterinary Teaching Hospital
Slauson, D. O., D.V.M., Ph.D., Veterinary Teaching Hospital

The Comparative and Experimental Medicine degree program (M.S. and Ph.D.) is a jointly-administered graduate program intended to prepare students for teaching and/or research careers in the health sciences. This program emphasizes the comparative approach to the study of experimental pathobiology, infectious diseases, pharmacokinetics, epidemiology, clinical medicine, immunopathology, hematology, aberrant metabolism, oncology, and genetic disorders. The Ph.D. program is open to approved graduate students seeking training in this area and is especially useful for individuals with professional degrees. For the student with undergraduate biological science background, the Comparative and Experimental Medicine program provides an unusual opportunity to study disease processes common in humans and animals from a multidisciplinary perspective. The scope of this intercollegiate program, which pools faculty resources from both veterinary and human medicine, is broadened by faculty members representing animal science and numerous areas of the life sciences. The interdisciplinary training environment includes such diverse support as facilities and personnel at the Veterinary Teaching Hospital, UT Medical Center at Knoxville, the Oak Ridge National Laboratory, Knoxville Zoological Park, Hemophilia Clinic, Developmental and Genetic Center, Hematology and Oncology services, and departments of life sciences.

For additional information, write to the Office of Research and Graduate Programs, or access the Website at http://cem.utk.edu.

ADMISSION REQUIREMENTS

Admission requirements of The Graduate School of UT apply. In addition, all applicants must furnish three letters of recommendation from individuals who are familiar with their scholastic or professional records.

Master of Science Degree Program

Applicants must have a baccalaureate degree with coursework in chemistry through organic, mathematics through calculus, physics, and basic biology. More advanced study in biology such as biochemistry, mammalian anatomy, histology, cell biology, or other appropriate biomedical courses from an accredited university is recommended.

Applicants for admission to the Master of Science degree program whose background include formal training in the biomedical field beyond the baccalaureate degree will be required to score at least 1,000 on the quantitative and verbal portions of the Graduate Record Examination.

Doctor of Philosophy Degree Program

Applicants generally will be expected to have a master's degree in one of the biological sciences and a Graduate Record Examination score of at least 1000 for the quantitative and verbal sections, or a professional degree in one of the medical sciences, (e.g., M.D., D.D.S., D.V.M.).

An individual having a baccalaureate degree with a strong background in the physical and biological sciences may be admitted upon presenting evidence of exemplary performance on the Graduate Record Examination.

Exceptional veterinary students at UT may be admitted to the Comparative and Experimental Medicine program, but will be enrolled officially as veterinary students. During summers such students may take advantage of registering for graduate courses to be counted as elective courses in the veterinary program.

THE MASTER'S PROGRAM

All students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 7 credit hours of 500-level biochemistry or cell biology. See listings under Biochemistry and Cellular and Molecular Biology program for information on these courses. In addition, students must complete a minimum of 6 hours of coursework in a specified discipline, 5 or more hours of electives, and 6 hours of Thesis 500. Exceptions to accommodate students with specific interests must be approved by the joint Graduate Coordinating Committee after application, in writing, to the director. The graduate committee (at least 3 members) is chosen after the first term and must include at least one member from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. If a minor is declared, one member must be from the minor discipline. A final oral examination is given at the end of the program.

THE DOCTORAL PROGRAM

All students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 7 credit hours of 500-level biochemistry or cell biology. See listings under Biochemistry and Cellular and Molecular Biology program for information on these courses. In addition, students must complete a minimum of 8 hours of coursework in a specified discipline. Exceptions to accommodate students with specific interests must be approved by the joint Graduate Coordinating Committee after application, in writing, to the director. Areas of emphasis may include hematology, oncology, comparative pathology, comparative pharmacology, toxicology, immunology, genetics, infectious diseases, or biochemistry of disease. At least 24 hours of coursework, including a minimum of 6 hours at the 600 level, and 24 hours of Dissertation 600 are required for a total of 48 hours. For students with professional degrees, a minimum of 18 hours of coursework beyond the professional degree is required for a total of 42 hours.

The doctoral committee (at least 4 members) is chosen during the first year. Three of the four members, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine.

A comprehensive final examination is given at the completion of coursework. A seminar and final oral defense of the dissertation culminate the program.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate proportions allows residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S. program is available to residents of Georgia. The Ph.D. program is available to residents of the state of Florida. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Comparative and Experimental Medicine--Graduate School of Medicine

GRADUATE COURSES

Participating departments include: Anesthesiology, Medicine, Medical Biology, Obstetrics and Gynecology, Pathology, Pediatrics, Radiology, and Surgery.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E

508 Graduate Research Participation (3) Advanced research techniques while conducting individual biomedical research projects under supervision of faculty. Open to all graduate students. Prereq: Consent of instructor. May be repeated. Consent of instructor.

521 Principles of Oncology (3) Lectures, classroom discussion, and case reports surveying major topics of oncology. Prereq: Biology 202-30 or consent of instructor.

541 Molecular Basis for Human Diseases (4) Diseases at molecular level. Changes in molecular events in cells that lead to disease and occur as result of disease. Correlation with clinical and pathological states. Prereq: Biochemistry and Cellular and Molecular Biology 410-419 or equivalent. F.A.

545 Clinical Genetics (3) Human genetic disorders: new developments in cytogenetics, molecular gene-
Comparative and Experimental Medicine—Veterinary Medicine

GRADUATE COURSES

Participating departments include: Animal Science, Comparative Medicine, Microbiology, Pathology, Large Animal Clinical Sciences, and Small Animal Clinical Sciences. Several faculty in the Department of Microbiology hold joint appointments in the College of Veterinary Medicine. See Microbiology under Fields of Instruction for additional courses.

500 Thesis (1-15) P/NP only. E

501 Special Topics in Comparative and Experimental Medicine (1-6) Specialized experience in comparative and experimental medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Predictive Toxicology (3) Principles and techniques of predictive toxicology: structure-activity relationships, expert systems, neural nets and molecular similarity. Sp/A

505 Laboratory Animal Care and Use (2) Review of basic laboratory animal care and use as prerequisite to conducting research using animal subjects. Compliance issues and techniques. F


530 Wildlife Diseases (2) (Same as Wildlife and Fisheries Science 530.) F,A

551 Mammalian Organology (3) (Same as Animal Science 551.) F

552 Anatomy of Domestic Carnivores (4) (Same as Animal Science 552.) F

561 Pharmacology (4) Principles of pharmacokinetics and pharmacodynamics properties of drugs: mode of action, pharmacologic effects, chemical and physical properties, metabolism, toxicities, important idiosyncrasies and clinical applications. Prereq: Consent of instructor. F

600 Doctoral Research and Dissertation (3-15) P/ NP only. E

602 Surgical Pathology (1-2) Examination of biopsy specimens and interpretation of observations. Preparation of lesions for sectioning. Prereq: Consent of instructor. May be repeated. Maximum 3 hrs. E

603 Correlative Post-Mortem Pathology (1-3) Gross and microscopic post-mortem examination of animals. Correlative interpretation of clinical diseases and lesions. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs. E

604 Veterinary Pathology Seminar (1) Microscopic slides and descriptions of lesions from cases examined by pathologists, residents, and graduate students. Interpretation of observations. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. E

605 Pathobiology Seminar (1) Subjects of current interest in biomedical science. Students present one seminar per term enrolled. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. Class meets once monthly. E

606 Clinical Epidemiology (3) Theory and principles of design implementation and analysis of clinical research. Lab: appraisal of biomedical literature and design of proposal for clinical research project. Prereq: Consent of instructor. Sp

607 Diagnosis and Pathogenesis of Virus Diseases of Domestic Animals (3) Advanced study of virus diseases important to domestic animals: virus biology, pathogenesis, pathology and diagnostic techniques in virus diseases diagnosis. Prereq: Consent of instructor. 2 hrs and 1 lab. Sp

608 Descriptive and Applied Epidemiology (2) Principles of epidemiologic and modern application to diseases of animals. Host-agent relationships, measurement of disease frequency, animal production and disease monitoring and control, field investigations, animal health economics. Prereq: Consent of instructor. Sp/A

609 Mechanisms of Disease (4) Advanced study in pathobiology and mechanisms of disease: pathophysiology, cellular degeneration, inflammation, immunopathology, hemostasis. Principal biochemical and morphologic responses of various cells, tissues, and organs to injury and other metabolic derangements. Selected contemporary topics from current literature and textbooks. Prereq: Consent of instructor. Sp/A

610 Advanced Topics in Comparative and Experimental Medicine (1-3) Specialized in-depth experience in various disciplines. Current and future research methods, advanced in instrumentation in analytical techniques for comparative medicine. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. E

611 Advanced Topics in Animal Anatomy (1-4) (Same as Animal Science 651.) E

652 Disorders of the Endocrine System (2) (Same as Animal Science 652.) Sp/A

### Computer Science

#### (College of Arts and Sciences)

**MAJOR**

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<th>DEGREES</th>
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| Computer Science | M.S., Ph.D.

Robert C. Ward, Head

Professors:

Dongarra, Jack, Ph.D. .............. New Mexico
Langston, Michael A., Ph.D. ......... Texas A&M

Poore, J. H., Ph.D. .............. Georgia Tech
Sherman, Gordon R. (Emeritus), Ph.D. Purdue
Thomson, Michael G., Ph.D. ........ Duke
Ward, Robert C., Ph.D. ............. Virginia

**Associate Professors:**

Berry, Michael W., Ph.D. ............. Illinois
Raghavan, Padma, Ph.D. ............. Penn State
Vander Zanden, Bradley, Ph.D. .......... Cornell
Voss, Michael D., Ph.D. ............ Texas

**Assistant Professors:**

Wolski, Richard, Ph.D. ............. UC Davis

**THE MASTER'S PROGRAM**

Two semesters of calculus plus two additional semesters of college mathematics (e.g., linear algebra, differential equations, probability) and a course in discrete structures and in systems programming are required for admission. For the master's degree, 30 semester hours of graduate credit are required, 24 of which must be 500 level or above. Computer Science 530, 560, and 580 are required for the degree.

Graduate courses taken outside the department are sometimes allowed but must be approved by the Graduate Committee before enrollment.

**Thesis Option**

The student must reach agreement on a thesis topic with a faculty advisor and must take 6 hours of 500 Thesis. Six hours of 500 Thesis may count in the 24-hour requirement at the 500 level or above.

**Non-Thesis Option**

The student must take coursework in an area prepared for the non-thesis master's examination. The student's advisor must verify that an acceptable set of courses has been taken before the student may schedule the examination. Information concerning the examination is available in the department office.

**Problems in Lieu of Thesis Option**

The student must reach agreement on the problem topic with a faculty advisor and pass an oral exam on the problems before a committee of three or more faculty members, at least two of whom must be Computer Science faculty.

**Master's Minor in Computer Science**

The graduate minor consists of any two of the three core courses (530, 560, 580) plus an additional 3 hours of graded computer science graduate-level courses at or above the 400 level.

**THE DOCTORAL PROGRAM**

A student seeking admission to the Ph.D. program is expected to meet the following requirements:

1. The student should have three letters of recommendation sent directly to the department head from individuals capable of
GRADUATE COURSES

420 Advanced Topics in Machine Intelligence (3)
Search, learning, expert systems, neural networks, pattern recognition and natural language processing. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

430 Advanced Topics in Hardware Systems (3)
Architecture, parallel processors, microprogramming, networks, and communications. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

450 Advanced Topics in Computer Systems (3)
Operating systems, compilers, parallel computation, software engineering, database systems and programming languages. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

460 Advanced Topics in Software Systems (3)
Design and operation of networks, hardware and software systems; communications protocols; programming languages; database systems; comparison of implementations; analysis of distributed networks. Techniques for evaluation of performance, security, reliability and security. Prereq: Discrete Structures.

541 Database Management Systems (3)
Data model theory, optimization, normalization; intelligent database systems; comparison of implementations; analysis of distributed and networked databases. Techniques for data retrieval, security, integrity, and transaction. Prereq: System Programming and 592.

571-72 Numerical Mathematics (3) (Same as Mathematics 571-72).

573 Finite Difference Methods for Partial Differential Equations (3) (Same as Mathematics 573).

574 Finite Element Methods (3) (Same as Mathematics 574).

575 Matrix Theory and Techniques in Numerical Analysis (3) (Same as Mathematics 575).

576 Sparse Matrix Computations (3) Solution of large sparse linear systems: graph models, reordering techniques, symbolic factorization, data structures, numerical algorithms, complexity analysis, parallel algorithms. Prereq: Numerical linear algebra.

580 Foundations (3) Foundations of computer science, including computability, computational complexity, fundamental algorithms and algorithm analysis. Required background: Automata theory.

581 Advanced Design and Analysis of Algorithms (3) Analysis of algorithms and relevance of best known algorithms to design of efficient computer algorithms. Sorting, searching, graph algorithms, pattern matching, dynamic programming, efficient approximation algorithms. Prereq: 580.

593 Independent Study (1-15)
May be repeated. Maximum 9 hrs.

594 Special Topics in Computer Science (1-3) May be repeated. Maximum 9 hrs.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when the student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NP only. E

666 Advanced Topics in Software Systems (1-6)
Prereq: Consent of instructor. May be repeated with consent of department.

670 Advanced Topics in Scientific Computing (1-6)
Prereq: Consent of instructor. May be repeated with consent of department.

680 Advanced Topics in Theory and Foundations (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

690 Advanced Topics in Computer Science (1-6)
Prereq: Consent of instructor. May be repeated with consent of department.

Consumer and Industry Services Management

College of Human Ecology

MAJORS DEGREES

Consumer and Industry Services Management prepares students for the management and administration of service facilities in consumer and hospitality industries. Concentrations in Therapeutic Recreation, Tourism, and Hospitality Management prepare students for management positions in therapeutic recreation, recreation administration, tourism, and hospitality management. An interdepartmental/interdisciplinary minor in gerontology offers the graduate student an opportunity to combine the knowledge and experience about aging in American society with his/her own major concentration.

The Department of Consumer and Industry Services Management offers courses designed to meet the needs of students majoring in Textiles, Retailing and Consumer Sciences, concentrations in Textile Science and in Retail and Consumer Sciences; and in Recreation, Tourism and Hospitality Management, concentrations in therapeutic recreation, recreation administration, tourism, and hospitality management. An interdepartmental/interdisciplinary minor in gerontology gives the graduate student an opportunity to combine the knowledge and experience about aging in American society with his/her own major concentration.

The programs in Consumer and Industry Services Management prepare students for...
careers in industry, business, public and private agencies, and educational institutions. Master's level work enables students to conduct research in retail management and merchandising and in the consumer areas related to retail decision making. Students in textile science are expected to have a solid foundation in mathematics, as well as a formal background in a physical science or engineering.

Interested students should contact the department head for more information.

ADMISSION REQUIREMENTS

A complete file for review includes the Graduate School application file, Department of Consumer and Industry Services Management application, Graduate Record Examination (GRE) scores for the general section, and three Graduate School Rating Forms completed by individuals who can attest to the potential for graduate education. Forms may be obtained from the Dean's Office, College of Human Ecology. In addition to specified entrance requirements stipulated by The Graduate School, admission to the master's degree program with a major in Textiles, Retailing and Consumer Sciences is dependent on completion of undergraduate courses that give the necessary background for success in the graduate program. For the concentration in retail and consumer science, students should have an adequate background in retailing and/or consumer science supported by coursework in economics, marketing, mathematics, and statistics. For the concentration in textile science, students should have a basic technical background in textile science or materials science supported by mathematics through differential equations, organic chemistry, and general physics.

Superior students deficient in one or more of the above requirements, may be admitted at the discretion of the department's graduate faculty.

THE MASTER'S PROGRAM

The requirements for the major in Textiles, Retailing and Consumer Sciences are listed below.

Retail and Consumer Sciences (Thesis) Major (Required RCS courses): 510, 511, 541, 550, 562, 590 16
Cognate Area 6
Statistics 6
Thesis 6
Total 34

Retail and Consumer Sciences (Non-Thesis) Major (Required RCS courses): 510, 511, 541, 550, 562 15
Cognate Area 6
Statistics 6
501 (Professional Paper/Project) 3
Electives 9
Total 36

Textile Science (Thesis Option) RCS 552 3
Research Methods* 3
TS 590 1
Textile Science courses 12
Cognate Area 6
Statistics 3
Thesis 6
TOTAL 34

Textile Science (Non-Thesis Option)

Nonwovens Core

(Required TS courses: 510, 521, 526, 528, 565) 15
Related Courses 9
Statistics 3
Professional Project, TS 501 3-6
Total 30-33

The major in Recreation, Tourism and Hospitality Management requires 33-36 hours for the thesis option and 30-39 hours for the non-thesis option depending upon the specific concentration. For all thesis concentrations, individuals not possessing an undergraduate degree in the discipline or having appropriate full-time work experience will be required to take 590 (graduate internship).

Requirements for each concentration are:

Hospitality Management

All students (28 hours): Hotel and Restaurant Administration 532, 537, 542; Nutrition 541; Hotel and Restaurant Administration/Nutrition electives (12 hours); related area (6 hours); statistics (3 hours);

Thesis Option (6 hours): 500;

Non-Thesis Option (6 hours): 535; Hotel and Restaurant Administration/Nutrition elective (3 hours); elective (3 hours).

For a description of courses in the hospitality management concentration, see Nutrition.

Recreation Administration

All students (27 hours): 415 or 440, 510, 515, 540, 641; Safety Education 443; Sport Management 512; statistics (3 hours); research methods (3 hours);

Thesis Option (6 hours): 500;

Non-Thesis Option (9 hours): 590 (6 hours); elective (3 hours).

Therapeutic Recreation

All students (24 hours): 420 or 425, 510, 515, 520, 522; statistics (3 hours); research methods (3 hours);

Thesis Option (9 hours): 500; elective (3 hours);

Non-Thesis Option (12 hours): electives (6 hours); 590 (3-6 hours).

Tourism

All students (30 hours): 470, 510, 515; Hotel and Restaurant Administration 532, 542; Marketing 510; Hotel and Restaurant Administration 555 or Planning 540; Planning 548 or 550; statistics (3 hours); research methods (3 hours);

Thesis Option (6 hours): RTM or HRA 500;

Non-Thesis Option (9 hours): 590 (3-6 hours); elective (3-6 hours).

THE PH.D. CONCENTRATIONS

Retail and Consumer Sciences

Students enrolled in the Ph.D. program in retail and consumer sciences are provided with a foundation in management and retail and consumer sciences to further theory and application in advanced study and research. Requirements are either 81 or 90 hours, depending upon whether students select a minor in statistics. Requirements include:

RCS Required Courses: 614, 615, 625, 641, 651 15
Research Methods: 590, 616 5
Statistics 12-15
Cognate Area 9
Human Ecology 630 3
Electives 21
Dissertation 24
Total 83-89

Note: (1) Statistics hours must include Statistics 537, 538, 579. (2) Cognate hours must include at least 3 hours at the 600 level. (3) Students choosing to take a minor in statistics will take a minimum of 15 hours of prescribed statistics courses and are not required to take a cognate area.

Textile Science

Students enrolled in the Ph.D. program in Human Ecology with a concentration in textile science take one common course which provides a foundation for the integration of textiles and apparel in the context of the near environment. A required departmental research seminar exposes students to research being conducted in all areas of study in the department. Requirements include:

Textile Science Courses 18
TS 552 3
TS 590 2
Cognate Area 9
Statistics (500-600 level) 6
Research Methods* 6
Electives 14
Dissertation 24
Total 82

*Must include 6 hours of laboratory techniques in materials analysis and characterization.

Note: Students must take a minimum of 9 hours at the 600-level in the College of Human Ecology exclusive of dissertation. Transfer students with a master's degree from another institution are required to complete at least 42 hours (including dissertation hours) from UT.

ACADEMIC STANDARDS

1. Evaluation of student progress will normally occur prior to enrollment for thesis hours (or the non-thesis option) and during the second semester of full time enrollment in the program. The review of the student will be undertaken by the faculty with consideration given to factors such as GPA (minimum 3.0), portfolio evaluation, and demonstrated research capability.

2. If progress or performance is deemed insufficient, the faculty may recommend probation with specific goals set for a specified time or termination.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S. program in Recreation, Tourism, and Hospitality Management is available to residents of the state of Kentucky. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records. For the Ph.D., see Human Ecology.
Hotel and Restaurant Administration

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Requisite for the student otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
530 Computer-Assisted Foodservice and Lodging Management (3) Application of computer technology to foodservice and lodging industry; inventory, cost accounting, production, nutrient analysis, rooms management, and sales planning and analysis. Prereq: Quantity Food Procurement, Production and Service, Microcomputer Applications or consent of instructor. F.A
531 Advanced Financial Management (3) Financial planning, operations and evaluation techniques used in foodservice and lodging management; developing budgets, accounting systems and financial reports. Prereq: Food and Lodging Cost Control or consent of instructor. F.A
532 Advanced Human Resource Management (3) Identifying labor needs; development and maintenance of work force. Prereq: Food and Lodging Personnel Development or consent of instructor. F.A
533 Advanced Food Production and Delivery System Management (3) Application of food production and delivery systems; application of quantitative methods and models to optimize decisions. Prereq: Quantity Food Procurement, Production and Service or consent of instructor. F
534 Special Topics in Foodservice and Lodging Administration (1-3) Lecture/discussion format. Contemp developments and trends in industry. Prereq: Consent of instructor. May be repeated. E
535 Directed Study in Foodservice and Lodging Administration (1-3) Problems selected for study by student with guidance of faculty member. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
537 Seminar in Foodservice and Lodging Administration (1-5) May be repeated. S/NC only. F
542 Advanced Hotel Administration (3) Strategic management of hotel organizations. Theoretical and applied literature on formulation and implementation of strategies; external and internal factors relevant for business and corporate level decisions. Consideration of role of marketing in hotel firms. Analysis of industry and case studies. Prereq: 501, 532. Sp.A
544 Experimental Study of Quantity Food Production (3) Design and preparation of food products applicable to foodservice industry. Market research, sensory evaluation, production techniques, and microbiological evaluation of food. Prereq: Quantity Food Procurement. Production and Service with lab, or Observation, Hospitality Sales and Marketing, 542 and Nutrition 413, or equivalents. F.A
547 Field Experience (3-9) Experience in food- or lodging-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/NC only. E
555 Foodservice and Lodging Law (3) Management organization and policy as imposed or granted by law. Legal research to determine legal policies at state and federal levels which impact industry. Prereq: Hospitality Law or equivalent, or consent of instructor. Sp.A
600 Doctoral Research and Dissertation (3-15) P/NP only. E

Recreation and Tourism Management

GRADUATE COURSES

415 Development and Maintenance of Recreation, Tourism and Athletic Facilities (3) Principles of design, planning, equipping, operating and maintaining various facilities. Elements of risk management and safety in design process. Prereq: 310 Development and Evaluation of Recreation and Tourism Programs or consent of instructor. (Same as Sport Management 415.) F
430 Organization and Administration of Leisure and Tourism Services (3) Principles of administration applied to provision of recreation and tourism services offered by public, private and/or commercial enterprises. Organizational structures, personnel management, evaluation, financial authority, introduction to budgeting and fiscal procedures. Prereq: 310 or consent of instructor. F
440 Dimensions of Commercial Recreation and Tourism Enterprises (3) Organizational structures, delivery systems, financing, private enterprises and operating selected profit centers in variety of settings. Market performance and economic impact. Prereq: 110 Recreation Fundamentals, junior standing or consent of instructor. Sp
450 Special Topics in Leisure Education and Tourism (1-6) Development of special topics in recreation, therapeutic recreation and tourism. May be repeated. Maximum 9 hrs. E
470 Tourism and Leisure Industries (3) Symbolic relationship between tourism and various sectors of leisure industry. Use of resources, both natural and developed, and economic impacts of ventures. Sociocultural impacts on venue as well as venues impact on local population. Sp
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Requisite for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
510 Perspectives and Trends in Leisure Services (3) Basic role of leisure delivery systems in today's society. Role of leisure behavior, developmental features of leisure and recreation. Current trends, problems, laws, and issues faced by and/or affecting delivery of leisure services. Sp
515 Philosophical and Conceptual Foundations of Leisure (3) Philosophy of leisure and recreation; nature of philosophy, concepts of leisure, recreation, play, work, and other factors, history of field, and relationship of ideas to contemporary society and professional practice. F
520 Program Design and Evaluation in Therapeutic Recreation (3) History, philosophy, nature, purpose, special populations served, programming process, professional aspects of therapeutic recreation. Basic overview of aspects of leisure delivery systems. Prereq: Consent of instructor. F
521 Facilitation Techniques in Therapeutic Recreation (3) Role of therapeutic recreation in clinical and non-clinical settings; application of life-style planning, self-awareness, values clarification and awareness training in therapeutic recreation, relationship of leisure education to therapeutic recreation. Prereq: 520 or consent of instructor. Su
522 Clinical Aspects in Therapeutic Recreation (3) Concepts and techniques utilized by experienced and advanced therapeutic recreation specialists: clinical illnesses, comprehensive program concepts and administrative funding and trends in practice of therapeutic recreation services. Prereq: 520. Sp
540 Fiscal Policies for Recreation and Sports Related Organizations (3) Application of fiscal policies and procedures to operation of recreation and sports related organizations and facilities. Prereq: Consent of instructor. S/NC only, E
541 Management and Operation of Recreation and Sport Related Facilities (3) Research for making program and management decision, process of cost analysis, and basic design and maintenance of recreation and sport related facilities. Prereq: Consent of instructor. Su
590 Graduate Internship (3-6) Required of all graduate students. Minimum 50 clock hrs for each credit hour. Work experience, evaluation by agency and university and written report required. E
591 Directed Study in Leisure & Recreation (1-6) May be repeated. Maximum 6 hrs. E
592 Special Topics In Recreation & Leisure Studies (1-8) May be repeated. Maximum 8 hrs. E

Retail and Consumer Sciences

GRADUATE COURSES

411 Entrepreneurship and Small Business Management (3) Concepts of entrepreneurship within single ownership and other business organizations; risk taking and risk management; management of small business; current issues and problems. Prereq: Marketing 301 Principles of Marketing, Accounting 202 Principles of Managerial Accounting.
412 Direct Retail Methods (3) Use of direct selling methods to sell goods and services. Analysis of consumers and product/service types for integrated direct retail methods. Direct mail, catalogs, telemarketing, infomercials, and electronic commerce (internet). Prereq: 376 Strategies for Growth.
415 Retail Promotion (3) In-store promotional activities; development of retail promotion strategies; evaluation of retail promotions; supplementary focus on advertising and other methods to communicate in store promotions. Prereq: 376 Strategies for Growth.
450 Economics of Consumer Choice (3) Micro and macro economic approaches to consumer choice across life span; demographics; economic status of consumers; demand analysis; market structure and its impact on consumers; economics of information, implications on public and private sectors. Required background: Introductory economics.
500 Thesis (1-15) P/NP only. E
501 Professional Project (3-5) Application-oriented, capstone project to show competence in major academic area. Enrollment limited to retail and consumer sciences students in non-thesis program. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.
502 Registration for Use of Facilities (3-15) Requisite for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
510 Retail Strategy and Decision Making (3) Strategy, strategic management and strategic process in retail sector, Analytical decision-making skills in retailing, retail industry structure, international differences in retail systems. Prereq: Retail Management or equivalent. Su
541 Retail Consumer Analysis (3) How consumers make decisions and how retailers attempt to influence decisions by offering environment, image and selection coinciding with customers' needs.

550 Consumer Economics and Market Choices (3) Economic framework for evaluating consumer behavior and consumer sciences within market system. Theory of consumer preferences and decision making; consumption and demand models for individuals and households. International consumer economics, issues and policies. Prereq: Textiles and Apparel Economics, Mathematics 503 or equivalent. F,A


562 Research Methods (3) Fundamentals of science method, advancement of science; methodology and method of research, issues and concepts of basic and applied research. Prereq: Statistics 531 or equivalent. Sp

590 Research Seminar (1) Research topics in retail and consumer sciences. May be repeated. S/N only. F,Sp

593 Directed Study (1-3) Individual problems in retailing and consumer sciences. Prereq: 9 hrs retailing and consumer sciences graduate coursework. May be repeated. Maximum 9 hrs.

595 Special Topics in Retail and Consumer Sciences (1-3) Lecture, group discussion on specialized topics: retail industry structure, international trade, international consumption, consumer affairs, entrepreneurship, small business, management issues in retail management, issues in retail strategy, quality perception by consumers, product and service value, retailing to children, retailing and special populations, special research methods. Prereq: 9 hrs graduate coursework. May be repeated. Maximum 9 hrs.

600 Dissertation (3-15) S/N only. E


615 Retail and Consumer Sciences Literature and Thought (3) Evaluation of retail and consumer sciences literature with emphasis upon research literature, development of scholarly thought, and identification of potential areas of further study. Prereq: 562, Marketing Economics 501. F,A

616 Research Methods, Models and Measurement in Retail and Consumer Sciences (3) Quantitative methods and analytical concepts in research process. Mathematical and statistical formulation of retail and consumer sciences phenomena, utilizing models, model building and measurement constructs. Prereq: 562; Statistics 598. Sp,A

625 Strategic Managerial Retailing (3) Decision-making orientation that integrates strategic framework components with preparation and analysis of specific retail case situations. Prereq: 510.

641 Retail Consumer Behavior (3) Theories and concepts from social science in relation to ultimate consumer's behavior. Prereq: 6 hrs of sociology and/or psychology or consent of instructor.

651 The Consumer and Public Policy (3) Public policy issues within consumer environments. Analysis of past and present policies within economic, social, legal and business frameworks. Implications of consumer issues and policy frameworks. Literature and research focus. Prereq: 550 or consent of instructor.

695 Advanced Topics in Retail and Consumer Sciences (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance to retail and consumer sciences. Prereq: 9 graduate hours in consumer sciences. May be repeated. Maximum 9 hrs.

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**Textile Science**

**GRADUATE COURSES**

500 Thesis (1-15) S/N only. E

501 Professional Project (3-6) Application-oriented, capstone project to show competence in major academic area. Enrollment limited to textile science students in non-thesis program. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/N only.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time. Credit and/or degree is completed. May not be used toward degree requirements. Requires consent of instructor. May be repeated. S/N only.

510 Fiber Science (3) Physical properties, mechanical properties and microstructure of polymeric fibers; relation to end-use properties. Prereq: Organic Chemistry and Thermal Physics or equivalent.


521 Nonwovens Science and Technology I (3) Nonwoven fabric technology; different web forming processes; and relationships among the chemical, morphological and mechanical properties of fibers and orientation in webs to final performance properties of bonded structures. Prereq: Organic chemistry or consent of instructor.

526 Nonwovens Science and Technology II (3) Interrelationships between mechanics of production and mechanical properties of nonwoven fabrics; characterization of fiber morphology and web structure; chemistry of nonwoven binders and finishing, and engineering of specific fabric properties. Prereq: 521 or equivalent.

528 Laboratory Methods in Nonwovens Processing and Characterization (3) Laboratory experience in nonwovens fabrication processes and characterization techniques. Effect of processing conditions on structure and properties of different types of webs. Prereq: 510 and 521.

552 Economics of Textile Complex (3) Economics consideration of U.S. textile complex. Qualitative approaches to industry structure, production marketing, distribution and institutions within both global and domestic settings. Current and future international issues and implications. Prereq: Calculus III or equivalent; microeconomics. F,A


590 Research Seminar (1) Research topics in textile science. May be repeated. S/N only. F,Sp

593 Directed Study (1-3) Individual problems in textile sciences. Prereq: 9 hrs textiles graduate coursework. May be repeated. Maximum 9 hrs.

595 Advanced Topics in Textile Science (1-3) Lecture, group discussion on specialized topics. Prereq: 9 hrs textiles graduate coursework or consent of instructor. May be repeated. Maximum 9 hrs.

600 Dissertation (3-15) S/N only. E

625 Physical Chemistry of Fibers (3) Physical chemistry of fibers and fiber forming polymers; surface chemistry and thermal properties. Prereq: 510.


695 Advanced Topics in Textile Science (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance: future direction, professional issues, theoretical approaches. Prereq: Doctoral student and 9 hrs textiles graduate coursework. May be repeated. Maximum 9 hrs.

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**Counseling, Deafness and Human Services**

(1) College of Education

**MAJORS**

**DEGREES**

Counseling ................................................. M.S., Ed.S., Ph.D.

Social Work ............................................. M.S., Ed.S., Ed.D.

Psychology ................................................. M.S., Ed.D.

**MAJORS**

Counseling ................................................. M.S., Ed.S., Ph.D.

Social Work ............................................. M.S., Ed.S., Ed.D.

Psychology ................................................. M.S., Ed.D.

**Counseling, Deafness and Human Services**

(1) College of Education

**MAJORS**

**DEGREES**

Counseling ................................................. M.S., Ed.S., Ph.D.

Social Work ............................................. M.S., Ed.S., Ed.D.

Psychology ................................................. M.S., Ed.D.

**Counseling, Deafness and Human Services**

(1) College of Education

**MAJORS**

**DEGREES**

Counseling ................................................. M.S., Ed.S., Ph.D.

Social Work ............................................. M.S., Ed.S., Ed.D.

Psychology ................................................. M.S., Ed.D.

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The Department of Counseling, Deafness and Human Services participates in graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Counseling

Mental health counseling

Rehabilitation counseling

School counseling

Education

Track 1-education of the deaf and hard of hearing

Track 2-education of the deaf and hard of hearing

Educational Specialist

Education

School counseling

Doctor of Philosophy

Education

Counseling psychology

South Carolina State University

See Education under Fields of Instruction for full description of all degree requirements.
Counselor Education and Counseling Psychology

GRADUATE COURSES

410 Gender Role Development: Implications for Education and Counseling (3) Theories and research: development of gender roles and their relevance to identity and behavior in socio-psychological, educational, and counseling settings. (Same as Women’s Studies 410) F, Su

431 Personality and Mental Health (3) Various perspectives of mental health with application to education and other social institutions. E

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E


504 Special Topics (1-3) Instructor-initiated course offered at convenience of academic unit on topics of current interest. May be repeated. Maximum 16 hrs. S/NC or letter grade. E

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Statistics and Research Design: Conceptual (3) Consumer-oriented, conceptual treatment of statistics, research design, and quantitative basis of testing. E

525 Formal Measurement in Education and Counseling (3) Principles of test construction and item analysis. Survey of standardized tests of intelligence, achievement, aptitude, vocational interest, attitudes and personality. Prereq: 520 or equivalent. F, Su

535 Ethical, Legal, and Professional Issues in Counseling (3) Professional practice issues in school and community counseling and related fields: education, research, standards of practice, credentialing, and policy. Prereq: Admission to counseling program or consent of instructor. Su, A

550 Introduction to Pupil Personnel Programs (3) History, philosophy, professional standards, counselor role in relation to total staff and mental health professionals, and ethics of profession. F

551 Theory and Practice of Counseling (3) Philosophical bases of helping relationships; development of counselor and client self awareness; counseling theory/techniques. F, Su

552 Career Development: Vocational Theory, Research and Practice (3) Relationship of vocational theory, career development research and societal factors to life career roles. F

553 Career and Educational Information Systems and Resources (1) Use of print and non-print materials: computer-based systems, for career and educational planning. Prereq: 552 or consent of instructor. Su, A

554 Group Dynamics and Methods (3) Theory and types of groups, descriptions of group practices, methods, dynamics, and facilitative skills, supervision of leadership skills. E

555 Practicum in Counseling (3) Supervised practice and application of counseling skills with individuals. Prereq: Admission to counseling program. 451, 520, 551 and consent of instructor. May be repeated. Maximum 9 hrs. E

556 Orientation to Mental Health Counseling (3) Mental health counseling as profession: professional organizations, work settings, code of ethics, certification requirements, and role identity. F, Sp

558 Internship in School Counseling (1-6) Supervised postpracticum employment at academic unit approved site. Prereq: 550 and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only. E

559 Internship in Community Agency Counseling (1-6) Supervised postpracticum employment at academic unit approved human services agency. Prereq: Admission to community agency program, 565 and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only. E

561 Development and Operation of School Counseling Programs (3) Management of comprehensive school counseling programs to include needs assessment, program goals, resource identification, evaluation, and use of computer-based program management software. Prereq: 550. Sp,Su

565 Facilitation of Technical Task Groups (3) Technical and social aspects of group dynamics in context of technical task groups. Application of counseling techniques to facilitation of workplace teams. Prereq: 551, 554, or consent of instructor. F

586 Approaches to Family Intervention and Counseling (3) (Same as Child and Family Studies 586.) E

570 Cross-Cultural Counseling: Theory and Research (3) Theory and research on issues and problems in counseling of clients from different cultural backgrounds in U.S. and abroad. Sp

571 Individual Cognitive Assessment in Counseling (3) Basic concepts and applications in individual assessment of intelligence, proficiency in administrative interpretation for individuals and groups. Prereq: 520 and admission to counseling program or consent of instructor. S, NC only. A

585 Seminar in Gerontology (1) (Same as Human Ecology 585, Educational Psychology 585, Exercise Science 585, Nursing 585, Public Health 585, Social Work 585, and Sociology 585.) E

593 Independent Study (1-3) Maybe repeated. S/NC or letter grade. E

600 Doctoral Research and Dissertation (3-15) P/NP only. E

602 Directed Research (1-3) Instructor-initiated, group investigation of empirical problems in education and counseling psychology. May be repeated. Maximum 12 hrs. S/NC only. E

604 Special Topics (1-3) Instructor-initiated course offered at convenience of academic unit on topics of interest. May be repeated. Maximum 15 hrs. S/NC or letter grade. E

625 Advanced Study in Personality (3) Theory, research, and conceptual analysis of patients with application to education and counseling. Prereq: 431 or equivalent. F

635 Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Educational Psychology 635.) Sp

650 Seminar in Counselor Education (1) Professional issues related to role and function of counselor-educator. Prereq: Admission to doctoral program in counselor education. May be repeated. Maximum 2 hrs. S, NC only. F

655 Practicum in Counselor Education (3) Supervised practice and application of counseling skills with clients. Prereq: Admission to counselor education program and consent of instructor. May be repeated. Maximum 6 hrs. Sp

659 Internship in Counselor Education (1-6) Supervised employment in academic unit approved internship sites in counselor education. May be repeated. Maximum 12 hrs. S/NC only. E

661 Education Implications of Neuropsychology (3) Theories of assessment, Common syndromes and their behavioral and cognitive manifestations. Prereq: 516 and 541 or equivalent individual assessment course; or consent of instructor. Sp, A

662 Applied Research Design (3) Planning of empirical investigations, collection of data, and drawing of inferences from evidence gathered. Prereq: Two course sequence in statistics. F


671 Personology and Vocational Assessment (3) Use and interpretation of personality and vocational measures in assessment of clients. Prereq: 525, 552 or consent of instructor. A

672 Psychological Dysfuncion (3) Classification methods, dynamics and treatment of dysfunctional individuals in counseling. Prereq: 625 and course in abnormal psychology, or consent of instructor. A

673 Advanced Theory and Practice in Group Counseling (3) Theories and supervised practice. Prereq: 554, 555, and consent of instructor. F

674 Practicum in Counseling Psychology (3) Supervised practice of individual counseling. Minimum 135 clock hours required each semester. Prereq: Admission to counseling psychology doctoral program, 555, and consent of instructor. May be repeated. Maximum 6 hrs. E
678 Theory and Practice of Counseling Supervision (3) Theory and practice of supervision in counseling. Prereq: 665, 674, or consent of instructor. S/N only. E

679 Internship Counseling Psychology (1-6) Supervised employment in departmentally approved counseling psychology internship sites. Prereq: Admission to counseling psychology doctoral program and consent of instructor. 60-120 hrs. S/N only. E

693 Independent Study (1-3) May be repeated. S/N only. E

Rehabilitation and Deafness

GRADUATE COURSES

415 Language Development of Deaf/Hard of Hearing I (3) Language problems of hearing impaired contrasted with scope and sequence of normal language development. Formal linguistic systems used to describe language development problems.


419 Speech Development of Deaf/Hard of Hearing (4) Theories of speech development, approaches in training perception and production of speech, and aural habilitation. Practicum experiences.

424 Nature of Hearing Impairments (3) Basic principles of audiology: anatomy and physiology of hearing; nature and causes of hearing loss; methods and instrumentation for assessment of hearing level; interpretation of audiological services to medical and other rehabilitation disciplines.

425 Introduction to the Psychology and Education of the Deaf/Hard of Hearing (3) Primarily for those planning to teach hearing impaired. Overview of research related to psychology, social adjustment, and communication methodology, language development and education of hearing impaired. Survey of literature. Visits to programs.

431-32 American Sign Language III, IV (3,3) Fluency of expression and receptive sign communication skills. Use of language in context. Grammatical structures of ASL and cultural implications of deaf community. Must be taken in sequence. Prereq: 425; 431 for 432 and consent of instructor. E

500 Thesis (1-15) P/N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E

503 Problems In Lieu of Thesis (2-3) May be repeated. Maximum 9 hrs. S/N only. E

504 Clinical Experience in Teaching an Supervision of Exceptional Children (3-9) Same as Special Education 504.

508 Vocational Guidance and Career Planning With Hearing Impaired (3) Utilization of psychological, educational, social and vocational, diagnostic materials and resources appropriate for hearing impaired persons to provide guidance in career decisions and individualized rehabilitation plan.

518 Educational Specialist Research and Thesis (3) May be repeated. P/N only. E

523 Practicum with Deaf/Hard of Hearing (3) Receptive and expressive language capabilities of hearing impaired students. Designing, teaching, and post-testing unit of instruction for remediation of specific language errors.


529 Teaching Reading to Deaf/Hard of Hearing (3) Specific methods necessary to teach the prelingually hearing impaired student. Practicum in preparation of developmentally appropriate reading teaching methods which assist in integrating hearing impaired students in regular reading curricula and materials. Prereq: 415.

530 Orientation to Rehabilitation (3) History, philosophy, legal and economic bases, current issues, and practices in public and private rehabilitation programs. Qualifications of service providers. Assessment, planning development, and provision of services to people who have disabilities and vocational handicaps. Identification, mobilization, and utilization of rehabilitation resources.

532 Caseload Management in Rehabilitation (3) Techniques and procedures involved in management of caseloads in Federal-State vocational rehabilitation agencies; private rehabilitation companies, and public and private agencies. Survey of analysis of appropriate industrial management models related to rehabilitation programs.

533 Job Analysis, Development, and Placement (3) Determining employment-readiness of people with disabilities; identifying appropriate jobs for selected clients, and assisting clients in seeking, obtaining, and retaining employment. Job analysis, job modification and re-engineering, marketing, and employer-service techniques; legal considerations; job placement; supported work; and use of occupational information.

535 Vocational Evaluation: Statistical Methods (3) Process principles and techniques used to determine vocational assets and liabilities of people with disabilities. Functional analysis of biographical and interview data; selection and application of relevant psychological principles and techniques; interpretation of data from formal staff conference, vocational counseling, and report writing.

536 Disability Management (3) Process principles and techniques used to assist individuals in determining and understanding their own work history, potential, and work experiences. Analysis of educational programs and jobs in which an individual may be employed. Selection and application of relevant psychological principles and techniques to assist in vocational evaluation.

537 Vocational Evaluation: Clinical Methods (3) Process principles and techniques used to assist individuals in determining and understanding their own work history, potential, and work experiences. Application of situational tasks, job tryouts, and simulated work experiences in vocational evaluation. Clinical interpretation of data through formal staff conference, vocational counseling, and report writing.

538 Disability Management (3) Process principles and techniques used to assist individuals in determining and understanding their own work history, potential, and work experiences. Application of educational programs and jobs in which an individual may be employed. Selection and application of relevant psychological principles and techniques to assist in vocational evaluation.

541 Psychosocial Aspects of Disability (3) Psychosocial impact of disability on person and family. Reaction to loss, coping with disability, and societal rehabilitation.

543 Medical Aspects of Disability (3) Etiology and clinical symptoms related to disabling conditions served by special education and rehabilitation personnel. Restrictive measures to eliminate or minimize resulting handicaps. Skills necessary to communicate with lay and professional persons.

545 The Rehabilitation Interview (3) Interview as used in assessment and planning with people who have disabilities and vocational handicaps. Number of sessions needed to determine individual vocational potential.

546 Practicum in Rehabilitation (3) Supervised experience in area of rehabilitation; application of concepts, principles, and skills. Prereq: Consent of instructor.

549 Internship in Rehabilitation Counseling (12) Supervised practicum in rehabilitation counseling. Full time clinical experience for second year students (600 clock hrs required).

579 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 9 hrs. S/N only. E

591 Clinical Studies (1) Relationship between educational theory and application during internship: research project, development of portfolio, and capstone experience.

592 Assistive Technology in Special Education and Vocational Rehabilitation (3) Technology as applied to needs of students with disabilities and post-secondary age students/clients. Delivery of assistive technology services; software programs and assistive devices; delivery systems, interdisciplinary evaluation/ planning, and funding issues.

603 Seminar in Research Special Education and Rehabilitation (3) Development and implementation of research. Independent research studies. Research proposal. Prereq: 9 hrs of research core and consent of instructor.

604 Seminar in Research in Special Education and Rehabilitation (3) Seminar in rehabilitation counseling. Prereq: Admission to doctoral program or consent of instructor.

620 Internship in Research Special Education and Rehabilitation (3) Practicum in rehabilitation counseling. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/N only.

639 Internship in Research in Special Education and Rehabilitation (3) Practicum in rehabilitation counseling. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/N only.

679 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 9 hrs. S/N only.

693 Independent Study (1-3) May be repeated. S/N or letter grade. E

Ecology and Evolutionary Biology

MAJOR

DEGREES

Ecology and Evolutionary Biology . M.S., Ph.D.

T. G. Hallam, Head
C. R. B. Boake, Associate Head

Professors:
Boake, C. R. B., Ph.D. ....................... Cornell
Bunting, D. L., Ph.D. ....................... Oklahoma State
Burghardt, G. M., Ph.D. ................... Chicago
Delcourt, H., Ph.D. ......................... Minnesota
Delcourt, P. A., Ph.D. ....................... Minnesota
Echternacht, A. C., Ph.D. ................. Kansas
Ettrier, D. A., Ph.D. ........................ Minnesota
Greenberg, N. B., Ph.D. ................... Rutgers
Gross, L. J., Ph.D. ............................ Cornell
Hallam, T. G., Ph.D. ....................... Missouri
Harris, W. F., Ph.D. .......................... Tennessee
McCormick, J. F. (Emeritus), Ph.D. .... Emory
These courses or course sequences will be year of general chemistry, one year of biology, two years of chemistry including one sciences. They are expected to have Spring semesters. Applications incomplete as wishing to enroll in the following Fall or materials is The deadline for receipt of all application with a major in Ecology and Evolutionary graduate program which offers the Master ofary Biology administers an interdisciplinary National Laboratory, the National Biological Research Associate Professor:

Cruzan, M. B. C., Ph.D..............SUNY (Stony Brook)

Associate Professors:

Amundsen, C. C., Ph.D..............Colorado
Drake, J. A., Ph.D.....................Purdue

Research Associate Professor:

Grebmiller, J. M., Ph.D..............Alaska

Shared faculty are drawn from other University departments, the Oak Ridge National Laboratory, the National Biological Service, and the Tennessee Valley Authority.

The Department of Ecology and Evolutionary Biology administers an interdisciplinary graduate program which offers the Master of Science and Doctor of Philosophy degrees with a major in Ecology and Evolutionary Biology and concentrations in behavior, ecology (including mathematical ecology) and evolutionary biology.

REQUIREMENTS FOR ADMISSION

Applications are accepted once a year. The deadline for receipt of all application materials is 6 January for those applicants wishing to enroll in the following Fall or Spring semesters. Applications incomplete as of that date, or received after that date, will not be considered. Applicants are expected to have an academic background consistent with a Bachelor's degree in one of the life sciences. They are expected to have completed a minimum of one year of general biology, two years of chemistry including one year of general chemistry, one year of physics, and one year of college-level calculus. Occasionally, applicants who are highly qualified otherwise but lack one of these courses or course sequences will be admitted with some conditions that the deficiency will be made up within the first year of graduate study. Applicants are required to submit scores from the general Graduate Record Examination (GRE) and successful applicants will usually have a composite score on the verbal, mathematical and analytical sections of the GRE of at least 1650. Submission of scores on appropriate (e.g., biology, mathematics) advanced GRE examinations is recommended but not required. Applicants are also expected to have an overall grade-point average of at least 3.0, and 2.7 or above for all science and mathematics courses, on a 4.0 scale (successful applicants will usually have grade-point averages well above these minima).

Application must be made to both The Graduate School and the department. The departmental application requires 3 letters of reference from persons capable of assessing the applicant's suitability for graduate work in biology and a statement of professional goals and reasons for applying to this program. Applicants for the doctoral degree are expected to have made prior contact with potential research advisors in the department's graduate program and this approach is recommended for applicants for the Master's degree program as well. Inquiries should be directed to the Chair, Graduate Affairs Committee, Department of Ecology and Evolutionary Biology, The University of Tennessee, Knoxville, TN 37996-1610.

THE MASTER'S PROGRAMS

In addition to general requirements of the Graduate School, aspirations for the Master of Science degree are expected to: (1) during the first semester in residence, take a prescriptive diagnostic examination covering major concepts in ecology and evolutionary biology. The examination may be taken twice and must be passed before the student is admitted to candidacy; (2) complete course requirements as determined by the department and the student's faculty thesis research committee; and (3) satisfactorily complete and defend a research thesis.

THE DOCTORAL PROGRAMS

In addition to general requirements of the Graduate School, aspirants for the Doctor of Philosophy degree are expected to: (1) during the first semester in residence, take a prescriptive diagnostic examination covering major concepts in ecology and evolutionary biology. The examination may be taken twice and must be passed before the student is admitted to candidacy; (2) complete course requirements as determined by the department and the student's faculty dissertation research committee; and (3) satisfactorily complete and defend a dissertation. The department does not require a reading knowledge of a foreign language, but this may be imposed by the student's faculty dissertation research committee. If so, the student has the option of demonstrating reading knowledge of the prescribed language by either (a) passing the official reading examination given by the language department or (b) earning a grade of at least a B in the second semester of a special language reading course for graduate students.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give graduate students the opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>403</td>
<td>Plant Evolution (3) (Same as Botany 403.)</td>
</tr>
<tr>
<td>411-12</td>
<td>Minicourse in Ecology and Evolutionary Biology (2) Selected advanced topics in ecology, behavior, and evolutionary biology, concentrated in time and subject matter. Consult departmental listing for topics offered. Prereq: As announced. May be repeated. Maximum 4 hrs may apply toward department major.</td>
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431 Plant Ecology (4) (Same as Botany 431.)

446 Introduction to Oceanography (4) Basic oceanography: physical, chemical, geological and biological processes and patterns. Oceanic subsystems: upwellings, polar oceans, hydrothermal vents, gyres, coral reefs, estuaries, and coastal regions. Field trip to coast required. Prereq: General Biology and General Chemistry. General Ecology recommended.

450 Comparative Animal Behavior (3) Principles and methods of ethology: ecological, developmental, physiological, and evolutionary aspects. (Same as Psychology 450.)

459 Comparative Animal Behavior Laboratory (3) Introduction to observational and experimental research in ethology. Coreq: 450. (Same as Psychology 450.)


461 Special Topics In Organismal Biology (3) Ecology, evolution, biogeography, classification, and anatomy of selected animal and plant taxa. Prereq: General Ecology or consent of instructor.

470 Aquatic Ecology (3) Introduction to the physicochemical nature of inland waters with description of biotic communities and their interrelationships. Prereq: General Chemistry and General Ecology. 2 hrs and 1 lab.


484 Conservation Biology (3) Application of principles and techniques of ecological research to conservation of biodiversity at genetic, population, community, and ecosystem levels. Prereq: General Genetics and General Ecology.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-12) Required of the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Ecology and Evolutionary Biology Seminar (1) Advanced topics in ecology, behavior, and evolutionary biology. Senior departmental majors encouraged. Required of all first- and second-year graduate students. May be repeated. Maximum 4 hrs. S/NC only.

504 Special Topics (1-3) Selected directed readings or special course in topics of current interest. Consult departmental listing for offerings. May be repeated with consent of instructor. Maximum 3 hrs. S/NC only.

505 Basic Concepts in Organic Evolution (3) Processes and patterns in organic evolution. Prereq: Admission to program in Ecology and Evolutionary Biology. Required of all first-year students. F

507 Basic Concepts in Ecology (3) Contemporary issues in ecology. Prereq: Admission to program in Ecology and Evolutionary Biology. Required of all first-year students. Sp

508 Introduction to Faculty Research (1) Orientation of new graduate students to current research of departmental graduate faculty. Prereq: Admission to program in Ecology and Evolutionary Biology. Required of all first-year students. S/NC only.

509 Foundations: Readings in Ecology (1-2) Readings and discussion of classic papers in field.

511 Foundations: Readings in Evolution (1-2) Readings and discussion of classic papers in field.

513 Foundations: Readings in Behavior (1-2) Readings and discussion of classic papers in field.
515 Foundations: Readings in Environmental Toxicology (1-2) Readings and discussion of classic papers in field.

516 Colloquium in Ethology (1) (Same as Psychology 516.)

520 Ecology for Planners and Engineers (3) Ecological principles and their application to environmental problems. Prerequisites: Consent of instructor. Recommended for students in Environmental Engineering.

524 Physiological Ecology of Animals (3) Comparative physiological response of animals to changing environmental conditions. Prerequisites: Consent of instructor.

535 Ecology and Development in the Amazon (3) Natural history, ecosystem diversity and function, and opportunities for sustainable economic development in the Amazon Basin. Field trips to places of interest.

540 Insect Taxonomy I: Major Orders (3) Survey of classification of major orders of insects, with practical experience in identification of insects at family level. Prerequisite: Consent of instructor. 4 hours lecture and lab.

541 Insect Taxonomy II: Minor Orders (3) Survey of classification of minor orders of insects, with practical experience in identification of insects at family level. Prerequisite: Consent of 540 or consent of instructor. 4 hours lecture and lab.

542 Insect Structure and Function (3) Integrated study of insect morphology and physiology at cellular level. Prerequisite: Consent of instructor.

543 Aquatic Insects (3) Taxonomy and biology of aquatic insects; immature forms. Prerequisite: Consent of instructor. 2 hours lecture and 1 lab.

544 Fresh Water Invertebrate Zoology (3) Ecology and taxonomy of fresh water invertebrates exclusive of insects. Prerequisite: Comparative Invertebrate Biology or equivalent and consent of instructor. 3 hours lecture and 1 lab.

545 Advanced Animal Behavior (3) Second-level course in ethology, stressing evolution, genetics, physiology, ecology, and human behavior. Prerequisites: Consent of instructor. 3 hours lecture and field study.

551 Zoogeography (3) Processes determining geographic distribution of animals and distribution and composition of animal communities. Prerequisite: Consent of instructor.

555 Environmental Planning (3) (Same as Planning Behavior (3) (Same as Psychology 547.) Includes study of animal behavior, population dynamics, and decision-making. Prerequisites: Consent of instructor. 4 hours lecture and lab.

561 Environmental Toxicology (3) Basic concepts in toxicology; molecular toxicology and detoxification; bioaccumulation, metabolism, excretion, and persistence of pollutants. Prerequisites: Consent of instructor. 3 hours lecture and 2 hours lab.

570 Mathematical Ecology (3) Mathematical modeling of biological systems. Prerequisite: Consent of instructor.

575 Ecological Genetics (3) Genetics of natural populations, using both single-locus and quantitative genetic approaches. Prerequisite: Consent of instructor.

577 Landscape Ecology (3) Ecological structure, function, and change through time of landscape mosaics: quantitative measures of landscape heterogeneity; response of organisms to changes in landscape heterogeneity. Prerequisite: General Ecology or equivalent of consent of instructor.

581-582 Mathematical Ecology (3,3) (Same as Mathematics 581-582.)

583 Zoogeography (3) Processes determining geographic distribution of animals and distribution and composition of animal communities. Prerequisite: Ecology course or consent of instructor.

585 Mathematical Evolutionary Theory (3) (Same as Mathematics 583.)

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

600 Doctoral Research and Dissertation (3-15) P/NP only. E

601 Advanced Topics (1-3) Readings and discussion of recent advances. Consent of departmental field for offerings. May be repeated with consent of department. Maximum 9 hrs.

604 Current Topics in Environmental Toxicology (1) Critical reviews of research problems and methods in environmental toxicology, behavioral toxicology, biological and toxicological effects, biochemistry and epidemiology. Prerequisites: Consent of instructor. 3 hours lecture and 1 lab.

635 Environmental Assessment and Sustainable Development in Third World Countries (3) Concepts and methods of environmental impact assessment and risk assessment. Sustainable development concepts and issues in developing countries. Prerequisites: General Ecology or equivalent. (Same as Biology 635 and Planning 635.)

681-682 Advanced Mathematical Ecology (3,3) (Same as Mathematics 681-682.)

Academic Standards

Economics

(College of Business Administration)

MAJORS

Economics ................. M.A., Ph.D.
Business Administration ............. MBA

Matthew N. Murray, Head

Professors

Bohn, Robert A., Ph.D. ................. Washington (St. Louis)
Bowley, Roger L. (Emeritus), Ph.D. ....... Texas
Carroll, Sidney L., Ph.D. .......... Harvard
Chang, Hui S., Ph.D. .............. Vanderbilt
Clark, Don P., Ph.D. ............ Michigan State
Cole, William E. (Emeritus), Ph.D. ....... Texas
Davidson, Paul J. (Fred Holly Chair of Excellence), Ph.D. .......... Pennsylvania
Davidson, Paul J. (Emeritus), Ph.D. .......... Texas
Lee, Feng-Yao (Emeritus), Ph.D. .......... Texas
Moore, John R. (Distinguished Prof.), Cornell
Murray, M. N., Ph.D. .......... Syracuse
Neal, Walter C. (Emeritus), Ph.D. .......... London
Russell, Milton (Emeritus), Ph.D. .......... Oklahoma
Schlottman, Alan M., Ph.D. .......... Washington (St. Louis)
Simpson, George A. (Emeritus), Ph.D. .......... Texas

Associate Professors

Gauger, Jean A., Ph.D. .......... Iowa State
Glustof, Errol, Ph.D. .......... Stanford
Kahn, James R., Ph.D. .......... Maryland

Assistant Professors

Bruce, Donald, Ph.D. .......... Syracuse
Fallahattaneh, Dino
Fox, William F., Ph.D. .......... Ohio State

ENROLLMENT BY DEGREE

Ph.D. .......... Washington (St. Louis)
Santore, Rudy, Ph.D. .......... Ohio State
Stango, Victor O., Ph.D. .......... California (Davis)
Stanley, Denise L., Ph.D. .......... Wisconsin
Stewart, Steven W., Ph.D. .......... New Mexico

The Department of Economics offers graduate programs leading to the M.A. and Ph.D. The M.A. may be completed by either a thesis or non-thesis option, while the Ph.D. requires successful completion of a dissertation. Applicants to these programs should contact the Director of Graduate Studies, Department of Economics, for further information. The Department also offers an area of concentration for the MBA degree. Students interested in the MBA program should contact the Director of Graduate Business Programs, College of Business Administration.

Academic Standards

Economics

Graduate students in good academic standing have the right to petition the department for modification of departmental degree requirements and redress of grievances. Petitions must be in writing and addressed to the Director of Graduate Studies.

The Master's Program

Admission to the M.A. program is based on undergraduate academic performance and on scores from the general portion of the GRE. The student may choose either the thesis or non-thesis option. The non-thesis option requires 30 hours of coursework at the 400 level or above. Of these, at least 24 hours (at least 18 hours of which are in economics) must be at the 500 level or above. Of the minimum of 18 hours in economics at the 500 level or above, 12
hours must consist of 511, 512 and 513, 514, and the remaining 6 hours must be in one field of economics. Of the 30 hours, a maximum of 9 hours in courses approved by the department may be taken in fields other than economics. Students electing the nonthesis option are required to pass a final comprehensive examination.

The thesis option requires 30 hours of coursework at the 400 level or above, including at least 24 hours at the 500 level or above, 6 hours of which may be thesis hours. Of the remaining 18 hours at the 500 level or above, at least 15 hours must be in economics and must include 511, 512, 513, and 514. A maximum of 6 hours may be in an area other than economics.

THE DOCTORAL PROGRAM

Admission to the Ph.D. program is based on promise of outstanding scholarship as demonstrated by previous academic performance, by scores achieved on the general portion of the GRE, and by recommendations from the applicants. The program requires a minimum of 48 hours of coursework beyond the bachelor's degree or 24 hours beyond the master's degree, at least 24 hours of 500 Doctoral Research and Dissertation, and successful completion of the following:

1. Students are required to complete the following core requirements:
   a. Economic Theory: Microeconomic theory and macroeconomic theory by a qualifying exam taken not later than the beginning of the fourth semester of study.
   b. History of Economics: Completion of 515 or 615 with a grade of B or better, or by qualifying examination.
   c. Quantitative Methods: Completion of 581, 582 and 583 with grades of B or better, or by qualifying examination.

2. Students failing a qualifying examination must retake the examination the next time offered. A qualifying examination may be taken a third time only with approval of the department. Failing a qualifying examination for a third time will result in dismissal from the doctoral program.

3. Students are required to demonstrate competence in a comprehensive examination in at least two fields of specialization in economics. Students failing a comprehensive examination must retake the examination the next time offered. A comprehensive examination in a specific field may be taken a third time only with approval of the department.

4. Students are required to complete a doctoral dissertation and to defend it successfully before the faculty.

MINOR IN ENVIRONMENTAL POLICY

The program is designed to give master's and doctoral level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. While administered through the Economics Department, the program is coordinated by a committee of representatives from the following participating departments and programs: Agricultural Economics and Rural Sociology, Botany, Civil and Environmental Engineering; Ecology and Evolutionary Biology; Economics; Forestry, Wildlife and Fisheries; Geography; Management; Planning; Political Science; and Sociology. Students may request admission to the minor following admission to a graduate program in one of the participating departments. Students in good standing in one of these programs may apply for admission to the minor in environmental policy. The coordinating committee will consider the admission of interested students. Applicants should have a background in both natural and social sciences evidenced by prior coursework or experience. One course in environmental science is required. Each major discipline and one course in quantitative methods are required. These requirements may be fulfilled before or after admission to the minor. All students admitted to the minor will be required to register for at least three hours of Economics 579, Environmental Policy Research Workshop, and to complete successfully the following:

1. Ecology and Evolutionary Biology 520 or Plant and Soil Sciences 414 or Geography 433 or an equivalent course approved by the coordinating committee.

2. Six hours of coursework outside the major discipline approved by the coordinating committee.

Doctoral students seeking a minor in environmental policy must also complete, in addition to the above, a policy-relevant dissertation approved by the coordinating committee.

BUSINESS ADMINISTRATION CONCENTRATION

For complete listing of MBA program requirements, see Business Administration. MBA Concentration: Economics.

Minimum course requirements are as approved by the area MBA faculty advisor.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The Ph.D. program is available to residents of the state of Kentucky. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

400 Special Topics (3) Topics vary. Prereq: Determined by department. May be repeated.

413 Macroeconomic Fluctuations (3) Analysis of historical data, methods of analyzing macro-economic fluctuations, theoretical explanation of cycles, and role of monetary and fiscal policies in aggregate economy. Major writing requirement. Prereq: Intermediate Macroeconomics or consent of instructor.

415 History of Economics (3) Same as History 415.

424 Political Economy of World Development (3) Topics vary: Latin America, Asia, Soviet Union and East Europe. Analysis of major economic strategies, political problems. Prereq: 400. This course includes a major writing requirement. May be repeated when topic varies. Maximum 9 hrs.


462 Economics of Resources and Environmental Policy (3) Economic analysis of environmental policy and allocation of resources. Benefits and costs of development of natural resources; utility, interest, and growth on environment. Major writing requirement. Prereq: 201.

471 Public Finance: Optimal Government Functions and Expenditure Analysis (3) Problems of selective consumption, external effects, public investment, social decision making. Major writing requirement. Prereq: 201.

472 Public Finance: Taxation and Intergovernmental Relations (3) Analysis of personal and corporate income, property as sources of revenue, fiscal federalism. Major writing requirement. Prereq: 201.

482 Introduction to Mathematical Economics (3) Application of basic mathematical tools: calculus, matrices, etc. to economic analysis. Major writing requirement. Prereq: Intermediate Microeconomics with B or better and Calculus.

500 Thesis (1-15) P/N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

511-12 Microeconomic Theory (3,3) Theory of consumer choice and demand, theory of rationed preference, attributes of goods and services, price, market demand, labor supply, individual behavior under uncertainty, theory of firm, theory of production and cost, market structures, derived demand and factor pricing, introduction to welfare economics, market failure and theory of second best, pure exchange.

513-14 Macroeconomic Theory (3,3) Determination of national income, prices, and employment. Results using Keynesian, non-market-clearing, monetarist, and rational expectations paradigms.


525 Economic History of Europe (3) Nature and functioning of economic systems and policies in history of Western civilization, major issues of method and interpretation. Prereq: Graduate standing in economics or consent of instructor.

537 Managing in a Regulated Economy (3) Economic effects of antitrust, utility, international and environmental regulation on business. Development of decision-making skills in area of government-business relations.

577 Environmental Economics and Policy Management (3) Interdisciplinary perspective on goals of sustainable economic development and environmental quality. Development of decision-making tools and conflict resolution.


583 Econometric Techniques (3) Multivariate time series, panel data, limited dependent variable analysis applied to economic problems. Prereq: 582.

600 Doctoral Research and Dissertation (3-15) P/N only. E

92 Economics
613 Advanced Macroeconomic Theory (3) Prereq: 514 or equivalent.


621 International Economics (3) Comparative advantage, trade migration, commodity composition of trade, protectionist devices, protectionist arguments, trade liberalization, U.S. trade policy, exchange rate determination, balance of payments, and multinational corporations, and international capital flows. Prereq: 512 and 514.

623 Economic Development: Theories and Policies (3) Principal theories explaining economic behavior in developing countries and policies and strategies used to promote development. Prereq: Undergraduate degree in economics or consent of instructor.

624 Economic Development: Western Impact on Asia and Africa (3) Studies of consequences of contact between developed world and developing countries of Asia and Africa. Prereq: 21 hrs of upper division undergraduate social science or consent of instructor.


642 Labor History and Legislation (3) Development of organized labor as an important economic and political force in U.S. from Colonial times to present. Evolution of legal status of labor unions and of individual workers vis-à-vis their employers.

651 Monetary Theory (3) Study of money, credit, and liquidity as related to output determination, interest rates, employment, and prices. Prereq: 515.

652 Topics in Monetary Theory (3) Advanced monetary models, issues in monetary policy, open economy monetary theory and policy. Student participation. Prereq: 651.

661 Regional and Urban Location and Development Theory (3) Theory of industrial and agricultural location and human migration. Economic basis for land-use patterns, central places, and urban form. Spatial inequalities and urban problems. National policies for regional and urban assistance.

662 Methods of Regional and Urban Analysis (3) Theory of regional urban economic structure and growth. Regional income and product accounts, shift and share analysis, economic input-output models, and regional urban input-output models. Theory and problem solution.


672 Public Finance: Taxation and Intergovernmental Relations (3) Theory of taxation; tax incidence and tax efficiency; policy analysis of U.S. tax structure at federal, state, and local levels. Theory of fiscal federalism and intergovernmental relations.

677 Environmental and Natural Resource Economics (3) Alternative paradigms for allocating and valuing environmental resources. Exploration of issues related to market failure and differences between renewable and nonrenewable resources.

678 Economics of Environmental Policy (3) Topics in environmental policy analysis. Consideration of alternative policy instruments, defining policy objectives and role of risk in decision-making process.

682 Econometric Methods (3) Advanced topics in econometrics. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

690 Workshop (3) Advanced topics in economics. Student participation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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### Education

**MAJORS**

**DEGREES**

- Counseling
- Deafness and Human Services
- Educational Administration and Cultural Studies
- Educational Psychology
- Exercise Science and Sport Management
- Instructional Technology, Curriculum and Evaluation

The College of Education offers the Master of Science, Educational Specialist, Doctor of Education, and Doctor of Philosophy degrees through six departments:

- Counseling
- Deafness and Human Services
- Educational Administration and Cultural Studies
- Educational Psychology
- Exercise Science and Sport Management
- Instructional Technology, Curriculum and Evaluation

For admission, most programs require current scores from the GRE general section, and all require a departmental application form and letters of recommendation as indicated on the chart of Majors and Degree Programs. For additional information about the various programs of study and admission, write to the Graduate Center in the College of Education, 214, The University of Tennessee, Knoxville, TN, 37996-3400, tel. (865) 974-0906, www.utk.edu/advising/advising.html.

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**THE MASTER'S PROGRAMS**

**College Student Personnel**

Students who major in College Student Personnel are prepared to enter the field of student personnel administration in colleges, universities, and community or junior colleges. The program has both a thesis and non-thesis option. A minimum of 36 hours, which includes 6 hours of practicum experience, is required in either option. Students must complete a minimum of 12 hours in Higher Education courses.

**Counseling**

The master's degree with a major in Counseling offers concentrations in:

- Mental health counseling
- Rehabilitation counseling
- School counseling

The program includes thesis and non-thesis options. The concentration in mental health counseling is fully accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP) and requires completion of 36 hours of coursework plus supervised practicum and internship experiences working with clients. The concentration in rehabilitation counseling is fully accredited by the Council on Rehabilitation Education, Inc. and requires 54 semester hours, including internship. A minimum of 12 hours of Rehabilitation and Deafness courses is required. The concentration in school counseling is fully accredited by the Council for Accreditation of Counseling and Related Educational Programs and requires 48 hours of coursework, including supervised practicum and internship experiences working with clients. A final examination is required of all students.

**Education**

The master's degree with a major in Education has two tracks. Track 1 is intended for students who are licensed to teach English, elementary education, foreign language, mathematics, natural science, social science, early childhood special education, or education of the deaf and hard of hearing. (Non-licensed applicants to Track 1 will be reviewed on a case-by-case basis and must have a strong background and professional goals which can be fostered through participation in this non-licensure program.) Track 2 is designed for students seeking initial teacher licensure in one of the above fields. Thesis and non-thesis options are available for both tracks.

**Track 1 - Concentrations are available in:**

- Art education
- Curriculum

**Track 2 - Concentrations are available in:**

- Education of the deaf and hard of hearing
- Elementary education
- English education
- Foreign language/ESL education
- Instructional technology
- Mathematics education
- Modified and comprehensive special education
- Reading education
- Science education
- Social foundations
- Social science education
- Special education: early childhood

The thesis option requires the completion of 30 hours, including 6 hours of Thesis 500. The non-thesis option requires the completion of 33 hours of coursework (36 hours for special education concentrations). Both options require a minimum of 12 hours in the major discipline (18 hours for special education concentration).

**Track 2 - Concentrations are available in:**

- An education with a major in Education of the deaf and hard of hearing
- Elementary teaching
- Modified and comprehensive special education
- Secondary teaching
- Special education: early childhood

The thesis option requires completion of 36 hours, plus 6 hours of Thesis 500 for a total of 42 hours. The non-thesis option requires 36 hours, including 24 hours of prescribed licensure coursework and 12 hours in the academic discipline as approved by the student's committee.

For both tracks, a comprehensive written examination is required. An oral exam is given over the thesis.

**Educational Administration and Policy Studies**

The master's degree program with a major in Educational Administration and Policy...
the unit. Courses are prerequisites to other courses in administration and supervision. A final oral examination is required for the thesis option, with an oral exam at the option of the committee. Students entering either of these options must complete the introductory core consisting of Educational Administration and Supervision 513, 515, 516, and 535 or a demonstrated computer proficiency. These courses are prerequisites to other courses in the unit.

Educational Psychology

The master's degree with a major in Educational Psychology is offered with concentrations in:

- Adult education
- Individual & collaborative learning Both programs include thesis and non-thesis options. The major in Educational Psychology requires 36 hours. The concentration in adult education requires a minimum of 12 hours in adult education courses. A final examination is required of all master's degree students.

Human Performance and Sport Studies

The master's degree with a major in Human Performance and Sport Studies offers concentrations in:

- Exercise science
- Sport management
- Sport studies Applicants must submit an admission application and 3 letters of recommendation. Both thesis and non-thesis options are available. The non-thesis option requires 32 hours, including a project, and a course in research design or an approved specialized research class. The thesis option requires the completion of 30 hours, including 6 hours of Thesis 500. Both options require a minimum of 12 hours of sport studies, exercise science, or sport management courses.

THE SPECIALIST IN EDUCATION PROGRAM

The Educational Specialist degree program with a major in Education encompasses concentrations in:

- Curriculum
- Educational administration & supervision
- Elementary education
- English education
- Foreign language/ESL education
- Instructional technology
- Mathematics education
- Reading education
- School counseling
- School psychology
- Science education
- Social science education

The instructional and curricular concentrations require completion of a minimum of 30 hours of coursework beyond the master's degree, including 6 hours in core courses, 18 hours in specialized courses, and 6 hours to be determined by the student's committee. The thesis option and supervision concentration requires the completion of a minimum of 60 hours beyond the baccalaureate, including a 6-hour cognate within or external to the college, and a highly recommended internship. Both thesis and non-thesis options are available. The school counseling concentration requires a minimum of 22 hours beyond the master's degree but not fewer than 60 hours beyond the baccalaureate, including practicum and internship experiences. The school psychology concentration requires the completion of a minimum of 66 semester hours beyond the baccalaureate. Refer to Degree Requirements under The Graduate School for complete program requirements.

THE DOCTOR OF PHILOSOPHY PROGRAM

The Ed.D. program with a major in Education is available in the following concentrations and specializations:

- Curriculum, educational research, and evaluation (curriculum, educational research, evaluation)
- Educational administration and policy studies (educational administration and supervision, higher education)
- Educational psychology (collaborative learning)
- Instructional technology (educational applications of technology)
- Literacy, language education, and ESL education (literacy, ESL education)
- Teacher education (elementary education, social science education, mathematics education)

In addition to the requirements of The Graduate School, the hour requirements in the curricular and instructional concentration areas are determined by the student's doctoral committee. A comprehensive examination and an oral examination on the dissertation are required. The concentration in educational psychology with a specialization in collaborative learning requires the completion of a minimum of 60 hours beyond the baccalaureate degree and incorporates a cohort model through which students participate in core courses as a group. This program offers an alternative residency which includes a two-year, on-campus, continuous enrollment in six to nine hours per semester including summers. During this time period, students are enrolled in a doctoral seminar (EP630) for four of the six semesters and participate with faculty on research teams for 12 of the required hours. Contact the program coordinator for additional information and program requirements.

Requirements

Research Area 15
General Core Requirements
Option A
- History and philosophy of education, (both areas must be represented) 4
- Learning theory and curriculum (both areas must be represented) 4
- Administrative/leadership theory 2
- Trans-college seminar: two consecutive semesters 2
Option B
- Philosophy of education 3
- History of education 3
- Administrative theory 3
- Learning theory 3
- Curriculum theory 3
- Trans-college seminar: two consecutive semesters 2
Option C
- Philosophy of science 3
Educational Administration and Cultural Studies

MAJORS

Study areas: M.S., Ed.S., Ed.D., Ph.D.

DEGREES

Programs in Educational Administration and Policy Studies offer the following degrees:

- M.S., Human Performance and Sport Studies
- M.S., Human Performance and Sport Studies

J. T. Desensi, Head

Professors:

Allison, C. B., Ph.D. ................. Oklahoma
Bogue, Grady, Ed.D. ................. Memphis State

Desensi, J. T. (Liaison), Ed.D. ........ North Carolina (Greensboro)
Howard, Robert (Emeritus), Ph.D. .... Ohio State
Malik, Anand, Ed.D. ................. Oklahoma
McNinch, Malcolm, Ph.D. ............. Columbia

Mead, B. J. (Emeritus), Ph.D. ........... Florida State
Mertz, Norma T., Ed.D. ............... Columbia
Morgan, W. J., Ph.D. ................. Minnesota
Paul, Joan, Ed.D. ............. Alabama
Phillips, Madge M. (Emeritus), Ph.D. .. Iowa
Ubben, Gerald C., Ph.D. ............. Minnesota
Wisniewski, Richard (Emeritus), Ed.D. .... Wayne State
Winstead, C. A., Ph.D. .............. Michigan

Associate Professors:

Aper, Jeffery P., Ph.D. ............... VPI
Fleming, Cynthia, Ph.D. ............. Duke

Assistant Professors:

Mangion Terry, Ph.D. ................. Buffalo
Wright, Hannel K., Ph.D. ............ Toronto

The Department of Educational Administration and Cultural Studies participates in graduate programs leading to degrees in:

- Master of Science
- College Student Personnel Education
- Educational Administration and Policy Studies
- Educational administration and supervision
- Human Performance and Sport Studies
- Master of Science

The College of Education Advising Center, CA 214, (865) 974-0907, or edcounselors@utk.edu.

MINOR IN GERONTOLOGY

Graduate students with majors/concentrations in counseling, exercise science, or educational psychology, may pursue a specialized minor in gerontology. This interdepartmental/interdisciplinary minor allows the student an opportunity to combine the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S. program in Counseling is available to residents of the states of Florida (concentration in rehabilitation counseling), or Kentucky (concentration in mental health counseling). The M.S. program in Education is available to residents of the states of Alabama, Arkansas, Kentucky, Maryland, South Carolina, Virginia, or West Virginia (concentration in education of the deaf and hard of hearing). The M.S. program in Human Performance and Sport Studies is available to residents of Alabama, Arkansas, Maryland, South Carolina, or Virginia. The Ed.D. program in Education (concentration in educational psychology) is available to residents of Kentucky. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

510 Advanced Educational and Clinical Procedures (3-6) Integration of advanced educational and clinical procedures: skills and knowledge for implementing instruction and for consulting with both persons in treatment of exceptional individuals. May be repeated. Maximum 6 hrs.

540 Topics in Improvement of Instruction (1-3) Special conferences, workshops, and in-service programs. May be repeated. Maximum 8 hrs. S/NC only.

562 Direction and Supervision of Student Teaching (3) Roles and responsibilities of cooperating teachers and student teacher; objectives and policies of student teaching program; elements of clinical supervision. May be repeated. Maximum 6 hrs.

568 Teacher-Parent-Community Relations (3) Techniques for effective relations between parents and teachers, examination of roles and expectations, parent involvement, volunteer programs. May be repeated. Maximum 6 hrs. S/NC only.

574 Analysis of Teaching for Professional Development (2) Strategies to document and analyze effectiveness of teaching and of professional development. May be repeated. Maximum 8 hrs. S/NC only.

575 Professional Internship in Teaching (1-8) Intensive teaching and teaching-related experiences in professional settings in public schools. Enroll limited to postgraduate students in a professional year program. May be repeated. Maximum 12 hrs. S/NC only.

597 Practicum in Classroom Teaching (1-4) Teaching and teaching-related experiences in elementary and secondary school settings. May be repeated. Maximum 12 hrs. S/NC only.

599 Field Experience (1-3) Application of curricular and instructional principles, methods, and materials in schools. May be repeated. Maximum 9 hrs. S/NC only.

601 Seminar (1) Introduction to Ph.D. program in Education; research requirements, meaning of scholarship in academic and educational institutions. May be repeated. Maximum 6 hrs. S/NC only.

635 Teacher Education in America (3) For students preparing to enter teacher education. May be repeated. Maximum 6 hrs. S/NC only.
See Education under Fields of Instruction for full description of all degree requirements. Programs in cultural studies, including those in the socio-cultural foundations of education and sport, derive their intellectual identity and orientation from disciplines such as anthropology, history, philosophy, psychology, and sociology, and from more specialized forms of inquiry such as ethnography, semiotic, literary theory, hermeneutics, linguistics, and feminist theory.

The faculty are devoted to interdisciplinary inquiry and seek to bring their disciplines to the forefront of students and faculty throughout the college. Knowledge is understanding divergent cultural contexts that shape beliefs, values and practices. The faculty examine critically the social practices, institutions, "helping" agencies, and other social sites where disenfranchised and marginalized groups struggle for greater control over their futures.

Programs in educational administration and in higher education focus on the preparation and development of administrative and instructional leaders who will serve in diverse settings for schools and colleges, community and human service agencies, adult and continuing education organizations, and educational units of government and corporate organizations.

A cohort based alternative approach to residence for the Doctor of Education degree program is offered. This alternative residence involves, among other requirements, a two-year, on-campus, continuous enrollment in Educational Administration and Policy Studies 606, Leadership Forum. Students must complete an additional three credits of coursework.

The annual admission deadline is March 15 for the master's programs. March 15 for the Ed. S. and doctoral programs, and March 15 for the master's programs.

Cultural Studies in Education

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E

501 Special Project (3) Cumulative experience for non-thesis major. Research study suitable for publication, or praxis requiring special written work. Prereq: 532.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester. Prereq: student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E


505 History of Olympics: Ancient and Modern (3) Examination of various aspects of ancient and modern Games. Ancient Olympics 776 BC to 393 AD. Panhellenic Games. Modern Olympics, 1896 to date: political, social class, gender, and economic issues that influence Games.


514 Advanced Philosophy of Sport (3) Major philosophical theories of sport. Various conceptual, moral, aesthetic, and social philosophical issues. E

515 Social Theories of Sport (3) Liberal, democratic, and Marxist social theories of sport. E

526 Philosophy of Education (3) Truth, knowledge, and valuation in relation to work of schools. F, Su

533 Psychology of Sport (3) Social psychological factors influencing behavior in sport setting. Discussion of contemporary theory, research, and methodology. Prereq: General psychology course or consent of instructor.

534 Motor Behavior and Skill Acquisition (3) Topical explanation and application of principles of human movement behavior to acquisition and performance of skills; discussion of current research and methodology.

539 Development of Education Thought (3) Historic and philosophical approach to living and writing of influential educators: Plato, Quinlinian, Comenius, Pedaceu, Pestalozzi, Dewey. Prereq: Graduate status and consent of instructor. Sp, Su

540 Foundations of Educational Policy (3) Relationship between theory, policy, and practice; educational policies that arise from philosophical and practical considerations relative to human nature, to educational purpose, to content of curriculum and to methods and techniques for conducting educational enterprises. F, Su

541 Special Topics (1-3) Advanced study in selected disciplinary or professional areas of physical education and sport. May be repeated.

542 Sociological Aspects of Sport (3) Social and cultural factors influencing sport physical and social education. Pertinent issues and research applications. Prereq: Consent of instructor. (Same as Sociology 542.)

546 Educational Sociology (3) Sociological analysis of American education system. Controversial social issues that affect educational system and potential solutions offered by various programs. Open to juniors, seniors, and graduate students. F, Su

548 Topics in History of Education (3) May be repeated. E

549 Topics in Philosophy of Education (3) May be repeated. F, Su

549 Topics in International Education (3) Historical, philosophical, and sociological foundations; selected nations and their cultures. May be repeated. E

550 Introduction to Qualitative Research in Education (3) Fundamentals of qualitative research methods and development of skills needed for qualitative research proposals. Overview of qualitative research methods. Prereq: Doctoral student in Education.

551 Motor Behavior and Skill Acquisition (3) Topical explanation and application of principles of human movement behavior to acquisition and performance of skills; discussion of current research and methodology.

552 Sociological Aspects of Sport (3) Social and cultural factors influencing sport physical and social education. Pertinent issues and research applications. Prereq: Consent of instructor. (Same as Sociology 542.)

556 Educational Sociology (3) Sociological analysis of American education system. Controversial social issues that affect educational system and potential solutions offered by various programs. Open to juniors, seniors, and graduate students. F, Su

558 Topics in History of Education (3) May be repeated. E

559 Topics in Philosophy of Education (3) May be repeated. F, Su


560 Introduction to Qualitative Research in Education (3) Fundamentals of qualitative research methods and development of skills needed for qualitative research proposals. Overview of qualitative research methods: ethnography, case study, hermeneutics, biographies, oral and life history. Critical reading and evaluation of qualitative research studies. F, Su

562 Advanced Studies in Educational Anthropology and/or Sociology (3) Ethnographic methods applied to formal and non-formal educational settings. Analysis of selected research in field. Prereq: 451, 2 courses in cultural anthropology, or consent of instructor. Sp.

563 Advanced Motor Behavior (3) In-depth analysis, synthesis, and discussion of contemporary theories and methodologies for knowledge and production in motor learning and sport psychology. May be repeated. Maximum 9 hrs. F, Su

568 Topics in Sociology of Education (3) May be repeated. Sp

572 Advanced Studies in Educational Anthropology and/or Sociology (3) Ethnographic methods applied to formal and non-formal educational settings. Analysis of selected research in field. Prereq: 451, 2 courses in cultural anthropology, or consent of instructor. Sp.

575 Special Topics (1-3) Study for doctoral students in selected aspects of cultural studies. May be repeated. Maximum 9 hrs. S/N or letter grade.

590 Cultural Studies Seminar (1) Two semester sequence (Fall and Spring); ongoing discussion about cultural issues: presentations, videos, and readings. Prereq: Admission to doctoral program with concentration in cultural studies in education. May be repeated. Maximum 4 hrs. S/N only.

591 Issues in Cultural Studies (3) Discourse, schools, and selected principal contemporary issues in field. Prereq: Admission to doctoral program with concentration in cultural studies in education.


593 Independent Study (1-3) May be repeated. S/N or letter grade.

594 Supervised Readings (1-3) May be repeated. S/N or letter grade.

595 Special Topics (1-3) Advanced study in selected aspects of cultural studies. May be repeated. Maximum 9 hrs. S/N or letter grade.
Educational Administration and Supervision

GRADUATE COURSES

513 Administrative and Organizational Theory in Education (3) Introduction to theoretical administrative and organizational foundations of management and leadership of educational programs and institutions. F, Su

515 Human Relations and Communication in Administration (3) Development and use of effective interpersonal communication skills and channels, intergroup relations, supportive work climates, personal motivation, conflict management skills, and role of values, attitudes, and expectations in administration. F, Su

516 Research for Educational Administration (3) Descriptive, experimental, and quasi-experimental designs to help students without quantitative backgrounds to read and understand technical professional literature. Introduction to inferential statistics, needs assessments, and evaluation procedures. S, Su

523 Administration of Special Services (3) Legal, programmatic, and ethical responsibilities of educational administrators in design and implementation of special education programs within school settings. Special learner characteristics, program categories, service delivery models, and legal/ethical frameworks. Inclusion and full service delivery.

529 Politics and Public Relations in Education (3) School/community relations in political context of modern, complex society. Administrator and supervisory competencies: political, social, ethnic, cultural, and racial environments in which schools operate. Prereq: M.S. introductory core or consent of instructor. F, Su

535 Administrative Applications of Micro Computers (3) DOS, word processing, data-based management, spreadsheet, and e-mail communications. Review and development of specific administrative applications: scheduling, attendance, student record systems, and accounting. F, Su

544 School Finance and Business Management (3) Financial and logical management tasks and procedures in individual school setting. Prereq: M.S. introductory core or consent of instructor. F, Su

547 Educational Facility Planning (3) Concepts and skills for development, evaluation, construction, renovation, maintenance, and operations of quality educational environments and facilities. Prereq: M.S. introductory core or consent of instructor. F, Su

548 Supervision and Personnel Administration (3) Basic supervisory and personnel concepts and related competencies: building of human-resource (micro-organizational) level; interviewing, personnel planning, collecting and maintaining employee information, supervision of instructional and non-instructional personnel, clinical supervision, staff evaluation, and staff development. Prereq: M.S. introductory core or consent of instructor. Sp, Su

553 Strategies of Educational Planning (3) Processes for improving decision-making function through use of both qualitative and quantitative planning techniques. Policy analysis, CPM, PERT, Delphi. Prereq: M.S. introductory core or consent of instructor. F, Su

564 Policy Issues in Educational Law, K-12 (3) Legal organization of case and statutory materials for public school administrators and teachers; problems concerning law and public education. Prereq: M.S. introductory core or consent of instructor. Sp, Su

580 Internship in Educational Administration (3) Field experience in selected areas in higher educational settings working directly with administrator. At end of planned program of study. Placement by department assignment. Prereq: Consent of instructor. May be repeated. S, NC or letter grade. F, Su

583 Educational Leadership—Principalship (3) Knowledge, skills and relationships for principal to be effective educational leader. Simulation materials and field-based activities. Culminating course with internships at end of planned course of study. Prereq: 21 hours in educational administration and supervision or consent of instructor. E

580 Internship in Educational Administration (3) Field experience in selected areas in higher educational settings working directly with administrator. At end of planned program of study. Placement by department assignment. Prereq: Consent of instructor. May be repeated. S, NC or letter grade. F, Sp

585 Seminar in School Leadership, K-12 (3) On-site study of quality school processes throughout region. Processes that make organizations "benchmarks of quality." Prereq: Consent of instructor. May be repeated. S, NC or letter grade. F, Sp

590 Special Topics (1-3) May be repeated. E

592 Field Problems in Educational Administration and Supervision (3) Topics to be assigned. May be repeated. S, NC or letter grade. E

595 Seminar in School Leadership, K-12 (3) On-site study of school processes throughout region. Processes that make organizations "benchmarks of quality." Prereq: Consent of instructor. May be repeated. S, NC or letter grade. F, Sp

605 Advanced Seminar in Administrative Theory (3) Interdisciplinary seminar. Readings selected by faculty for research and scholarly value from early to contemporary literature in administrative and organizational theory. Required of Ph.D. students in education. Prereq: Doctoral study courses with internships at end of planned course of study. Prereq: 21 hours in educational administration and supervision or consent of instructor. E

610 Internship in Educational Administration (3) Opportunity for doctoral students and advanced graduate students to gain experience in performance of critical tasks of educational administration under supervision of practitioner and University representative. May be repeated at discretion of student's committee. Maximum 12 hrs. S, NC only. E

614 Statistics for Educational Administrators (3) Descriptive and inferential research methods, parametric and non-parametric statistical techniques used in research in educational settings. F

615 Research Designs (3) Statistical methods through multi-variate techniques and applications to various research designs. Prereq: 614 or consent of instructor. Sp

616 Research Methods (3) Overview of descriptive and experimental research designs: data collection, analysis, and interpretation for survey studies and school survey instruments. Prereq: Basic statistics and computer skills consent of instructor. E

620 Seminar in Policy Issues in Education (3) Local, state, and federal education policy: theory analysis, development, and implementation. Why education policy changes rapidly, ways to follow and influence education policy, and conceptual frameworks to use for future understanding. Prereq: 529, 616 or equivalent or consent of instructor. F

646 School Personnel Administration (3) Personnel administration functions for professional and supporting staff in educational organizations. Recruitment, selection, placement, personnel policies, financial management and operation of personnel. Prereq: 548 or consent of instructor. F, Su

655 State-Federal Relations in Education (3) Interrelationships of federal, state, and local responsibilities and organizations for education by analysis of traditional, legal, fiscal and functional aspects of federal and state government. Prereq: 548 or consent of instructor. F, Su

660 Administration of Complex Organizations (3) Concepts and technological frameworks to understand, analyze, evaluate, and change complex educational program and institutional organizations. Prereq: 529 or consent of instructor. Sp, Su

670 Values and Ethics in Educational Leadership (3) Exploration of the personal and professional values of educational leaders and the moral and ethical issues they face. Prereq: Consent of instructor. May be repeated. E

680 Administration of Complex Organizations (3) Concepts and technological frameworks to understand, analyze, evaluate, and change complex educational program and institutional organizations. Prereq: 529 or consent of instructor. Sp, Su

690 Special Topics (1-3) May be repeated. E

Higher Education

GRADUATE COURSES

530 Special Topics (1-3) May be repeated. E

534 Program Evaluation in Education (3) (Same as Instructional Technology, Curriculum and Evaluation 584.)

536 Policy Issues in Higher Education Quality Assurance (3) Exploration of historic and contemporary approaches to definition and demonstration of quality in higher education and examination of contemporary issues related to quality assurance in colleges and universities.

537 Student Assessment in Higher Education (3) Outcome assessment in American higher education: origins of assessment policies, rationales for assessment, policy and practice, constructs and outcomes typically assessed, methods for conducting assessment, and uses of assessment data. Philosophies, priorities, and values, recent assessment efforts in higher education.

542 The College Student and the Court (3) Legal precedent affecting student personnel services in public higher education. Student discipline, housing, marriage, organizations, activities fees, tuition and related federal regulations.

543 American Higher Education in Transition (3) Philosophy, political, social, ethic, and cultural foundations of American higher education. Historical, structural, and organizational perspective. Functional areas comprising field and major issues.

570 Student Affairs Administration in Higher Education (3) Theoretical framework of college student personnel services and practical application of theory in student services environment. Applicable administrative theory, human development theory, relationship counseling, and evaluation techniques.

572 Student Development Theory and Practice in Higher Education (3) Theoretical framework of college student personnel services and practical application of theory in student services environment. Applicable administrative theory, human development theory, and evaluation assessment techniques.
Educational Psychology 

College of Education

MAJORS

DEGREES

Education ........................................... Ed.S., Ed.D., Ph.D.

Educational Psychology .......................... M.S.

R. S. McCallum, Head

Professors:

Bellon, Jerry J. (Emeritus), Ed.D. UC Berkeley

Brockett, Ralph G., Ph.D. ...................... Syracuse University

Greenberg, Katherine H., Ph.D. .................. Oklahoma State University

George, Thomas W., Ed.D. ...................... Tennessee State University

Dickinson, Donald J. (Emeritus), Ed.D. UC Berkeley

McCallum, R. S., Ph.D. ......................... George Peabody College

Peters, John M., Ed.D. ............................. North Carolina State University

Skinner, Christopher H., Ph.D. .............. Lehigh University

Williams, R. L. (Liaison), Ph.D. .............. George Peabody College

Associate Professor:

Kindall, Luther M., Ed.D. ...................... Tennessee State University

The Department of Educational Psychology offers graduate programs leading to degrees, majors, and concentrations in:

- Master of Science in Educational Psychology
- Doctor of Education in Educational Psychology

Admission Requirements

Admission requirements include completion of all items in the department's admissions packet and three letters of recommendation. Up-to-date GRE scores are required for application to all degree programs except the master's program. For all doctoral programs, a writing sample is also required.

GRADUATE COURSES

432 The Disadvantaged Student: Psychoeducational Perspectives (3) Theory and research regarding child and adolescent social behavior and appropriate interventions. Sp

460 Self-Management in the Helping Professions (3) Applications of self-management strategies to social, emotional, and health domains for helping professionals and their clients. Prereq: introductory course in psychology or consent of instructor. S/NC or letter grade. F, Su

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student chooses to use University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Problems in lieu of Thesis (2-3) May be repeated. Maximum 9 hrs. S/NC only. E

504 Special Topics (1-3) Instructor-initiated course offered at convenience of student. Prereq: consent of course. May be repeated. Maximum 15 hrs. S/NC or letter grade. E

509 Internship in Adult Education (3) Practical field experience in selected settings under supervision of practitioner and departmental representative. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

510 Psychological Theories of Human Development (3) Theories of human development emphasizing the interdependence of biological, emotional, cognitive, and social factors in the development of the individual. Prerequisites: Consent of instructor. F, Su

513 Reflective Practice in Education and Psychology (3) Concepts, theories and processes of reflective practice applied to educational settings. E

514 Individual Study in Adult Education (3) Prereq: Consent of supervising instructor. Approval form must be completed in office of unit head. May be repeated. Maximum 6 hrs. E

515 Educational Applications of Behavioral Theories of Learning (3) Behavioral theories and research, conditioning, observational learning, and ethical learning as systems applied to student motivation, discipline and learning. Su

516 Educational Applications of Cognitive Learning Theories (3) Cognitive theory and research, social learning, attribution and information processing as applied to education. Su

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Survey of Adult Education (3) Historical development of adult education, philosophies of adult education, agencies, associations, programs, issues, and literature illustrating process of adult education and diversity of continuing education. Prereq: Consent of instructor. F, Su

521 Program Development and Operation in Adult Education (3) Theories and methods from research to practice in planning and operating adult education programs. Prereq: Consent of instructor. F, Su

522 Adult Development (3) Theory and research in adult development and changes over lifespan and its implications for adult learning in formal and informal contexts. F, Su

523 Post-Secondary Education for Adults (3) History, evolution, philosophy, structure and functions of post-secondary, sub-university institutions, their programs and clientele. Prereq: Consent of instructor.

524 Continuing Professional Education (3) Theories and concepts supporting design and management of educational programs for adults in professions. Prereq: 520 or equivalent.

525 Characteristics of Adult Learners (3) Key characteristics of adult learners; current history and research on adult learning, and implications for teaching and learning concepts. Sp, Su


527 Controversies in Adult Education (3) Contemporary controversies confronting field of adult education; development of critical analysis skills by looking at controversies from different perspectives. Sp

528 Psychology of Aging (3) Theory and research on aging and gerontology related issues: psychological and sociocultural perspectives, psychological perspectives on aging and changes that occur in later life stages of human development. Implications for treatment programs and policy. Sp
529 Facilitating Adult Learning (3) Theory, research, and practice related to working with adults in teaching-learning situations. Sp, Su

530 Methods of Collaborative Inquiry (3) Philosophical and theoretical frameworks for designing and conducting collaborative inquiry projects. Practice in conducting research. Sp

540 Seminar in School Psychology (3) Essentials of theory and practice of school psychology as a professional specialty. Consideration of history and current issues in school psychology. Sp

541 Psychoeducational Assessment (3) Direct, psychometric and naturalistic assessment methods in learning environments. Prereq: Admission to school psychology program or consent of instructor, and Counselor Education and Counseling Psychology 525 or equivalent. May be repeated. Maximum 6 hrs. F, Sp

542 Practicum in Psychoeducational Assessment (3) Application of assessment skills to clients in learning environments. Coreq: 541 or consent of instructor. May be repeated. Maximum 6 hrs. S/NC only. F, Sp

543 Psychoeducational Consultation (3) Use of two and three-person models of consultation in educational and therapeutic settings based on behavioral, ecological, social learning and cognitive-behavioral theories. F

546 Practicum in Consultation (3) Application of consultation skills to educational settings. Prereq: 545, Sp

549 Internship in School Psychology (1-6) Supervised fieldwork in approved school psychology internship sites. Prereq: Enrollment in school psychology program and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only. E

560 Discipline and Conflict Resolution (3) Application of major models of discipline and conflict resolution strategies to development of constructive atmospheres for classroom learning. Sp

572 Cognitive Education: Models and Approaches (3) Models and approaches in field of cognitive education: research and theoretical support for various program components, critical variables of organizational learning that affect success of implementation. Sp

573 Meeting Needs of Nontraditional and Underachieving Learners (3) Exploration of students' needs at any age and level of functioning who are not progressing up to their fullest potential. Causes of academic and motivational problems, and approaches to overcome them, team, cultural alienation, and personal world view and interaction with effective teaching and learning. Su

574 Facilitating Group Change (3) Practical issues of group change. Analyses of group and individual experiences in various types of educational settings in relation to systems theory and collaborative learning theory. Needs of individuals and groups involved in change and roles of inside and outside change agents. F, Su


593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

600 Doctoral Research and Dissertation (3-15) P/ NP only. E

602 Directed Research (1-3) Instructor- or student-initiated group investigation of empirical and theoretical problems in educational and counseling psychology. May be repeated. Maximum 12 hrs. S/NC only. E

604 Special Topics (1-3) Instructor-initiated courses offered at convenience of unit on topics of interest. May be repeated. Maximum 15 hrs. S/NC or letter grade. E

606 Advanced Seminar in Curriculum and Learning (3) Team-taught interdisciplinary seminar; trends, themes, and issues in curriculum and learning. Reading and discussions based on significant research and scholarly publications. Sp

612 Modes of Inquiry (3) (Same as Educational Administration and Policy Studies 612)

620 Seminar in Adult Education (3) Issues in adult education, theories and concepts, philosophical positions, research trends and methodologies. Prereq: 520 or equivalent. F

621 Advanced Seminar in Program Planning (3) Concepts, principles, and theories related to program planning in adult education. Prereq: 521 or equivalent. Sp

622 Advanced Seminar in Adult Development and Learning (3) Adult development and adult learning theory and research. Prereq: 522, 525 or equivalent. F, Sp


635 Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Counselor Education and Counseling Psychology 635.) F

649 Advanced Internship in Psychology (1-8) Supervised experience in psychology in unit-approved internship sites for doctoral level students. Prereq: Enrollment in doctoral level psychology program and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

650 Professional Practice in School Psychology (1) Field setting to facilitate academic, social and interpersonal development of children and adults. School and mental health settings for intervention, consultation, prevention and assessment. May be repeated. Maximum 9 hrs. S/NC only. F, Sp

655 Research in Psychoeducational Studies (1) Data analyses, collection, and interpretation. May be repeated. Maximum 9 hrs. S/NC only. F, Sp

656 Scale Construction (3) Development, piloting, and refinement of inventories, rating scales, and other paper-and-pencil techniques for assessing beliefs, personality characteristics, and opinions. Prereq: Counselor Education and Counseling Psychology 535, and two-course sequence in statistical analysis. F

657 Analysis of Research in Instructional Technology (3) Research on human learning, design of learning environments. Analysis of teaching behavior, text, development, computer software design and video presentations. A

668 Practicum in Instructional Planning (3) Development and management of course or program of in-service educational psychology. Prereq: 665, or consent of instructor. F

669 Internship in Educational Psychology (1-6) Supervised employment in units approved in collaborative psychology internship sites. May be repeated. Maximum 12 hrs. S/NC only. E

671 Mediated Learning Theory (3) Feuerstein's theory of mediated learning experience and its connections to work of Piaget, Vygotsky and others. Implications for transformational learning and building learning communities for learners of all ages. Prereq: Admission to doctoral program or consent of instructor. F

673 Collaborative Learning (3) Team taught, interactive course on collaborative learning theory related to professional practice. Integration of mediated learning theory with reflective practice related to furthering of collaborative learning in professional practice settings. Engagement of class members in collaborative learning. Prereq: 513 and 671 or consent of instructor. Sp

690 Psychopathology of Childhood (3) Descriptive and critical study of psychopathology of childhood and of systems of nomenclature applied to individuals with mental disorders: nomenclature provided by State Department of Education's Student Evaluation Manual and Diagnostic and Statistical Manual of Mental Disorders of American Psychiatric Association. F

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

Electrical and Computer Engineering

DEGREES

Major

Electrical Engineering

(Ph.D.)

M.S., Ph.D.

Mohammad A. Karim, Head

Professors:

Abidi, Mongi A., Ph.D. .................. Tennessee

Alexoff, Igor (Emeritus), Ph.D., F.A. ........ Wisconsin

Bailey, J. Milton (Emeritus), Ph.D. ........ Georgia Tech

Birdwell, J. Douglas, Ph.D. ................ MfT

Bishop, A. (Emeritus), Ph.D. ...... Clemson

Blalock, T. Vaughan (Emeritus), Ph.D. .......... Tennessee

Bodheimer, Robert E. (Emeritus), Ph.D. ........ Northwestern

Boe, Bimal K. (Condra Chair of Excellence), Ph.D. .......... Calcutta

Bouldin, Donald W., Ph.D. .......... Vanderbilt

Gonzalez, R. C. (Emeritus), Ph.D. .......... Florida

Googe, Joseph M. (Emeritus), Ph.D. .......... Georgia Tech

Green, Walter L. (Emeritus), Ph.D. .......... Texas A & M

Hung, James C. (Emeritus), Ph.D. .......... New York

Karim, Mohammad A. (Liaison), Ph.D. .......... Alabama

Kennedy, Eldredge J. (Emeritus), Ph.D. .......... PE

Lawler, J. S., Ph.D. .......... Michigan State

Neff, Herbert P. (Emeritus), Ph.D. .......... Penn State

Pace, Marshall O., Ph.D. .......... Georgia Tech

Pierce, J. Frank (Emeritus), Ph.D. .......... PE

Pujol, Alfonso Jr. (UTSI), Ph.D. .......... Vanderbilt

Roberts, M., J., Ph.D. .......... Tennessee

Rochelle, Robert W. (Emeritus), Ph.D. .......... Mary And

Roth, J. Reece, Ph.D. .......... Cornell

Symonds, Frederick W. (Emeritus), Ph.D. .......... PE

Tillman, James D. (Emeritus), Ph.D. .......... Nottingham

Associate Professors:

Bomer, Bruce W. (UTSI), Ph.D. .......... Tennessee

Crill, Paul B., Ph.D. .......... New Mexico State

Islam, Syed, Ph.D. .......... Connecticut

Joseph, Roy D. (UTSI), Ph.D. .......... Missouri (Rolla)

Koch, Daniel, Ph.D. .......... Missouri (Rolla)

Lawniczak, Henry, Ph.D. .......... Tennessee

Pace, Marshall O., Ph.D. .......... Georgia Tech

Putnam, Denny, Ph.D. .......... Tennessee

Rochelle, James M., Ph.D. .......... Tennessee

Walker, Alvernon, Ph.D. .......... NC State

Assistant Professors:

Bradley, Arthur, PE, Ph.D. .......... Auburn

Chiasson, John, Ph.D. .......... Minnesota

Montoya, Tom P., Ph.D. .......... Georgia Tech

Qi, Hai Rong, Ph.D. .......... NC State

Smith, L. Montgomery (UTSI), Ph.D. .......... PE

Smith, Philip W. ........... Virginia

Tolbert, Leon, Ph.D. .......... Georgia Tech

Whitaker, Ross T., Ph.D. .......... North Carolina
The Department of Electrical and Computer Engineering offers graduate degrees leading to the Master of Science and a Doctor of Philosophy in Electrical Engineering. Graduate students are able to conduct research in a wide variety of electrical engineering areas including communication, computer engineering, computer vision and robotics, electromagnetics, sensors with the Oak Ridge National Laboratory, Instrumentation and Controls Division. This program provides students with unique opportunities to pursue career-related training at ORNL while satisfying the requirements of ORNL. Some of the electrical engineering courses are offered in the evening. Engineering students working industry are encouraged to participate in the department's graduate program. Further information about these programs is available from the department.

The Departmental Graduate Committee is responsible for administering, promoting, and advancing the general well-being of the graduate program. Departmental actions regarding a graduate student may be appealed in writing, first to the departmental graduate committee and then to the department faculty.

THE MASTER'S PROGRAM

Graduate work leading to the Master of Science with a major in Electrical Engineering may be completed during one academic year of full-time study, or two to three years of part-time study.

Admission Requirements

Applicants for admission to the M.S. degree program are expected to have completed a bachelor's degree in Electrical Engineering with an average of at least 3.0 out of 4.0 both overall and in the senior year. All applicants whose native language is not English, including those who have earned degrees at U.S. institutions, must score at least 550 on the TOEFL exam to be considered for admission to the program.

Students who hold the bachelor's degree in a field other than electrical engineering are also expected to have a minimum cumulative grade-point average of 3.0 and a minimum senior year average of 3.0 in that field. The department will require that selected undergraduate courses be taken to make the background of these students comparable to that of students who hold a bachelor's degree in Electrical Engineering. These undergraduate courses may include electrical engineering courses from the sophomore and junior years and one senior electrical engineering sequence of the student's choice. The specific set of undergraduate courses required will be chosen in view of the applicant's prior education and experience. The student will be admitted under non-degree status until the required undergraduate courses are successfully completed with a 3.0 average.

Master's Degree Requirements

Students may choose between a thesis option and a project (non-thesis) option M.S. program. All students must file a Master's Program Plan with the departmental graduate committee specifying which option they have selected, a semester-by-semester schedule of the courses they intend to take, and the members of the student's master's committee. Students may change between the thesis and project options, one time, by filing an amended Master's Program Plan.

Thesis Option: Specific requirements of the thesis option are a minimum of 30 semester hours including:

1. Electrical Engineering 503 and 504.
2. Six semester hours of mathematics at the 400 level or above selected from a list approved by the graduate committee, or 6 semester hours of EE courses at the 500 level or above, or 6 semester hours of non-EE courses approved by the student's master's committee and the graduate committee.
3. An additional 12 semester hours of 500-level work in electrical engineering including 6 semester hours in the student's major area of electrical engineering and 6 semester hours in a second area of electrical engineering approved by the student's master's committee.
5. A final oral examination covering the thesis and related coursework.

Non-Thesis Option: Specific requirements of the project (non-thesis) option are a minimum of 33 semester hours including:

1. Electrical Engineering 503 and 504.
2. Six semester hours of mathematics at the 400 level or above selected from a list approved by the graduate committee, or 6 semester hours of EE courses at the 500 level or above, or 6 semester hours of non-EE courses approved by the student's master's committee and the graduate committee.
3. An additional 18 semester hours of 500-level work in electrical engineering with at least 6 hours of 500-level work in each of two areas of electrical engineering.
4. Electrical Engineering 501 (project in lieu of thesis) with a minimum grade of B. This course will be administered by the student's master's committee. A written project proposal describing what the student will do in the course must be submitted in advance for the graduate committee's approval. A written final report and oral presentation is required and one copy of the final draft must be submitted to the graduate committee.
5. A final written and oral examination covering the project and related coursework.

THE DOCTORAL PROGRAM

The Ph.D. degree program with a major in Electrical Engineering may be pursued in the concentration areas of circuit theory, computers, electro-optics, communication theory, electromagnetic theory, plasma engineering, power systems, solid-state electronics, power electronics, and control systems.

Applicants are required to submit scores on the General Graduate Record Exam. A TOEFL score of 550 is required for non-native speakers of English, including those who have earned degrees at U.S. institutions. Specific departmental requirements for the Ph.D. include the following:

1. A Master of Science or Master of Engineering degree.
2. A minimum of 24 semester hours of coursework beyond the Master's, excluding research and dissertation credit. These hours must include:
   a. A minimum of 12 semester hours in electrical engineering at the 500 and 600 level.
   b. A minimum of 9 semester hours of 600-level coursework. At least 3 hours of this work must be in an area other than the student's major area.
   c. A minimum of 6 hours of mathematics courses at the 500 level or above and approved by the electrical engineering graduate committee.
3. One foreign language if the student's faculty committee feels that a reading knowledge of a foreign language is crucial to the student's research efforts.
4. Satisfactory performance on a qualifying examination and a comprehensive examination. The qualifying examination is prepared by the Electrical Engineering faculty and consists of two 4-hour written examinations covering courses required in the undergraduate electrical engineering curriculum through the junior level. The qualifying examination is offered twice each year (January and August) and is to be taken the first time it is offered after the student enrolls in the program. A student who fails the qualifying examination must take and pass the examination the next time it is offered to remain in the program. A minimum of 16 hours of coursework must be completed after the student has taken the qualifying examination the first time.

A comprehensive examination is required by The Graduate School. In this department the comprehensive exam is administered by the student's committee; the exam results are reported to the graduate committee for approval; and the exam is filed in the department. The comprehensive exam is given when the student is ready to apply for admission to candidacy. The comprehensive exam consists of both written and oral parts. The written part consists of at least two sections: a complete review of the literature in the student's dissertation topic, and a review of the major tools to be used in the dissertation work. The student's committee may require additional sections. The students must demonstrate a mastery of the dissertation area, ability to think analytically and creatively, skill in using academic resources, and ability to complete the dissertation satisfactorily. The oral part consists primarily of a professional presenta-
Note: Courses required in the Electrical Engineering undergraduate curriculum cannot be used in either the M.S. or Ph.D. programs. No 400-level course may be count toward a graduate degree in Electrical Engineering except when required by the program.

400 Senior Design (5) Major design project focusing student's attention on professional practice, accumulation of knowledge related to a specific area of expertise, completion of design project. Level 1 design projects which require laboratory work. Prereq: Linear System Analysis, Electrical Energy Systems Components, Electronic Circuits, Analog Communication Amplitude and Frequency Modulation, Introduction to Logic Design of Digital Systems.

411 Digital Signal Processing and Filter Design (3) Discrete-time signals and systems, sampling, discrete Fourier transforms, analog filter characteristics, non-recursive and recursive filter design, and CAD tools for filter design. Level 1 design projects which require laboratory work. Prereq: Frequency-Domain Analysis of Signals and Noise, Linear System Analysis, Systems and Power Laboratory.

412 Linear Control System Design (4) Classical and modern techniques for design and compensation of linear feedback control systems. Bode plot, root locus design, state variable pole placement design. Level 2 design projects which require laboratory work. Prereq: 411.


431 Operational Amplifier Circuits (3) Linear and non-linear active circuits in commercial operational amplifiers, operational amplifier circuits, feedback circuit analysis, and automatic generation control. Voit-var control, load management, cogeneration and other topics of contemporary concern. Level 2 design projects. Prereq: 421.


443 Antennas and Propagation (3) Antenna theory: fundamental antenna concepts and parameters (directivity, gain, patterns, etc.) and signal propagation. Theory and design of antennas, arrays, and other simple antennas. Level 1 design projects. Prereq: 441.

451 Microprocessors and Microcontrollers in Electrical Engineering Applications. Basic microcomputer architecture, computer assembly programming, and microcontroller applications. Grade dependent upon number of projects completed, homework projects, and design entity. Level 2 design projects which require laboratory work. Prereq: 451.

452 Organization and Design of Digital Systems and Computers (4) Considerations for hardware organization and design in computer and digital systems: ALU and CPU structures, organization of storage system and I/O devices, microprogramming control unit and other interrupt structures. Level 2 design projects which require laboratory work. Prereq: 451.


481 Power Electronics (3) Principles and characteristics of power semiconductor devices, single-phase and polyphase phase-controlled converters, converter control, ac phase controller, voltage-fed inverter and dc-dc converter principles, and industry applications. Level 1 design projects which require laboratory work. Prereq: Frequency-Domain Analysis of Signals and Noise, Transient Analysis, Electric Energy System Components, Electronic Circuits, Systems and Power Laboratory.

482 Power Electronics Circuits (4) Voltage-fed inverters, PWM principles, control of inverters, dc-dc converters, motor drives, resonance converters, step motor drives, brushless dc machine principles. Level 2 design projects which require laboratory work. Prereq: 481.

491 Control Systems Design II (3) Digital control, variable structure control, and robust controller design. SISO systems, use of estimators and observers, construction of classical and modern control systems. Prereq: 491-2 or 491-9.

495 Control Systems Seminar (3) Design and analysis of control systems and signal processing problems in matrix-vector form with applications to large scale power systems. Prereq: 491 or equivalent.

501 Project in Lieu of Thesis (3) Capstone course under supervision of student's major professor and committee. Individual project involving literature survey, development of test equipment, and analysis of one software or hardware problem, testing a white box or black box, or an alternate product. Completion of all junior EE courses or consent of instructor. Prereq: Consent of graduate committee. May be repeated. Maximum 6 hrs.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E.


504 Random Process Theory for Engineers (3) Probability and random variables as approached by set theory. Statistical averages and transformations of random variables. Random processes, stationarity, correlation functions and temporal analysis, power spectrum and spectral analysis as applied to response of systems to random signals.

505 Digital Signal Processing I (3) Discrete-time signals and systems, digital convolution, finite impulse response (FIR) and infinite impulse response (IIR) filters.

506 Digital Signal Processing II (3) Filter properties in the Z and Fourier transform domains, structures for digital filters, sampling and reconstruction, hardware implementation of digital filters.

507 Application of Linear Algebra in Engineering Systems (3) (Same as Chemical Engineering 507 and Mechanical Engineering 507).

511 Linear Systems Theory (3) State space models of continuous and discrete systems. State transition matrix, mapping, controllability, and observability, realization theory, and stability theory. Coreq: 507.

512 Multivariable Linear Control System Design (3) Design of controllers, for multivariable systems which satisfy constraints on robustness to plant uncertainties, disturbance rejection, command following. Prereq: 511.


521 Power Systems Analysis I (3) Matrix-vector representations of power networks, sequence modeling of power system components, unbalanced short and series faults. Formulating and solving problems in matrix-vector form with application to large scale power systems. Prereq: 421 or equivalent.

522 Power Systems Analysis II (3) Operation and control of interconnected power systems, transient and dynamic stability. Formulating and solving problems in matrix-vector form with application to large scale power systems. Prereq: 521.

523 Power Electronics and Drives (3) Forced commutation, gate-turn-off (GTO) devices, PWM techniques, current-fed inverters, drive system modeling, vector and scalar control of induction machines, parameter variation control, principles of synchronous machines.


531 Advanced Analog Electronics I (3) Physical operation of modern electronic devices, semiconduc- tor devices: diodes, transistors,BJTs, FETs, MOS-FETs. Small-signal equivalent circuits and noise models of active devices. Project laboratory. Prereq: 541, 532, or consent of instructor.

532 Advanced Analog Electronics I (3) Design and analysis of linear wideband low-noise feedback amplifiers.
Electromagnetic Fields (3) Maxwell's equations, special relativity, interactions and transmission, general media, guided waves, radiation from current elements. Prereq: Mathematics 404.


545 Introductory Microwave Networks and Components (3) Scattering and transfer representation for multipole, unilateral and bilateral microwave and millimeter wave devices. Component and system parameter measurement by modern network analyzers. Electronic oscillators and amplifiers; frequency sweeping oscillators, time delay circuits, parametric amplifiers, mixers, switches.


552 Digital System Design II (3) State identification and structure realizations of sequential machines. Digital system architecture design; microprogramming and interrupt control. Prereq: 551.

561 Plasma Diagnostics I (3) Principles of active, passive, perturbing and nonperturbing diagnostic methods used in low temperature plasmas, and high temperature plasmas of interest in fusion research. Laboratory safety, data collection and presentation, microprocessor based data handling and analysis, and reduction of time-series data. Prereq: 461, 465, or consent of instructor.

562 Plasma Diagnostics II (3) Laboratory instruction in operation of plasma diagnostic instruments in plasma science laboratory, experience with high voltage, vacuum, RF, and digital data handling techniques. Prereq: 561.

565 Industrial Plasma Engineering I (3) Low temperature plasma physics relevant to industrial applications; kinetic theory, particle dynamics in electric and magnetic fields, gaseous discharges, and electronic, ion, and plasma sources. Prereq: Graduate standing or consent of instructor.

566 Industrial Plasma Engineering II (3) Continuation of 565 to industrial applications; ion implantation in solids, plasma deposition and etching, space propulsion systems, plasma chemistry, plasma lighting devices, insulating dielectrics and breakdown, materials processing with plasma arcs, and related topics. Prereq: 565 or consent of instructor.

571 Pattern Recognition (3) Decision-theoretic and structural approaches to pattern recognition. Deterministic and statistical decision rules, feature extraction and representation, syntactic and semantic methods. Prereq: 471 or consent of instructor.

572 Digital Image Processing (3) Spatial and transform processing of images, neighborhood operators, image enhancement, restoration, and coding: Segmentation techniques. Image representation and description. Prereq: 472 or consent of instructor.

573 3D Methods in Robotic Sensing, Vision and Visualization (3) Tools used in image synthesis and analysis; 3D recovery by nonlinear estimation. Projective geometry, analytic photogrammetry, range sensing, lighting models, differential geometry, and 3D rendering.

574 Advanced Computer Vision (3) Principles and methods for analysis of time and space varying imagery. Imaging physics and color theory. Shape form and texture, feature correspondence and tracking, stereo vision, structure from motion, optical flow, motivated segmentation, and selected topics from recent literature. Prereq: 573 or consent of instructor.


588 Graduate Seminar (1) Topics of interest discussed in weekly seminar. May be repeated. Maximum 6 hrs. S/NC or letter grade.

599 Special Topics (1-3) May be repeated. Maximum 9 hrs.

600 Doctoral Research and Dissertation (3-15) P/NC only. E 600.

672 Image Processing and Robotics I (3) Three-dimensional scene modeling and recognition, multi-sensor systems. Prereq: 502 or 573 or consent of instructor.

673 Image Processing and Robotics II (3) Stereovision, shape theory. Prereq: 672.

681 Quantum Electronics II (3) Quantum mechanics in modern discrete, semiconductor theories, and advanced design methods. Prereq: 503 or consent of instructor.

682 Special Topics in Systems Theory II (3) Topics of interest to students and faculty: large scale systems, model order reduction, algebraic and geometric system theories, and advanced design methods. Prereq: 617.

623 Advanced Power Electronics and Drives (3) Phase-controlled cycloconverters, cycloconverter-fed ac drives, resonant converters, vector and scalar control of synchronous machines, static Kramer drives, static power devices, VSOC generalization, modern control theory in ac drives.

624 Electrical Insulation (3) Principles, testing, and case studies. Basic principles of aging, losses, charging, conduction, and breakdown in vacuum, gas, liquid, solid, and composite insulation systems. Testing with low-noise instrumentation, pulse height analysis, optics, acoustics, and bridges; associated statistics and distribution parameter effects. Case studies drawn from recent literature. Insulation of electronic circuits and devices, shielding, and stress grading. Prereq: 503, 504, and consent of instructor.

631 Advanced Topics in Electronic Instrumentation I (3) (Based on particular interests of students.) Fundamental physical processes in instrumentation transducers; thermoelectric, magnetoelectric, electromechanical and quantum-mechanical devices. Prereq: 531-32 and consent of instructor.


643 Detection and Estimation Theory (3) Detection theory; coding theory; system identification. Signal with unknown parameters; optimal filter synthesis; adaptive systems; sequential detection, suboptimal detection. Prereq: 504 or consent of instructor.

644 Coding and Information Theory (3) Structure of algebraic and probabilistic codes; linear codes, convolutional codes, turbo codes; decoding methods; identification schemes: deterministic, stochastic, and hierarchical methods. Prereq: 643.

651 Computer-Aided Design of VLSI Systems I (3) Fabrication of microelectronic devices; computer-aided design; algorithmic state machines; partitioning; structured design methodology. Prereq: 551-2 or consent of instructor.

652 Computer-Aided Design of VLSI Systems II (3) Computer-aided design tools; design and implementation of full custom very large scale integrated (VLSI) circuits; design for testability; testing of fabricated chips. Prereq: 651.

663 Advanced Plasma Physics I (3) Basic concepts of high temperature plasma physics. Magneto-hydrodynamic and kinetic descriptions of plasma, plasma transport, plasma waves, equilibrium, and stability. Prereq: Physics 541-2, 461-2 or 563-4, or consent of instructor. (Same as Physics 563.)

664 Advanced Plasma Physics II (3) Plasma heating and radiation phenomena. Advanced topics of current interest. Must be taken in sequence. Prereq: 663.

801 Advanced Graduate Seminar (1) Research in department. May be repeated. S/NC or letter grade.

802 Special Topics (1-3) Advanced topics of current interest to Ph.D. students in Electrical Engineering. May be repeated. Maximum 9 hrs.

### Engineering Science

**See Mechanical and Aerospace Engineering and Engineering Science**

### English (College of Arts and Sciences)

**MAJOR DEGREES**

**English** .................................................. M.A., Ph.D.

D. Allen Carroll, Head

Professors:

THE MASTER'S PROGRAM

Requirements

Coursework: A minimum of 24 semester hours in English beyond the B.A., to include 6 hours at the 600 level; 12 additional hours at the 500-600 level (Only 3 hours of 593 hour). By the end of their first year, students must take at least 9 hours in writing and 9 in literature, the remaining 6 to be selected from any English courses at the 600 level. Of the 6 courses in writing, 3 must be at the 500 level; additional 500-level courses are strongly recommended.

Writing Projects: One of the following writing projects for six hours of credit:

- A thesis, using research to analyze some aspect of writing or rhetorical theory.
- A creative project, such as a collection of poems or stories, a short novel, a play, or a creative work of non-fiction prose.

The nature and length of each project will be determined by the Director of Graduate Studies after consulting with the student and the project director. In addition to the director, two other English Department faculty members will supervise and approve the project; at least one should be from the literature faculty.

Final Examination: The reading list may be modified by the M.A. examining committee, meeting as a body with the student, to reflect the candidate's particular writing emphasis. However, most of the oral examination should focus upon the literature outlined in the original reading list.

THE DOCTORAL PROGRAM

Requirements

A student must successfully complete a program of study, normally 6 full semesters as outlined below, approved by the candidate's committee or the Director of Graduate Studies in English.

Coursework: At least 54 semester hours beyond the B.A. (of which at least 24 semester hours must be beyond the M.A.) to include at least 21 semester hours at the 600 level; at least 15 semester hours at the 500 level, or above, and 3 after the M.A.; a 3-hour course in independent study may be applied toward the M.A.: and 6 hours for graduate credit at any level, including the 400 level. In this coursework, students must maintain at least a 3.0 GPA.

Thesis Option: Written under the direction of a faculty member of the department and approved by a committee of two other faculty members. Six semester hours of credit will be given.

Non-Thesis Option: Six hours of additional courses at the 500-600 level, making a total of 30 hours of required coursework.

Language Requirement: Evidence of proficiency in one foreign language, to be fulfilled in one of the following ways:

1. Completion of the second year of a language at college level with a grade of C or better.
2. Completion of French 302 or German 332 at UT with a grade of B or better.
3. Passing of the regular Ph.D. foreign language examination as currently administered at UT.

Capstone Experience Requirement: An integral part of all options in the master's degree program in English is a capstone experience which allows the student to synthesize and apply the knowledge and skills gained through the completion of the program in a substantial way. Examples of capstone experiences include, but are not limited to, the completion of a thesis or the formal public presentation of a paper at a professional meeting or departmental colloquium. A capstone experience normally occurs after the completion of 24 hours of coursework and must be approved by the Director of Graduate Studies.

Final Examination: A candidate presenting a thesis must pass a one-hour oral examination; a candidate presenting a creative project must pass a ninety-minute oral examination. The examination consists of a short thesis defense, but chiefly of questions covering the general history of English and American literature. However, most of the oral examination should focus upon the literature outlined in the original reading list.

Writing Projects: One of the following writing projects for six hours of credit:

1. A thesis, using research to analyze some aspect of writing or rhetorical theory.
2. A creative project, such as a collection of poems or stories, a short novel, a play, or a creative work of non-fiction prose.

The nature and length of each project will be determined by the Director of Graduate Studies after consulting with the student and the project director. In addition to the director, two other English Department faculty members will supervise and approve the project; at least one should be from the literature faculty.

Final Examination: The reading list may be modified by the M.A. examining committee, meeting as a body with the student, to reflect the candidate's particular writing emphasis. However, most of the oral examination should focus upon the literature outlined in the original reading list.

THE DOCTORAL PROGRAM

Requirements

A student must successfully complete a program of study, normally 6 full semesters as outlined below, approved by the candidate's committee or the Director of Graduate Studies in English.

Coursework: At least 54 semester hours beyond the B.A. (of which at least 24 semester hours must be beyond the M.A.) to include at least 21 semester hours at the 600 level; at least 15 semester hours at the 500 level, or above, and 3 after the M.A.; a 3-hour course in independent study may be applied toward the M.A.: and 6 hours for graduate credit at any level, including the 400 level. In this coursework, students must maintain at least a 3.0 GPA.

Thesis Option: Written under the direction of a faculty member of the department and approved by a committee of two other faculty members. Six semester hours of credit will be given.

Non-Thesis Option: Six hours of additional courses at the 500-600 level, making a total of 30 hours of required coursework.

Language Requirement: Evidence of proficiency in one foreign language, to be fulfilled in one of the following ways:

1. Completion of the second year of a language at college level with a grade of C or better.
2. Completion of French 302 or German 332 at UT with a grade of B or better.
3. Passing of the regular Ph.D. foreign language examination as currently administered at UT.

Capstone Experience Requirement: An integral part of all options in the master's degree program in English is a capstone experience which allows the student to synthesize and apply the knowledge and skills gained through the completion of the program in a substantial way. Examples of capstone experiences include, but are not limited to, the completion of a thesis or the formal public presentation of a paper at a professional meeting or departmental colloquium. A capstone experience normally occurs after the completion of 24 hours of coursework and must be approved by the Director of Graduate Studies.

Final Examination: A candidate presenting a thesis must pass a one-hour oral examination; a candidate presenting a creative project must pass a ninety-minute oral examination. The examination consists of a short thesis defense, but chiefly of questions covering the general history of English and American literature, not merely the coursework taken. A reading list of primary works designed to help the student prepare for these examinations is approved by the office of the Director of Graduate Studies in English.

A non-thesis student must pass a written examination, followed by a one-hour oral examination, both consisting of the same sort of questions as the examination taken by the thesis student.

Residence Requirement: There is no residence requirement for the M.A., but students should attempt to pursue a full-time program whenever possible.

WRITING CONCENTRATION

The master's program with writing concentration is intended for those students who wish to develop their writing skills with a concentration in teaching writing courses at the college level, or as a professional writer in business or industry.

Requirements

The requirements for the writing concentration are the same as those for the thesis option above with the following exceptions:

Coursework: Writing students may substitute two 400-level writing courses for two 500-level courses. Students must take at least 9 hours in writing and 9 in literature, the remaining 6 to be selected from any English courses at the 600 level. Of the 6 courses in writing, 3 must be at the 500 level; additional 500-level courses are strongly recommended.

Writing Projects: One of the following writing projects for six hours of credit:

1. A thesis, using research to analyze some aspect of writing or rhetorical theory.
2. A creative project, such as a collection of poems or stories, a short novel, a play, or a creative work of non-fiction prose.

The nature and length of each project will be determined by the Director of Graduate Studies after consulting with the student and the project director. In addition to the director, two other English Department faculty members will supervise and approve the project; at least one should be from the literature faculty.

Final Examination: The reading list may be modified by the M.A. examining committee, meeting as a body with the student, to reflect the candidate's particular writing emphasis. However, most of the oral examination should focus upon the literature outlined in the original reading list.
foreign language examination as currently administered at UT.

2. One modern language approved by the Director of Graduate Studies in English. This requirement must be fulfilled by a passing grade on the language examination given by UT and completion of two courses given in the foreign language at the 400 level or above, at least one course to be at the 500 or 600 level. A minimum grade of B must be received in each course.

3. One modern language approved by the Director of Graduate Studies in English and intensive study of the English language. This requirement must be fulfilled by completion of (a), (b), or (c) in option 1. for one foreign language; and completion of 6 semester hours in English language courses with grades of B or better, at least three of which must be from English 508 or 509 History of the English Language (offered in alternate years only). For the other 3 hours, the student may either complete the history of the language sequence or choose one other course in language taught in the Department of English at the 500 or 600 level and approved by the Director of Graduate Studies in English. These courses will not count toward the minimum number of courses for the Ph.D., and anyone electing this language option may not take the comprehensive examination in linguistics.

Examinations: (1) A 4-hour qualifying examination taken before the end of the first year of Ph.D. coursework; this examination is given three times a year, with the M.A. written examination. (2) A comprehensive written examination which may be divided as the department directs; see the English Department graduate brochure. The comprehensive examination is given twice a year, normally in March and September. Before a student may take it, he/she must have completed all coursework required. A student must also have met all requirements for foreign languages before beginning the first part of the examination.

Dissertation Defense: A one-hour examination on the dissertation and other related areas.

Residence Requirement: Two consecutive semesters as a full-time student. For students not on teaching assistantships, full-time consists of 9 or more hours of coursework and/or dissertation hours each semester. For students on assistantships, full-time consists of at least 6 hours of courses and/or dissertation hours and 3 hours of teaching each semester.

GRADUATE COURSES

Note: Students enrolling in English graduate courses must first register in the office of the Director of Graduate Studies in 306 McClung Tower.

401 Medieval Literature (3) Reading and analysis of selected medieval literary masterpieces in modern English.

402 Chaucer (3) Reading and analysis of Canterbury Tales and Troilus and Criseyde in Middle English.

404 Shakespeare I: Early Plays (3) Shakespeare's dramatic achievement before 1601. Reading and discussion of selected comedies including Twelfth Night, English histories, including Henry IV; and early tragedy, including Hamlet.

405 Shakespeare II: Later Plays (3) Shakespeare's dramatic achievement between 1601 and 1612. Reading and discussion of selected plays from great tragedies, including Othello; problem plays, including Measure for Measure; and dramatic romances, including The Tempest.

406 Renaissance Drama (3) English theatre between 1550 and 1640 through reading of representative plays by Shakespeare's contemporaries: Marlowe, Webster, Jonson.

409 Spenser and his Contemporaries (3) Principal achievements in prose and poetry of sixteenth century authors; Spenser, Wyatt, Marlowe, More, Sidney, and Bacon.

410 Milton, Donne and their Contemporaries (3) Principal achievements in prose and poetry of first two-thirds of seventeenth century; poetry of Milton, Donne, Marvell, and prose of Browne, Bacon, Walton.

411 Literature of Restoration and Early Eighteenth Century: Dryden to Pope (3) Survey of English literature and culture from 1660 to 1745.

412 Literature of Later Eighteenth Century: Johnson to Burns (3) Survey of English literature and culture from 1745 to 1800.

413 Restoration and Eighteenth-Century Genres and Modes (3) A major genre or literary mode; fiction, poetry, non-fiction prose, satire, romance, or epic, written between 1660 and 1800. May be repeated.

414 Romantic Poetry and Prose I (3) Wordsworth, Coleridge, and Blake; readings from Lamb, De Quincey, and other prose writers.

415 Romantic Poetry and Prose II (3) Keats, Shelley and Byron; readings from Hazlitt, Peacock, and other prose writers.

416 Early Victorian Literature (3) May include poetry by Tennyson and the Browning; prose by Carlyle, Newman, and Mill.

419 Later Victorian Literature (3) May include poetry by the Pre-Raphaelites, Arnold, Hopkins, and Hardy; prose by Arnold, Ruskin, and Carroll; plays by Gilbert and Wilde.

420 The Nineteenth-Century British Novel (3) Scott to Hardy.

421 Modern British Novel (3) Works from authors such as Joyce and Woolf through contemporary British fiction writers.

422 Women Writers in Britain (3) Literary consciousness and works of women writers in Britain. Topics vary: Marie de France, Margery Kempe, Aemilia Lanyer, Elizabeth Cary, Anitra Behn, Frances Drake, Mary Wollstonecraft, Mary Shelley, George Elliot, Virginia Woolf, and Doris Lessing. May be repeated. Maximum 6 hrs. (Same as Women's Studies 422.)

431 Colonial, Federal, and Early National American Literature (3) From Columbus to Washington Irving.

432 American Romanticism and Transcendentalism (3) Prose and poetry of American Renaissance, from c. 1830 to the end of the Civil War: Cooper, Poe, Hawthorne, Melville, Emerson, Thoreau, Douglass, Whitman, and Dickinson.

433 American Realism and Naturalism (3) Literature and analysis of American Realism, from 1870 to the end of the Civil War: Twain, Howells, James, Jewett, Freeman, Crane, and Norris.

434 Modern American Literature (3) World War I to present.

435 American Novel before 1900 (3) From earliest sententious novels through Brown and Cooper, and major figures to 1900: Hawthorne, Melville, Stowe, Clemens, and James.


441 Southern Literature (3) Southern writing from colonial period into twentieth century: frontier humorists, local color writers, and Southern literary renaissance.

442 American Humor (3) Early nineteenth century through twenties: Mark Twain.

443 Topics in Black Literature (3) Contents vary: particular genres, authors, or theories from 1845 to present: Langston Hughes and Harlem Renaissance, Richard Wright and Gwendolyn Brooks, writing by Black women, international Black literature in English, and Black American autobiography.

451 Modern British and American Poetry (3) From Yeats and Frost to Auden, Stevens, and more recent poets.

452 Modern Drama, 1860-1945 (3) Survey of British, American, and international drama from the advent of modern dramas to the end of World War II.

453 Contemporary Drama (3) Survey of British, American, and international drama since World War II.

454 Twentieth-Century International Novel (3) Fiction in English translation from 1900 to the present. Includes as Kafka and Camus through contemporary authors.

455 Persuasive Writing (3) Writing and analyzing persuasive texts in public, private, and academic contexts. Prereq: Advanced Expository Writing or consent of instructor.

456 Contemporary/Postmodern Literature (3) Studies in literature written after World War II. Content will vary. May be repeated with consent of instructor. Maximum 6 hrs.

460 Technical Editing (3) Editing technical material for publication. Principles of style, format, graphics, layout, and introduction management. Prereq: Technical and Professional Writing or consent of instructor.

462 Writing for Publication (3) Principles and practices of writing for publication. Dissertation, theses, articles, and reports in science and technology. Prereq: Technical and Professional Writing or consent of instructor.

463 Advanced Poetry Writing (3) Further development of skills acquired in basic writing poetry course. Prereq: 365 or consent of instructor.

464 Advanced Fiction Writing (3) Further development of skills acquired in basic fiction course. Prereq: 365 or consent of instructor.

466 Writing, Layout, and Production of Technical Documents (3) Principles of design for desktop publishing. Production of various documents to be incorporated into professional portfolio. Prereq: Technical and Professional Writing or consent of instructor.

470 Special Topics in Rhetoric (3) Topics vary. Prereq: Advanced Expository Writing or consent of instructor. May be repeated with consent of departmental permission. Maximum 6 hrs.

471 Sociolinguistics (3) Study of language in relation to society. Empirical and theoretical focus. Large-scale units: tribes, nations, social groups. Prereq: 371 or 372 or Linguistics 200 or consent of instructor. (Same as Linguistics 471.)

472 American English (3) Phonological, morphological, and syntactic characteristics of major social and regional varieties of American English: origins, functions, and implications for cultural pluralism. Prereq: 371 or 372 or Linguistics 200 or consent of instructor. (Same as Linguistics 472.)

474 Teaching English as a Second or Foreign Language I (3) Issues surrounding teaching ESL/EFL. Pedagogical implications of language acquisition; introduction to second language acquisition, learner variables; sociolinguistics in language learning; traditional and innovative approaches to ESL/EFL. Prereq: Second year of foreign language or consent of instructor. (Same as Linguistics 474.)

475 Teaching English as a Second or Foreign Language II (3) Issues, principles, and techniques in teaching ESL/EFL, pedagogical implications of language acquisition; introduction to second language acquisition, learner variables; sociolinguistics in language learning; traditional and innovative approaches to ESL/EFL. Prereq: Second year of foreign language or consent of instructor. (Same as Linguistics 475.)

476 Second Language Acquisition (3) How humans learn second languages. Theoretical models and research: differences between first and second language acquisition; learner variables; sociocultural factors; and implications for second/foreign language instruction. (Same as Linguistics 476.)
GRADUATE COURSES

410 Diseases and Insects of Ornamental Plants (3) Symptoms, identification and management of diseases and insect pests that affect plants in greenhouses, turfgrass, and landscape design environments. Prereq: Plant Pathology or Economic Entomology or consent of instructor. Sp, A

502 Registration for Use of Facilities (1-5) Required for the student not otherwise registered during any semester when they use University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E

510 Plant Disease Fungi (4) Morphology, taxonomy, biology, and genetics of plant pathogenic fungi; isolation and identification of plant pathogenic fungi. Prereq: 313 or consent of instructor. 2 hrs and 2 labs. (Same as Ornamental Horticulture and Landscape Design 511.) F, A

512 Soilborne Plant Pathogens (3) Causal agents; soil-plant-soil environment interactions; epidemiology; and biological, cultural, and chemical control. Prereq: Plant Pathology or consent of instructor. F, A

541 Bacterial Plant Diseases (4) Morphology, taxonomy, ecology, physiology, and genetics of bacterial plant pathogens; infection and disease development, pathogenesis and resistance; diagnosis, detection, effect of environment, and management of bacterial plant diseases; beneficial plant-bacterial interactions. Prereq: Plant Pathology or consent of instructor. 3 hrs and 1 lab. Sp, A

515 Physiology of Plant Disease (3) Biochemical and physiological events involved in host-pathogen interactions. Mechanisms of disease resistance. Prereq: Introductory plant pathology and physiology, or consent of instructor. F, A

520 Plant Parasitic Nematodes (4) Morphology, taxonomy, ecology, and management of plant parasitic nematodes; host-parasite relationships. Prereq: 6 hrs biological science or consent of instructor. 2 hrs and 2 labs. Sp, A

521 Plant Virology (3) Symptomatology, epidemiology, and control of plant viruses. Prereq: 313 or consent of instructor. 2 hrs and 1 lab. Sp, A

522 Field Crop and Vegetable Insects (2) Identification, biology, and management of insect pests affecting crop and vegetable production. Prereq: 321 or basic entomology course. 1 hr and 1 lab. Sp, A

525 Medical and Veterinary Entomology (3) Morphology, taxonomy, biology and control of arthropod parasites and vectors of pathogens of humans and animals. Ecology and behavior of vectors in relation to vector transmission and control. Prereq: 321 or 325, or consent of instructor. 2 hrs and 1 lab. Sp, A

530 Integrated Pest Management (3) Principles and applications of biological, cultural, genetic, behavioral, and chemical methods of control to maintain pest populations below economic threshold levels. Prereq: 321, or consent of instructor. (Same as Plant Science 330.) F, A

531 Special Problems in Entomology (1-3) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs. E

532 Special Problems in Plant Pathology (1-4) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs. E

533 Concentrated Study in Entomology (1-3) Selected subjects in entomology for advanced students, concentrated in time and subject matter. Prereq: 321 or basic entomology course. May be repeated. Maximum 6 hrs. F, S, P

541 Seminar (1) Review of literature and current research in entomology and plant pathology. May be repeated. Maximum 2 hrs. E

Environmental Engineering
See Civil Engineering

Exercise Science and Sport Management

(Majors (College of Education)

MAJORS

CHEMISTRY

Exercise science (exercise physiology, biomechanics, sports medicine)

Doctor of Philosophy

Education

Exercise science

See Education Under Fields of Instruction for full description of all degree requirements.
Exercise Science and Sport Management

Exercise Science

GRADUATE COURSES

480 Physiology of Exercise (3) Functions of body in muscular work: physiological aspects of fatigue, training and adaptation to environment. Prereq: Biochemistry and Cellular and Molecular Biology 230 Human Physiology or 440. Grade B or higher. (Same as Biochemistry and Cellular and Molecular Biology 480.)

500 Thesis (1-15) P/NP only. E.

501 Special Project (3) Cummulative experience for non-thesis major. Research study suitable for publication, or practicum requiring special written work. S/NC only.

502 Registration for Use of Facilities (1) Requisition register during any semester when student uses University facilities and/or faculty time before degree is completed. May be repeated. S/NC only.

503 Problems in lieu of Thesis (1-3) May be repeated. Maximum 9 hrs. S/NC only.

508 Research in Exercise Science (3) Research for writing of thesis and institutional review board proposals: presentation of research through free communications and poster presentations; calculation and interpretation of statistics related to common research designs used in research; and use of computer software.

509 Graduate Seminar in Public Health (1) (Same as Public Health 509, Nursing 509 and Social Work 509.)


513 Biomechanics of Orthopedic Rehabilitation (3) Effect of physical activity on musculoskeletal tissue: flexibility, development and measurement, surgical implications, and rehabilitation related research.

516 Therapeutic Exercise (3) Current research in therapeutic exercise: role of nervous system, soft tissue healing, proprioception, muscle activation patterns, and strength.

521 Analytic Epidemiology (3) Epidemiologic strategies for evaluating research questions concerning causes, prevention and treatment of morbidity and disability. Presentations by experts working with large population-based datasets. Research proposals: grant writing and protocol preparation. Prereq: Course in statistics or consent of instructor.

525 Epidemiology of Injury and Violence (3) Epidemiologic methods to describe magnitude and examine etiology of unintentional and intentional injury. Alternative approaches for preventing or controlling occurrence of injury and violence in both general population and high risk sub-populations.

533 Exercise Physiology (3) Physiology of human performance; acute and chronic effects of exercise on metabolic, cardiac, pulmonary, and skeletal systems. Prereq: Human Physiology or general physiology, general chemistry, 2 hrs and 1 lab.

541 Special Topics (1-3) Advanced study in selected areas of exercise science. May be repeated.

563 Laboratory Techniques in Exercise Physiology (3) Laboratory course in methodology and instrumentation: respiratory and metabolic measurements, blood chemistry, and gas analysis. Prereq: 460 or 533.

565 Advanced Physiology of Exercise (3) Systematic study of skeletal muscle and metabolism related to acute exercise and physical training: lectures, discussions of major scientific reviews, and appropriate laboratory experiments. Prereq: 460 or 533.


569 Clinical Exercise Physiology (3) Cardiac structure and function, interpretation of 12-lead electrocardiograms, exercise considerations for cardiac and pulmonary patients. Prereq: 460 or 533. (Same as Physical Health 569.)

570 Cardiac Rehabilitation Practicum (1-3) Supervised experience in hospital-based exercise programs for participants with cardiac and pulmonary disorders. Use of telemetry monitoring, leading safe exercise regimen counseling participants on safe exercise guidelines. Presenting educational classes on topic applicable to hospital staff. Prereq: 533 and 567, or consent of instructor. Coreq: 560. May be repeated. Maximum 6 hrs.

585 Seminar in Gerontology (1) (Same as Human Ecology 585, Counseling Education and Counseling Psychology 585, Nursing 585, Physical Health 585, Educational Psychology 585, Social Work 585, and Sociology 585.)

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E.

600 Doctoral Research and Dissertation (1-3) Pr/ NP only. E.

601 Research Seminar in Exercise Science (1) Research topics in different facets of exercise science. May be repeated. S/NC only.

622 Directed Independent Research (1-6) Prereq: Doctoral student or consent of instructor. May be repeated. S/NC or letter grade.

625 Mortality and Survival (3) Life table and other population-based approaches to studying international and sociodemographic patterns and differentials in mortality, morbidity, and disability. Prereq: 2 graduate statistics courses or consent of instructor.

635 Physical Activity and Positive Health (3) Review of clinical, epidemiological, and experimental evidence concerning relationship and effects of exercise on health-related conditions of fitness. Prereq: Elementary statistics, 480 or 533 and consent of instructor. (Same as Public Health 635.)

661 Seminar in Exercise and Applied Physiology (1-3) Selected topics in exercise and environmental physiology. Prereq: 480 or 533. May be repeated with consent of instructor.

664 Research Participation in Applied Physiology (1-6) Participation in research with faculty member whose interests coincide with those of student. S/NC only.

668 Practicum (1-3) Intern experience in areas of major interest. May be repeated.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E.
Finance

(College of Business Administration)

MAJOR

Business Administration ............ MBA, Ph.D.

James W. Wansley, Head

Professors:
Black, Harold A. (James F. Smith, Jr., Prof.), Ph.D. .......... Ohio State
Boehm, T. P., Ph.D. .......... Washington (St. Louis)
DeGennaro, R. P. (TN Bankers Assoc. Scholar), Ph.D. .......... Ohio State
Dorfterreich, William W. (Emeritus), Ph.D. .......... Pennsylvania
Ehrhardt, M. C. (Voight Scholar), Ph.D. .......... Georgia Tech
Philippatos, G. C. (Distinguished Prof.), Ph.D. .......... New York
Shrieve, Ronald E. (SunTrust Bank Prof.), Ph.D. .......... UCLA
Wachowiak, J. M., Jr., CPA, Ph.D. .......... Illinois
Wansley, James, W. (Olayton Chair of Excellence) (Liaison), CFA, Ph.D. .......... South Carolina

Associate Professors:
Auxier, A. L., Ph.D. .......... Iowa
Collins, M. Cary, Ph.D. .......... Georgia
Daves, Phillip R., Ph.D. .......... North Carolina
Gunnthorpe, Deborah L., Ph.D. .......... Florida

BUSINESS ADMINISTRATION CONCENTRATIONS

For complete listing of MBA and Ph.D. program requirements, see Business Administration.

MBA Concentration: Finance.

The curriculum offers courses for those interested in corporate financial management, security analysis and investments, banking and financial institutions, and real estate. Minimum course requirements are three courses: Finance 510 (6 hours), plus two from the following: 512, 522, 532, 551, and 581.

Ph.D. Concentration: Finance.

Minimum course requirements are finance seminars 541, 642, 651, 582.

GRADUATE COURSES

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.


511 Administration/Supervision in Sport (3) Development of knowledge and analytic skills desirable for managers/administrators in sport business/organization: organizational, administrative, and supervisory strategies related to sport in profit and non-profit settings. F, Sp

512 Application of Legal Concepts to Sport Settings (3) Application of contract law, breach of contract, and monetary damages within sport settings: risk assessment and development of effective risk management strategies, development of contracts in sports; and analysis of cases involving discrimination based upon gender, race, and age as well as protection of rights at amateur and professional levels of sport. Sp

522 Portfolio Analysis and Management (3) Portfolio theory and evidence of behavior of security returns with views to determining rational investment policy. Topics may include: subperiods, market conditions, and historical returns. May be repeated. S/NC or lettergrade.

530 Problems in Financial Management (3) Readings and cases that apply finance theory to real-world investment, financing, and asset management problems. Prereq: Business Administration 504 and 505 or consent of instructor.

532 Commercial and Investment Banking (3) Analysis of loan granting policies of financial institutions and business banking firms. Legal, economic, and regulatory environment and implications for management. May be repeated. S/NC or lettergrade.

534 Business Administration (3) Integrated approach in investments, corporate finance, and institutions areas. Prereq: Business Administration 504 and 505 or consent of instructor.

551 Financial Management of a New Enterprise (3) Financial issues associated with formation, control, and long-term planning of new enterprise. Acquisition of venture capital. Prereq: Business Administration 504 and 505 or consent of instructor.

581 Real Estate Investment and Finance (3) Financial and market analysis used to make real estate investment decisions. Effects of varying financial assumptions and their impact on rea estate markets. Topics may include: subperiods, market conditions, and historical returns. May be repeated. S/NC or lettergrade.

592 Special Topics in Finance (1-3) Topics vary. Prereq: Consent of Instructor. May be repeated. Maximum 6 hrs. S/NC or lettergrade.

600 Doctoral Research and Dissertation (3-15) Prereq: Consent of Instructor. May be repeated. Maximum 6 hrs. S/NC or lettergrade.


651 Seminar in Corporate Finance (1-3) Recent theoretical and empirical developments in corporate finance. Topics may include: subperiods, market conditions, and historical returns. Prereq: Consent of Instructor. S/NC or lettergrade.

652 Seminar in Asset Pricing and Markets (1-3) Recent theoretical and empirical developments in finance. Topics may include: subperiods, market conditions, and historical returns. Prereq: Consent of Instructor. S/NC or lettergrade.

653 Seminar in Financial Institutions (1-3) Theoretical and empirical studies of financial institutions. Topics may include: subperiods, market conditions, and historical returns. Prereq: Consent of Instructor. S/NC or lettergrade.

654 Special Topics (1-3) Recent developments in finance. Topics may include: subperiods, market conditions, and historical returns. Prereq: Consent of Instructor. S/NC or lettergrade.
Food Science and Technology

(College of Agricultural Sciences and Natural Resources)

MAJOR DEGREES

Food Science and Technology .... M.S., Ph.D.

Clark J. Brekke, Head

Professors:

Brecke, C. J., Ph.D. ................. Wisconsin
Collins, J. L. (Emeritus), Ph.D. ....... Maryland
Davidson, P. M., Ph.D. ................. Washington State
Draughon, F. A., Ph.D. ................. Georgia
Jaynes, H. O. (Emeritus), Ph.D. ....... Illinois
Melton, C. C., Ph.D. ................. Kansas State
Melton, S. L., Ph.D. ................. Tennessee
Miles, J. T. (Emeritus), Ph.D. ....... Wisconsin
Morris, W. C., Ph.D. ................. Iowa State
Overcast, W. W. (Emeritus), Ph.D. .... Iowa State
Penfield, M. P., Ph.D. ................. Tennessee

Associate Professors:

Golden, D. A. (Liaison), Ph.D. ....... Georgia
Loveday, H. D., Ph.D. ................. Kansas State
Mount, J. R., Ph.D. ................. Ohio State

Assistant Professors:

Huibert, G., Ph.D. ................. Illinois
Kelly-Winterberg, Kimberly (Adjunct), Ph.D. ..... Utrecht
van Laack, R. L., Ph.D. ................. Pennsylvania
Weiss, J., Ph.D. ................. Massachusetts

The Department of Food Science and Technology offers the Master of Science and Doctor of Philosophy degrees. Students in the doctoral program may choose research in the concentration areas of food processing, food chemistry, food microbiology or sensory evaluation of foods. Commodity interests (meats, dairy, fruits, vegetables, bakery products) can be emphasized in any of the areas by careful selection of courses and the research topic. Minors are available in cognate fields. For detailed information, contact the department head.

Admission requirements of The Graduate School of UT apply. In addition, applicants must submit scores from the general section of the Graduate Record Exam (GRE), a written statement of educational and career goals, and Graduate School rating forms or letters of recommendation from at least three people familiar with the applicant's scholastic ability and professional potential. Admission to the program is contingent upon faculty evaluation of the applicant's undergraduate graduate GPA, GRE scores, rating forms, relevant work experience, and scores from the Test of English as a Foreign Language (TOEFL), if applicable.

THE MASTER'S PROGRAM

Applicants must have a B.S. in food technology, food science or a related scientific field.

Thesis Option

1. Prior to research for the thesis, the student must develop a detailed written research plan. Registration for 6 hours of 500 Thesis is required.
2. In addition to the thesis requirement, a minimum of 24 semester hours of graduate coursework is required. This work must be approved by the student's committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student's progress or background indicates such need.
3. All students are required to take 2 hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master's program. Completion of 510 or equivalent is also required.
4. An oral, final examination covering the thesis and coursework is required.

Non-Thesis Option

1. In lieu of a thesis, students are required to complete a problem in cooperation with their employer (company or governmental agency) and their faculty committee. Students working on a problem must register for 6 hours of 503.
2. In addition to the requirement for 6 hours of 503, a minimum of 24 semester hours of graduate coursework is required. This work must be approved by the student's committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student's progress or background indicates such need.
3. All students are required to take 2 hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master's program. Completion of 510 or equivalent is also required.
4. Students will be required to take a written comprehensive examination covering their coursework. In addition, an oral, final examination covering the problem and coursework is required. The oral examination will be held on the Knoxville campus.

THE DOCTORAL PROGRAM

1. Completion of a master's degree in the field, or a closely related field, or passing a special qualifying examination is required for admission.
3. A minimum of 72 hours beyond the Bachelor's degree, excluding credit for the master's thesis, is required. Of this, 24 semester hours must be 600 Doctoral Research and Dissertation.
4. At least 24 hours of coursework numbered above 500 are required exclusive of doctoral research and dissertation. At least 6 of the 24 hours must be courses numbered above 600.
5. A minimum of 6 hours of courses for graduate credit must be taken outside the Department of Food Science and Technology.
6. All candidates must complete 601 (2 hrs.) and are expected to attend 601 during their Ph.D. program.

Each candidate must pass both written and oral comprehensive examinations prior to admission to candidacy. Major professors will advise candidates on competencies expected. A final oral examination is required that includes a defense of the dissertation and subject matter that the student's committee considers appropriate.

GRADUATE COURSES

430 Sensory Evaluation of Food (3) Principles and methods of sensory evaluation of foods. Prereq: Basic statistics. 2 hrs and 1 lab. F
452 Science of Dairy Foods (3) Science and technology of processing of milk and its products. Prereq: Food Laws and Regulations, Food Chemistry, Food Microbiology and Lab, and Food Preservation or consent of instructor. 2 hrs and 1 lab. Sp
460 Meat Science (3) Muscle characteristics of meat animals, muscle structure and composition, identification, curing, freezing and cookery. Prereq: Food Industry or consent of instructor. Sp
469 Meat Science Lab (1) Sensory and processing methods for beef, pork, lamb and poultry. Coreq: 460. Sp
470 Food Crop Products (3) Food products from plants; types, manufacturing systems, quality attributes and utility. Prereq: Food Preservation and 3 hrs biological science or consent of instructor. Sp
480 Cereal Science and Bakery Products (3) Chemistry and technology of processing cereal grains, interactions of ingredients during production and storage of baked products. Prereq: Food Laws and Regulations, Food Chemistry, and Food Preservation or consent of instructor. 2 hrs and 1 lab. Sp
490 Food Laws and Regulations (3) Laws and regulations designed to preserve safety, wholesomeness, and nutritional quality of United States food supply; precedent case studies and their impacts on laws and regulations. Prereq: The Food Industry; consent of instructor for non-majors. Recommended prereq: Core courses in Food Science and Technology. F
495 Food Processing System Analysis and Evaluation (3) Design and evaluation of food processing operations to produce safe and acceptable quality food. Prereq: Food Chemistry, Food Microbiology, Food Preservation or consent of instructor. Sp
500 Thesis (1-15) F/N/P only. E
501 Seminar (1) Individual reports and discussion on topics from current literature. May be repeated. Maximum 3 hrs. F, Sp
502 Registration for Use of Facilities (3-15) Required for student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E
503 Problems in lieu of Thesis (2-3) May be repeated. S/N only. E
507 Professional Development Seminar (1) Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Ornamental Horticulture and Landscape Design 507, and Plant and Soil Sciences 507. S/N only. F
509 Scientific Communication (1) Same as Agriculture and Natural Resources 509, Animal Science 509, Ornamental Horticulture and Landscape Design 509, and Plant and Soil Sciences 509. F
510 Instrumental Analysis of Food (3) Modern instrumental methods for control of food manufacturing processes. Prereq: Food Chemistry. 2 hrs and 1 lab. F
511 Color of Foods (2) Chemical basis, measurements, and reactions involved in color changes in foods. Manufacture and application of materials used to modify color of foods. Prereq: Food Chemistry or equivalent. 1 hr and 1 lab. F
Forestry, Wildlife and Fisheries

(Majors of Agricultural Sciences and Natural Resources)

MAJORS

Forestry ..................................................... M.S.
Wildlife and Fisheries Science ................. M.S.

George M. Hopper, Head

Professors:
Core, H. A. (Emeritus), Ph.D. .......... Wisconsin
Dearden, B. L., Ph.D. ............... Colorado State
Dimmick, R. W. (Emeritus), Ph.D. ....... Auburn
Hopping, G. M., Ph.D. ............... VPI
Ostermiller, D. M., Ph.D. .......... Syracuse
Pelton, M. R., Ph.D. ............... Georgia
Rennie, J. C. (Emeritus), Ph.D. .......... NC State
Sharpe, J. (Emeritus), D.P.A. .............. Harvard
Stumbo, D. A. (Emeritus), Ph.D. .......... Oregon State
Thor, E. (Emeritus), Ph.D. .......... NC State
Wilson, J. L., Ph.D. .......... Tennessee
Winstorfer, P. M., Ph.D. .......... Iowa State

Associate Professors:
Buehler, D. A., Ph.D. ............... VPI
Fly, J. M., Ph.D. .......... Michigan
Hay, R. L., Ph.D. .......... Duke
Hodges, D. G., Ph.D. .......... Georgia
Scharbaum, S. E. (Liaison), Ph.D. .......... Colorado State

Assistant Professors:
Bond, B. H., Ph.D. .......... VPI
Buckley, D. S., Ph.D. .......... Michigan Tech
Clatterbuck, W. K., Ph.D. .......... Mississippi State
Harper, C. A., Ph.D. .......... Clemson
Knowe, S. A., Ph.D. .......... Georgia
Muller, L. I., Ph.D. .......... Georgia
Van Menen, F. T., Ph.D. .......... Tennessee
Young, T. M., M.S. .......... Tennessee

Graduate study leading to the Master of Science with majors in Forestry and in Wildlife and Fisheries Science is offered by the Department of Forestry, Wildlife and Fisheries. The Master of Business Administration, with a concentration in forest industries management, is available for qualified students. This degree program is offered by the College of Business Administration with participation by the Department of Forestry, Wildlife and Fisheries. The Doctor of Philosophy can be achieved through the University's Department of Ecology and Evolutionary Biology.

The mission of the Department of Forestry, Wildlife and Fisheries is to advance the management, utilization, and appreciation of natural resources in Tennessee, the region and beyond through programs in teaching, research and extension.

THE MASTER'S PROGRAMS

Both thesis and non-thesis options are available for the major in Forestry; a thesis is required in Wildlife and Fisheries Science. For admission, the student must have a Bachelor's degree from an accredited institution in forestry, wildlife, fisheries, or other natural resource area. Applicants must take the general Graduate Record Examination (GRE) with minimum scores required. Graduate School rating forms or letters of recommendation from three individuals familiar with the applicant's academic ability are required. The department also has an application that must be submitted at the time of application to The Graduate School.

Thesis Option
1. Prior to research for the thesis, the student is required to develop a detailed written research proposal. Registration for 6 hours of Thesis (Forestry 500 or Wildlife and Fisheries Science 500) is required.
2. A graduate committee of no fewer than 3 faculty members must be selected by the second semester of residence. At least one member shall be from outside the department. In addition to the thesis requirement, a minimum of 24 hours of graduate coursework is required. The work must be approved by the student's committee and no more than 10 hours of the minimum can be below the 500 level.
3. All students are required to include Forestry 512 or Wildlife and Fisheries Science 512, Seminar, in their programs. This is required of each graduate student in residence fall semester.
4. An oral examination covering the thesis and coursework is required.

Non-Thesis Option (Forestry only)
1. Thirty-five hours of graduate coursework of which 23 must be at the 500 level or above is required.
2. A graduate committee of no fewer than 3 faculty members will be selected. At least one member shall be from outside the department. The committee will meet and schedule the student's program during the first semester in residence.
3. Three hours of Forestry 511 are required.
4. Nine hours of coursework in the department must be at the 500 level or above, exclusive of Forestry 511.
5. Final comprehensive written and oral examinations shall be taken at the completion of no fewer than 28 hours of approved study.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

Forestry

GRADUATE COURSES

421 Forest and Wildland Resource Economics (3) Production functions, supply-demand and market analysis; non-market programs and projects; economic analysis and decision models; investment and financial analysis; managerial economics; taxes; forest products marketing. Prereq: Forest Resource Analysis or consent of instructor. F

422 Forest and Wildland Resource Policy (3) Policy formulation; criteria for policy determination; forest and wildland law and regulation; theory of natural resource resolution; formal and informal resolution. Prereq: Senior standing or consent of instructor. F

423 Wildland Recreation Planning and Management (3) Planning processes, master and site planning, and design projects; management strategies, methods of visitor and recreation site management; case
580 Advanced Silviculture (3) Silvicultural characteristics, silvicultural practices and systems applied to commercially important hardwoods and softwoods. In-depth analyses of silvicultural principles involved and tools used, prescribed fire, pesticides, in regeneration and management; computer modeling of stand dynamics, structure of forest management as planned or prescribed fire. Prerequisite: Principles of Forest and Wildlife Management or consent of instructor. 1 hr and 2 labs. Sp.

590 Advanced Topics in Forestry (1-3) Recent advances and concepts; research techniques and analysis of current problems. Consent of instructor may be repeated. Maximum 6 hrs.

593 Independent Study in Forestry (1-4) May be repeated. Maximum 6 hrs. E

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when the student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

511 Problem Analysis in Forest Resources (3) Problem identification and solution in forest resources management. Identify, analyze and prepare written report. Topic and report must have approval of graduate committee. Available only to students in nonthesis option for M.S. in Forestry.

512 Seminar (1) Current developments in forestry. Required of all graduate students in residence in fall. May be repeated. Maximum 2 hrs. S/NCO only. F.

520 Advanced Forest Ecology (3) Physiological ecology and adaptations of trees; relationships between overstory structure, microclimate, and understory response; regeneration ecology; competition and effects of natural and human disturbance regimes at multiple scales; forest succession and stand dynamics. Prerequisite: Graduate standing in forestry or biological science, or consent of instructor. Sp, A.

530 Advanced Forest Resource Management (3) Analysis of forest management problems in public and private organizations; current forest regulations and long-term goal programming, as applied to resource management problems; advanced forest investment analysis; decision making for forest resource management; management activities; and methodologies for incorporating non-timber values in forest management operations. Prerequisite: Senior-level forest management or consent of instructor. Sp, A.

540 Genetics in Forestry (3) Genetic improvement of forest trees, selection of superior phenotypes; field testing for genetic variability; tree breeding; development of seed orchards, hybridization; tree cytology; and tissue culture; use of biochemical variation; planning and conducting forest genetics research. Prerequisite: Silvicultural methods and Biology 220 or consent of instructor. Sp, A.

550 Recreation Planning for Forests and Associated Lands (3) Planning process for recreation development on forests and associated lands: analysis and critique of specific contemporary alternatives. Overnight field trips. Prerequisite: Senior-level recreation in forest recreation or consent of instructor, F, A.

570 Management & Policy of Forest Resource Organization (3) Theory and application of management as applied to natural resource organizations: institutional definition and change, strategic planning, and organizational development. Development of policy as planning tool and as results from conflict resolution. Linkage between policy development and implementation, and structure and management of organizations. Prerequisite: Forest administration and policy or consent of instructor. F, A.

Wildlife and Fisheries Science

GRADUATE COURSES

440 Wildlife Techniques (2) Methods of wildlife management, identification of wildlife habitat, wildlife capturing techniques and management plans for wildlife management. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field.

442 Fisheries Techniques (2) Active and passive sampling techniques for fish and aquatic organisms; population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination and incremental growth analysis; laboratory equipment and instrumentation usage and maintenance; safety in sampling methods. Weekend field trip. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field.

443 Fisheries Science (3) Quantification and management of freshwater fisheries: population estimation, age and growth, biological assessment, and stocking. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp.

444 Ecology and Management of Wild Mammals (3) Biological and ecological characteristics of game mammals and endangered mammals. Current principles and practices of wildlife and mammal management. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp.

490 Ethics in Wildlife and Fisheries Management (1) Ethical bases for decision-making and application of methodologies in practice of wildlife and fisheries management. Seminars by ethicists, wildlife and fisheries scientists and managers, and foresters to acquaint students with diverse perspectives of ethical behavior in practices of wildlife and fisheries management. Lectures, panel discussions, and case studies. Team taught. Prerequisite: Senior standing. Sp.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when the student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NCO only. E.

512 Seminar in Wildlife and Fisheries Science (1) Current developments in wildlife and fisheries science. Required of all graduate students in residence in fall. May be repeated. Maximum 2 hrs. S/NCO only. F.

520 Planning and Administration of Fisheries and Wildlife Programs (2) Factors influencing policy and program planning activities of fisheries and wildlife agencies. Decision-making policies, case histories. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab. Sp.

525 Endangered Species Management and Conservation of Biodiversity (2) Status, ecology and management of endangered wildlife and plant species. Historic aspects, policy implications and philosophical issues surrounding recovery efforts. Approaches to monitoring and management for biodiversity. Prerequisite: Graduate standing or consent of instructor. (Same as Comparative and Experimental Medicine - Veterinary Medicine 530). F.

530 Wildlife Diseases (2) Necropsy of birds and mammals. Recognition of various diseases and methods of preparing pathological materials in field and laboratory. Investigative procedures concerning wildlife diseases. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. (Same as Comparative and Experimental Medicine - Veterinary Medicine 530). F.

540 Predator Ecology (2) Dynamics of terrestrial vertebrate predator populations in human-altered and relatively unaltered environments. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field.
The department offers the thesis and non-thesis options for the Master of Science. Both options require a minimum of 30 semester hours beyond the completion of a terminal degree program. At least two-thirds of the total hours in the degree program must be at or above the 600 level and must include 501 (at each offering during residency), 504 and 3 semester hours at the 600 level. In the thesis option, 6 hours must be Thesis 500. A final examination is required in both programs.

The master's program emphasizes development of an interdisciplinary interest in the student's area of research specialization. Additional tools, including language, are required as appropriate to the student's area of specialization. Examinations required for admission to candidacy include a written comprehensive examination, comprised of written examinations in which the student will be tested on his/her knowledge of two special fields, and related areas of geography. Oral examination on the student's program, the special fields and related areas, and the dissertation proposal. All parts of the written examination should be taken within the same semester.

American History: includes the study of foreign areas, traditional material culture and rural settlement, examples from eastern North America and selected foreign area. Prereq: World Geography or consent of instructor. 2 hrs and 2 labs.

Graduate Courses

501 Quantitative Methods in Geography (3) Geographical data analysis and techniques for geographical data, analysis, and interpretation of areal units. Prereq: Statistical Reasoning or two semesters of calculus or consent of instructor.

421 Geography of Folk Societies (3) Geographical study of folk culture, traditional material culture and rural settlement, examples from eastern North America and selected foreign areas. Prereq: World Geography or Cultural Geography: Core Concepts or consent of instructor.

423 Geography of American Popular Culture (3) Geographical study of popular cultures, youth cultures in the United States. Prereq: Cultural Geography: Core Concepts or consent of instructor. (Same as American Studies 423.)

425 Historical Geography of the United States (3) Survey of changing human geography of the United States during four centuries of settlement and development. Changing population patterns, development of agricultural regions, and patterns of urban-industrial development. Prereq: Regional Geography of the United States and Canada or consent of instructor.

433 The Land-Surface System (3) Characteristics of surface form, water, vegetation, and surface materials, and their regional interrelationships. People as evaluators and agents of change. Prereq: Geography of the Natural Environment or consent of instructor.

434 Climatology (3) General circulation systems leading to world patterns of climates. Climatic change and modification, and interrelationships of climate and human activity. Prereq: Geography of the Natural Environment or Meteorology or consent of instructor.

435 Biogeography (3) Changing distribution patterns of plants and animals on a variety of spatial and temporal scales. Effects of continental drift, Pleistocene climatic change, and human activity on world biota. Prereq: Geography of the Natural Environment or consent of instructor.

436 Water Resources (3) Global water resources and hydrologic processes: water availability, flooding, and water quality issues from physical and economic perspectives. Prereq: Geography of the Natural Environment or consent of instructor.

439 Plant Geography of North America (3) Characteristics and distribution of major plant communities of the United States, Mexico, and Central America. Relationships to climate, soil, fire, and human disturbance. Prereq: Geography or consent of instructor. Coursework in geography or botany or consent of instructor.

441 Urban Geography of the United States (3) Concepts and theories concerning development and significance of systems of cities and internal morphologies of cities in the United States. Prereq: World Geogra-
443 Rural Geography of the United States (3) Geographical appraisal of rural areas of United States: small towns and urban fringes. Problems and potentials of rural America. Prereq: Geography or Econo-

momic Geography: Core Concepts or consent of instructor. Writing intensive. (Same as Urban Studies 441.)

444 Geography of Resources (3) Study of factors related to variations in resource availability from time to time and place to place; energy and metallic resources. Prereq: World Geography or Econo-
mic Geography: Core Concepts or consent of instructor. Writing intensive. (Same as Geology 444.)

445 Geography of Transportation (3) Examination of transportation systems, their effects on trade pat-
terns, land use, location problems, and development. Prereq: Economic Geography: Core Concepts or consent of instructor.

450 Process Geomorphology (3) Study of processes that contribute to landscape evolution. Prereq: Geology 450.

468 Teaching and Learning Geography (3) Prepara-
tion of prospective teachers in content, skills, strate-
gies, and understanding needed for effective teach-
ing and assessment of geography in K-12 schools. Course organization and content based largely on that of National Geography Standards.

500 Thesis (1-15) P/NP only. E

501 Colloquium in Geography (1) Discussion of departmental research literature and general topics. Registration required of resident graduate students whenever offered. May be repeated. Maximum 4 hrs. May be applied toward graduate degree. S/NC only.

502 Registration for Use of Facilities (2-15) Re-
quired for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

504 Introduction to Geographical Research (1) Research interests and methods of departmental faculty. Research frontiers in geography. Required of new graduate students.

505 Directed Research (2-6) Research on problems as defined by individual students. Prereq: Written con-
sent of instructor and department prior to registration. May be repeated with consent of instructor. Maximum 9 hrs. S/NC or letter grade.

506 Directed Readings (2-6) Readings on topics of interest as defined by individual students. Prereq: Written consent of instructor and department prior to registration. May be repeated with consent of instructor. Maximum 9 hrs. S/NC or letter grade.

508 Topics in Geography (2-3) Topics vary. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs. S/NC or letter grade.

510 Geographic Software Design (3) Algorithms for spatial analysis, software design, and program imple-
mentation in stand alone and distributed computing environments. Prereq: Consent of instructor.

513 Topics in Remote Sensing (3) Applied research using imagery for interpretation and mapping of geo-
ographic data. Prereq: 413 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

515 Topics in Quantitative Geography (3) Multi-
ivariate analysis applied to problems in geography; research problems utilizing appropriate computer pro-
grams; usefulness to geographic research of tech-
niques developed by other disciplines. Prereq: 415 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

517 Geographic Information Management and Pro-
cessing (3) Concepts and methods in management of geographic information. Database design, manipula-
tion, sampling and analysis. Prereq: Consent of in-
structor.

519 Graduate Practicum in Cartography/Remote Sensing/GIS (2-6) Prereq: Written consent of depart-
ment before registration. May be repeated with consent of instructor. Maximum 6 hrs.

521 Topics in Cultural Geography (3) Examination of trends, problems, and methods in cultural geogra-
phy. Prereq: 421 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

532 Topics in Global Change (3) Emerging trends, anticipated problems and methods in global change research and response. Prereq: 434 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

533 Topics in Physical Geography (3) Examination of trends, problems, and methods in geography of land

surface system or in modern climatology. Prereq: 433 or 454 and consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

534 Topics in Climatology (3) Trends, problems and methods in area of climatology. Prereq: 434 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

535 Topics in Biogeography (3) Examination of trends, problems, and methods in biogeography. Prereq: 435 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

541 Topics in Urban Geography (3) Analysis of current research literature, internal morphology, urban problems and urban spatial behavior. Prereq: 441 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

549 Topics in the Geography of Transportation (3) Examination of trends, problems, and methods in transportation geography and transportation networks. Prereq: 449 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

577 Biological Conservation (3) Analytical treat-
ment of politics, policies, and forms of biological conservation as practiced in U.S. and abroad. Prereq: Consent of instructor.

591 Foreign Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

592 Off-Campus Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

596 Geographic Concept and Method (3) Traditional and modern geographic thought; readings on nature, scope, problems, and methods of geography. Prereq: Consent of instructor.

600 Doctoral Research and Dissertation (3-15) P/NP only. E

609 Seminar in Geography (2-3) Topics vary. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs. S/NC or letter grade.

613 Seminar in Natural Hazards (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

633 Seminar in Physical Geography (3) Prereq: 533 or consent of instructor. May be repeated. Maximum 6 hrs.

634 Seminar in Climatology (3) Prereq: 534, 532 or consent of instructor. May be repeated. Maximum 6 hrs.

635 Seminar in Biogeography (3) Prereq: 535 or consent of instructor. May be repeated. Maximum 6 hrs.

641 Seminar in Urban Geography (3) Prereq: 541 or consent of instructor. May be repeated. Maximum 6 hrs.

643 Seminar in Rural Geography (3) Prereq: 443 or consent of instructor. May be repeated. Maximum 6 hrs.

649 Seminar in Geography of Transportation (3) Prereq: 549 or consent of instructor. May be repeated. Maximum 6 hrs.

663 Seminar in Geography of the American South (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

673 Seminar in Geography of Latin American (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

677 Seminar in Biological Conservation (3) Conduct of original research. Prereq: 577 or consent of instructor. May be repeated. Maximum 6 hrs.

**Geological Sciences**

(College of Arts and Sciences)

**MAJOR**

**DEGREES**

**Geology** ........................................ M.S., Ph.D.  

William M. Dunne, Head

**Professors:**  
Broadhead, Thomas W., Ph.D. .......... Iowa  
Driese, Steven G. (Liaison), Ph.D., Ph.D. Wisconsin  
DuBois, William M., Ph.D. ............. Bristol  
Hatcher, Robert D., Jr. (Doris D.  
Scientist), Ph.D. ......................... Tennessee  
Kopp, Otto C., Ph.D. ..................... Columbia  
Labotka, Theodore C., Ph.D. ......... Caltech  
McLaughlin, Robert E. (Emeritus),  
Ph.D. ..................................... Tennessee  
McSweeney, Harry Y., Ph.D. .......... Harvard  
Misra, Kula C., Ph.D. ................. Western Ontario  
Taylor, Lawrence A., Ph.D. .......... Lehigh  
Walker, Kenneth R. (Carden Prof.),  
Ph.D. .................................... Yale

**Associate Professors:**  
Byerly, Don W., Ph.D. ................. Tennessee  
Clark, G. Michael, Ph.D. .............. Penn State  
McKay, Larry D. (Jones Prof.), Ph.D., Ph.D. Waterlo  
Mckinney, Michael L., Ph.D. ........ Yele  
Mora, Claudia L., Ph.D. .............. Wisconsin  
Williams, Richard T., Ph.D. .......... VP &SU

**Assistant Professor:**  
Kah, Linda C., Ph.D. ................. Harvard

The Department of Geological Sciences offers both the M.S. and Ph.D. degrees in Geology. Persons interested in these programs should contact the Director of Graduate Admissions in the department.  

For admission, an applicant must provide transcripts of previous university work, two rating forms or letters of recommendation, and GRE scores (general). Students are not normally admitted under non-degree status. Prerequisites for both degrees is a Bachelor's degree, including coursework in mineralogy, optical mineralogy, petrology, stratigraphy, paleontology, structural geology, and field geology. One year each of coursework in calculus and chemistry and one year of coursework in biology, physics, or statistics are also required. Applicants lacking any of these may be admitted, but the deficiencies must be removed within the first year without graduate credit. Substitutions may also be allowed.

**THE MASTER'S PROGRAM**

The department offers the thesis option in the master's program. Graduation requires successful oral defense of a written thesis.
a minimum of 3.0 GPA in all graduate coursework.

Course requirements are a minimum of 30 semester hours, including:
1. Six hours of Thesis 500.
2. Registration in 595 during the first two years in residence. Two hours may be counted toward the 30-hour minimum. This requirement may be waived in unusual circumstances.
3. Sixteen hours of geology courses, with at least 14 hours at the 500 or 600 level, including at least one course from any three of the following five groups:
   - Group 1: 410, 460, 480, 530, 563, 565.
   - Group 2: 465, 485, 545, 566, 568.
   - Group 3: 470, 570, 571, 575, 576.
   - Group 5: Any 400- or 500-level courses with graduate credit from related departments (allied sciences, mathematics, and engineering), selected with approval of advisor.
4. Eight hours of additional graduate coursework.

THE DOCTORAL PROGRAM

The prerequisite for the Ph.D. program, in addition to that for the M.S. program, is either a master's degree in Geology, or a Bachelor's degree plus completion of 9 hours of coursework from the list in #3, above, including one course from each group. These courses may be taken while completing other course requirements.

Graduation requires passing a comprehensive examination, taken no later than the end of the second year, completion of all course requirements with a minimum 3.0 GPA, completion of the language requirement, and successful oral defense of the dissertation.

The comprehensive examination includes both written and oral parts in which the candidate will be tested on his/her knowledge of the area concerning the proposed dissertation and of related fields. The candidate is expected to be conversant in a wide field of geological sciences.

A minimum of 24 hours of gradated coursework beyond the master's degree is required in addition to the 24 hours of Dissertation 600. The coursework includes the sum of 9 hours of 600-level geology courses, 9 hours of 500-level or higher geology courses, and 6 hours of additional graduate courses. Extra-departmental coursework is encouraged.

The student must demonstrate a reading knowledge of a foreign language in which there is a body of geologic literature, as approved by the student's dissertation committee. The foreign language requirement may be waived for Ph.D. students whose native language is not English and who have demonstrated mastery of the English language, as determined by the student's dissertation committee.

GRADUATE COURSES

401 Quantitative Methods in Geology (3) Application of calculus to and differential equations to problems in earth sciences. Examples of distribution equation in hydrogeology: wave equation in geophysics; mechanical modeling and boundary conditions in structural geology and tectonics. Prerequisite: The Dynamic Earth or Earth, Life, and Time, 2 semesters of Calculus.

410 Mineral Science (3) Crystal chemistry of rock-forming minerals. Interaction of electromagnetic radiation and crystal size. Optical properties of minerals, visible and infrared spectroscopy, and x-ray diffraction. Laboratory exercises emphasize thin section and X-ray diffraction methods of mineralogy. Prerequisite: 310. 2 hrs and 1 lab.

411 Optical Mineralogy (2) Laboratory course on principles of optical mineralogy. Use of petrographic microscope to identify rock-forming minerals with application to petrology and environmental mineralogy. Prerequisite: Mineralogy.

412 Elements of X-ray Diffraction (2) Laboratory course on principles and applications of X-ray diffraction. Phase identification, quantification determination of mineral abundances in mixtures, and crystal structure determination. Prerequisite: Mineralogy.

420 Paleoclimatology (5) Principles of paleoclimatology as applied to fossils and fossil assemblages: data collection and interpretation. Laboratory designed around preparation of scientific reports based on field and laboratory analysis. Writing emphasis course. 3 hrs and 1 lab.

421 Invertebrate Paleontology (4) Survey of invertebrate animal phyla: skeletal structure and preservation, functional morphology, ecology, and geographic distribution. Prerequisite: Paleobiology or consent of instructor. 2 hrs and 2 2-hr labs.

440 Field Geology (Summer) Field study course for advanced undergraduate geology majors and first-year graduate students in geology. The course is an enrichment experience and requires full time of contact. Synthesis of major aspects of geological sciences in societal context. Field techniques demonstrated, practiced, and applied to solution of geologic problems. Prerequisite: Completion of major core courses and consent of instructor.

450 Process Geomorphology (3) Integrative approach to development of surface of earth based upon case histories, maps, remapping imagery, and physical distribution. Prerequisite: 101-02. (Same as Geology 450.) 2 hrs and 12-hr lab.

455 Basic Environmental Geology (3) Applications of geologic sciences toward comprehension of effects of geological processes on human and effects of human activities on earth's environment. Prerequisite: The Dynamic Earth. 2 hrs and 1 3-hr lab or field period.

460 Principles of Geochemistry (3) Application of chemical principles to geologic problems. Crystal chemistry and relation between basic atomic structure and distribution of elements in earth's crust. Prerequisite: Chemistry 120-20. Recommended prerequisite: 330. 2 hrs and 1 lab.

470 Applied Geophysics (3) Basic principles of geophysical exploration techniques and environmental problems. Seismic and electromagnetic methods. Prerequisite: 6 hours of geology courses numbered above 300, Elements of Physics.

471 Fieldwork in Geophysics (2) Geophysical investigations applied to solution of problems in tectonics, hydrogeology, or environment. Short field course off-campus. Requires a field trip of 2 or more weeks. Prerequisite: 470 or consent of instructor.

475 Physical and Chemical Systems of the Earth (3) Development of physical laws governing fluid. Use of nodal diagrams to present. The role of rotation and motion of the hydrosphere, crust, mantle, and core. Interdependence of geological, volcanic, and plate tectonics. Geomagnetism, chemical and isotopic processes of the interior, and earth's environment. Historical perspective on major controversies of past, and problems unresolved today. Precondition: 300 and above. 2 hrs and 1 discussion.

480 Principles of Economic Geology (4) Ore-forming processes, classification of mineral deposits, survey of different types of mineral deposits with examples, and metallogenic provinces. Recommended prerequisite: 460. 1 hr and 2 2-hr labs.

485 Principles of Hydrogeology (3) Physical principles of flow, flow equations, geologic controls, seepage analysis, and water quality. Use of field and laboratory techniques to transport processes. Prerequisite: The Dynamic Earth; Calculus; Fundamentals of Physics or equivalent.

486 Hydrogeology Laboratory (1) Application and demonstration of hydrogeological principles in field and laboratory in soil, or consent. Prerequisite: 485 or Environmental Engineering 535 or consent of instructor.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for students not officially registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

506 Structure of the Southern and Central Appalachians (2) Structural development of Southern and Central Appalachians from extensional Late Proterozoic through recent. Study of structural and tectonic margin through processes related to compressional events producing accretionary elements that formed Appalachian structures through the Paleozoic. Comparisons to similar orogens. Prerequisite: Structural Geology.

510 Clay Mineralogy (3) Origin, chemistry, structures, and properties of clay minerals; application of analytical techniques to clay mineral studies. Prerequisite: 310 and 566 or equivalent. 2 hrs and 1 lab.

521 Data Analysis in Geology and Environmental Science (3) Application of statistical and computer techniques in solving geological and other scientific problems. Analyzing data using computers to analyze geological data: environmental problems.

530 Petrogenesis of Crystalline Rocks (4) Origin and properties of igneous and metamorphic rocks. Magnetism and structure of basaltic provinces. Prerequisite: Laboratory involves petrographic study of crystalline rocks in thin section. Prerequisite: 410. 3 hrs and 1 lab.

535 Ground Water Hydrology (3) (Same as Environmental Engineering 535.)

540 Seminar in Local Geology (1) Introduction of local geology of different areas. Prerequisite: 1 hr of field trips.

545 Sandstone Petrology/Physical Sedimentology (4) Field and microscopic analysis of terrigenous and clastic rock types; physical processes of sedimentation, transport of sediment, and formation of sedimentary structures. Prerequisite: 340 or equivalent. 3 hrs and 1 lab.

546 Carbonate Sedimentology (4) Environments of deposition of modern and ancient carbonate sediments and diageneric processes; applications of modern and ancient carbonate sediments; relationships to other environments. Prerequisite: 2 hrs and 1 lab.

550 Regional Geomorphology (3) Integrative approach to study of natural geomorphological regions stressing links and similarities across boundaries, unique characteristics of major divisions, and cross-cuts. May be repeated with consent of instructor. Maximum 6 hours.

556 Ice-Age Environments and Global Climate Change (3) (Same as Ecology and Evolutionary Biology 556.)

557 Quaternary Ecology (3) (Same as Ecology and Evolutionary Biology 557.)

563 Stable Isotope Geochemistry (3) Theoretical aspects of stable isotope fractionation and applications to isotopic systems. Isotope equity exchange, variations in natural waters, isotopic fractionation, and isotopic systems. Prerequisite: General Chemistry or equivalent.

566 Chemical Petrology (3) Application of thermodynamics to geologic materials. Thermodynamics of condensed phases, solutions, transport properties, and stability. Heterogeneous multicomponent phase equilibrium, and formation of chemical equilibrium. Prerequisite: 120 or equivalent. Prerequisite: Physical Chemistry.

566 Geochemical Analysis (3) Collection and treatment of chemical and isotopic data. Application of geochronological techniques using electron microprobe, x-ray fluorescence, and atomic absorption spectrophotometry. Techniques. Prerequisites: 310 or consent of instructor. 2 hrs and 1 lab.

570 Advanced Structural Geology (4) Current topics in structural geology and tectonics of mountain belts.
recent literature. Prereq: 370 or equivalent, or consent of instructor. 3 hrs and 1 lab or seminar.

572 Fracture Analysis (3) Field and subsurface characterization and mechanical development of natural fractures; role in groundwater flow. Prereq: Structural Geology or equivalent, or consent of instructor. (Same as Civil Engineering 572.)

575 Tectonics (4) Evolution of Earth's lithosphere in context of plate tectonics theory. Formation of continents through comparative anatomy of mountain belts, including Appalachian, Alps, Urals, Caledonians, Cordillera, Andes, and Himalayas. Prereq: Structural Geology or consent of instructor. 3 hrs and 1 seminar.

576 Reflection Seismology (3) Imaging subsurface features using reflected seismic waves. Energy sources, modes of wave propagation, field procedures, computer data processing, and pitfalls. Applications to tectonic and environmental problems. Prereq: 470 or consent of instructor.

585 Contaminant Hydrogeology (3) Physical transport processes, isotopes and groundwater age dating, processes influencing inorganic, organic and microbial contaminants, sampling and monitoring methods, remediation of contaminated groundwater, aquifer protection. Prereq: 485 or 535, 460 or 561, or Environmental Engineering 535 or equivalent; and consent of instructor.

586 Field and Laboratory Methods in Hydrogeology (3) Research methods. Measurement of hydraulic properties; drilling, sampling and instrumentation; tracer experiments. Formulating hypotheses and research plans. Prereq or coreq: 485 or Environmental Engineering 535; and consent of instructor.

590 Special Problems in Geology (1-3) Directed study or special topics. Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

595 Selected Topics in Geology (1) Presentation of research by faculty and visiting scientists. Registration required each semester for resident full-time graduate students, except in summer and when registered for 596. S/NC only.

596 Geology Colloquium 1) Preparation and oral presentation of scientific material. Grade based on content, preparation, presentation, and instructor critique in departmental seminar. Taken only once during residence for each graduate student.

600 Doctoral Research and Dissertation (3-15) P/NP only. E

620 Seminar in Paleontology (3) May be repeated with consent of department. Maximum 9 hrs.

630 Seminar in Petrology (3) May be repeated with consent of department. Maximum 9 hrs.

640 Seminar in Sedimentary Geology (3) May be repeated with consent of department. Maximum 9 hrs.

650 Seminar in Geomorphology and Quaternary Geology (3) May be repeated with consent of department. Maximum 9 hrs.

660 Seminar in Geochemistry (3) May be repeated with consent of department. Maximum 9 hrs.

670 Seminar in Structural Geology (3) May be repeated with consent of department. Maximum 9 hrs.

675 Seminar in Geophysics (3) Advanced treatment of selected topics in geophysics. Prereq: 470 or consent of instructor.

685 Seminar in Hydrogeology (3) May be repeated with consent of department. Maximum 9 hrs.

German
See Modern Foreign Languages and Literatures

Health and Safety Sciences

(College of Human Ecology)

MAJORS

Health Promotion and Health Education ... M.S. Health Education and Service ... M.S.

Charles B. Hamilton, Head

Professors:
Gorski, Jane, Dr.P.H. .................. UCLA
Hamilton, Charles B. (Liaison), Dr.P.H. .................. Oklahoma
Kirk, Robert H., M.S.-M.P.H. .................. Indiana
Wallace, Bill C. (Liaison), Ed.D. .................. Northern Colorado

Associate Professors:
Pursley, R. Jack, Ph.D. .................. Iowa
Zemel, Paula, Ph.D. .................. Wayne State

Assistant Professors:
Ellison, Jack S. (Liaison), Ed.D. ...... Tennessee
Smith, Susan M. (Liaison), Ed.D. ...... Tennessee

The Health and Safety Sciences Department offers graduate programs leading to the Master of Science with majors in Health Promotion and Health Education; and Safety Education and Service; and the Master of Public Health degree in Public Health. The department provides doctoral preparation through a concentration in Human Ecology. Inquiries should be directed to the department head. Application packets are available by request to department.

The department fosters development of pre-professional and professional competencies by those interested in the disciplines of health education/promotion, public health, and safety. The Health and Safety Sciences academic programs emphasize health promotion lifestyle behaviors and health protection (regulatory, environmental and safety) strategies for improving individual and community well-being, directly relating to two UT thematic areas of strength, health and biomedicine and children and families. The faculty are committed to the educational value of community-based service learning, applied research, and community outreach. For more information, http://hsse.utk.edu.

Health

A graduate program is available leading to the Master of Science with a major in Health Promotion and Health Education (thesis and non-thesis options), requiring completion of 30 semester hours. The program emphasizes research skills development by those already employed in the health professions with each student completing a realistic health-related research proposal as a major developmental activity.

The Doctor of Philosophy with a major in Human Ecology offers a concentration in community health. Perspectives of social, behavioral and biomedical sciences are incorporated with educational models appropriate for addressing community health needs.

The Ph.D. Concentration

The community health concentration integrates the behavioral and natural sciences with public health, community health education, health promotion and the safety sciences to prepare scholars with an interest in improving the health of the nation. Requirements include:

1. Minimum 21 hours of foundation courses: 610, 620, 6 hours of statistics, 3 hours of specialized research methods, and 6 hours of natural or behavioral sciences.


3. Minimum 12 hours in supporting specialization in a focused area: public health, safety, gerontology, or a program approved by doctoral committee.

4. Minimum 6 hours in a cognate area.


Graduate Courses

400 Consumer Health (3) Survey of major consumer health care providers and health care services; selecting, purchasing, evaluating and financing medical and health care services/products. (Same as Public Health 400.) Sp

405 Alcoholism and Alcohol Education (3) Problems of alcoholism. Factors which make alcoholism serious and health and safety problems. Various types of instructional/educational and intervention programs. F

406 Death, Dying and Bereavement (3) Aspects of dying, death and handling trauma of loss. Medical, financial, physical, legal and social implications of death. F, Sp

420 Sex Education as it Relates to Human Sexuality (3) Exploration of science of human sexuality, trends, issues, and content of sex education. E

425 Women's Health (3) Factors influencing women's health and well-being in society and the health care system. Health problems/concerns of women and techniques for prevention, maintenance and/or correction. (Same as Women's Studies 425.) F

430 Suicide and Crisis Intervention (3) Factors which make suicide a serious health problem. Assessment, intervention, and prevention techniques. Sp, F

435 Substance Use and Abuse (3) Drug and alcohol abuse problems and suspected causes; pharmacology of drugs and effects on society; strategies for intervention and education. Sp

465 Aging and Health (3) Aging process in health perspective as related to health promotion and wellness of aged. F, Sp

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

520 Sex Education and Human Sexuality (3) Advanced in-depth discussion of educational and health counseling theories, techniques, materials used in school, community, or health care facility. Sp
Public Health

Graduate study with a major in Public Health leads to the Master of Public Health (M.P.H.). Three professional preparation concentrations are available: community health education, gerontology, and health planning/administration. Preparation for professional practice in improving community health emphasizes a population perspective, service-learning, and application opportunities through rigorous internships. The M.P.H. program is accredited by the Council on Education for Public Health. A minor in statistics is available to interested M.P.H. students due to public health affiliation with the Intercollegiate Graduate Statistics Programs.

ADMISSION REQUIREMENTS

A statement of the applicant's educational and career goals and three rating forms are required. Request application packet from the department. Preferential consideration for admission to degree status shall be given to those with a minimum undergraduate grade-point average of 2.8 and with at least one year of professional experience in a health-related occupation. As a restricted program, non-degree admission requires department recommendation. Deadlines for completed applications are 1 February for Summer term and 1 April for Fall semester.

THE MASTER'S PROGRAM

The M.P.H. is a non-thesis program requiring completion of 36 semester hours of coursework including 9 weeks of field practice. The field internship provides a full-time experience with an affiliated health agency or organization offering one or more health programs. Of importance, field practice allows the student to apply academic theories, concepts, and skills in an actual work setting. Students must complete all assigned prerequisite courses and 21 semester hours of the curriculum with a minimum overall GPA of 3.0 prior to placement in the field.

As an alternative to field practice, preparation of a master's essay may be used to fulfill the professional skills development component of the curriculum. Approval must be received from the Public Health Academic Program Committee and is contingent on consent of major advisor. Additional research methods courses. Written guidelines stipulating expectations and eligibility criteria are available.

Requirements include:
1. Public Health Foundation courses (16 hours): 509, 510, 520, 530, 540, 555.
2. Internship (6 hours): 587, 588.
3. Concentration of Study (16 hours).

Required and recommended electives will be selected by the student in consultation with the major advisor. A list of courses is available for each concentration: community health education, gerontology, and health planning/administration.

For more information, refer to the website: http://hss.he.utk.edu/pubhealth.

DUAL M.S.-M.P.H. PROGRAM

The College of Human Ecology offers a coordinated dual program leading to the conferred of both the Master of Science with a major in Nutrition (public health nutrition concentration) and the Master of Public Health. The dual program allows students to complete both degrees in less time than would be required to earn both degrees independently.

The program is designed to meet the needs of students who are interested in the benefits of majors in both nutrition and public health. Therefore, it accommodates the interests of students who: 1) plan a career in public health nutrition and want to acquire the knowledge and skills of the nutritionist and public health professional; 2) plan a career in nutrition and want to acquire the knowledge and skills of the nutritionist and public health professional; or 3) plan a career in public health and want to acquire the knowledge, skills and perspective of the nutritionist.

Admission Requirements

Applicants for the M.S.-M.P.H. program must make separate application to, and be competitively and independently accepted by, the Department of Nutrition for the M.S., Department of Health and Safety Sciences for the M.P.H., and the Public Health Academic Program Committee.

Students who have been accepted by both departments may apply for approval to pursue the dual program anytime prior to, or after, matriculation in either or both departments. Such approval will be granted, provided that dual program studies be started prior to entry into the fourth semester of the M.S. and M.P.H. programs.

Curriculum

A dual degree candidate must satisfy the requirements for both the M.S. (public health nutrition concentration) and the M.P.H. degrees, as well as the requirements for the dual program. All candidates for the dual degree must successfully complete Health and Society (PH 559), two credits of Seminar in Public Health (PH 599), and a minimum of 60 credits. The Department of Nutrition will award a maximum of 9 semester hours of credit toward the M.S. degree for successful completion of approved graduate-level courses offered in the Department of Health and Safety Sciences. The Department of Health and Safety Sciences will award a maximum of 11 semester hours of credit toward the M.P.H. degree for successful completion of approved courses offered in the Department of Nutrition. All courses for which such cross-credit is awarded must be approved by the Public Health Academic Program Committee and the student's graduate committee. A single block field experience (or public health internship) is required of all students and the analytical field paper incorporates public health nutrition and the student's public health concentration. Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward the M.S. or M.P.H. degree for courses taken in the other program, except as such courses qualify for credit without regard to the dual program.

Approved Dual Credit

M.S. courses to be counted toward the M.P.H. program must include at least 10 semester hours of Field Study in Community Nutrition (NTR 515) and 1 semester hour of Graduate Seminar in Public Health (NTR 509). M.P.H. courses to be counted toward the M.S. include Public Health Administration (PH 520), Biostatistics (PH 530), and Epidemiology (PH 540).

MINOR IN GERONTOLOGY

Graduate study in Public Health may pursue a specialized minor in gerontology. This interunit/interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis.
The M.P.H. program in Public Health is available to residents of the state of Arkansas. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

### COURSE REGISTRATION

Non-degree students must obtain permission from the department head to register for 500-level public health courses. Prerequisite coursework assigned as a condition of admission to the M.P.H. program must be completed promptly, with a grade of B or better, typically within the first semester or two of enrollment in graduate studies.

### GRADUATE COURSES

**400 Consumer Health (3)** (Same as Health 400.)

**410 Worksite Health Promotion (3)** Foundations of health promotion programs delivered in worksite that revolve around issues relevant to employees and management: theory, program design, implementation and evaluation from perspective of health promotion specialist. Prereq: Health Education, Promotion, and Behavior. Sp

**493 Directed Independent Study (1-3)** Individual in-depth study of selected issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

**502 Registration for Use of Facilities (3-15)** Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

**509 Graduate Seminar in Public Health (1)** In-depth discussion of timely topics reflecting scope of public health as discipline and its interrelation with other academic and professional disciplines. Speakers from both internal and external. May be repeated. Maximum 4 hrs. (Same as Nutrition 509, Nursing 509, Exercise Science 509 and Social Work 509.) S/NC only. F, Sp

**510 Environmental and Occupational Health (2)** Complexities of personal and ambient environment recognized as individual's response to diverse and dynamic world. Principles of occupational health and safety. Survey of contemporary issues and their implications for healthful living today and in future. F, Sp

**520 Public Health Policy and Administration (3)** Administrative considerations of community-based health care programs and public health practice. Health policy formulation, political environment and governmental involvement in health, legal responsibilities, and managerial concepts/techniques/process. F, Su

**521 Organization Theory and Health Care Delivery (3)** Administrative and organization theory related to health facilities; operation and management of community hospital. Case discussions and problem-solving exercises; managerial functions and skills. F

**523 Management in Extended Care Settings (3)** Managerial concepts and theoretical foundations essential to supervision and administration of domiciliary health services programs. Management and operation of health services programs for patients and clients in settings which provide activities of daily living and special psychosocial environmental needs. Programs for home health services, comprehensive medical rehabilitation, nursing homes, congregate living centers and similar type health programs. Prereq: 521 or consent of instructor. Sp

**525 Financial Management of Health Programs (3)** Financial management concepts and practices applied to health services programs. Fundamentals of budgeting, costing, financing, rate setting, financial reporting and control. Opportunities to apply techniques. Prereq: 520 or consent of instructor. Sp

**530 Biostatistics (3)** Application of descriptive and inferential statistical methods to health-related problems and programs. Microcomputer applications, use and interpretation of vital statistics and introductory research methodology preparatory for first course in epidemiology. Prereq: Graduate statistics or consent of instructor. F, Sp

**540 Principles of Epidemiology (3)** Distribution and determinants of health-related outcomes in specified populations, with application to control of health problems. Historical origins of discipline; epidemiological hypotheses formulation, research design, data and error sources, measures of frequency and association, etiologic reasoning, disease screening, and injury control. Prereq or conorq: 530. F, Sp


**550 Principles and Practices of Community Health Education (3)** Theoretical foundations for community health education; opportunities for skill development in various area of educational processes; and introduction to community health analysis. F

**552 Community Health Problem Solving (4)** Dynamics of community organization, community needs assessment, educational interventions, and application of program planning and evaluation techniques. Opportunity to practice in a setting. Prereq: 550 or consent of instructor. Sp

**555 Health and Society (3)** Understanding of social and behavioral factors which influence health status and care in America. Application to behavior in health-related organization. Social and psychological aspects of disease, sociopolitical aspects of health care delivery systems, political economy of health and illness, impact of social mobility on health and social consequences of health legislation. Sp, Su

**560 Theories and Techniques in Health Planning (4)** Overview of health planning concepts and methodologies; systems-oriented planning process. Major elements of planning: formulation and conceptualization of problem, plan design, evaluation and implementation. Health problems of institutions, communities and selected population groups, appropriate diagnosis, and programs for addressing needs. Sp

**568 Physical Activity and Positive Health (3)** (Same as Exercise Science 568.)

**569 Clinical Exercise Physiology (3)** (Same as Exercise Science 569.)

**580 Special Topics (3)** Prereq: Consent of instructor. May be repeated under different topic. Maximum 6 hrs.

**585 Seminar in Gerontology (1)** (Same as Human Sociology 585.)

**587-88-89 Internship (3, 3, 3)** Internship (community health education, gerontology, or health planning/administration) in either approved organization or research setting under supervision of designated preceptor. Prereq: M.P.H. major, one semester advance notice and consent of major advisor. 587: available only for approved extended placements, S/NC only. E

**590 Research Methods in Health (3)** (Same as Health 590.)

**593 Directed Independent Study (1-3)** Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

**650 Health Aspects of Gerontology (3)** (Same as Health 650.)

**655 Seminar in Nation's Health (3)** (Same as Health 655.)

**660 International Health (3)** (Same as Health 660.)

### Safety

Graduate study with a major in Safety Education and Service (thesis and non-thesis options) leads to the Master of Science degree. The M.S. requires completion of 30 semester hours. Students may elect an internship experience with private industry or nonprofit organizations. Curricular experiences will assist graduate in preparation for certified safety professional examination.

The graduate program contributes to The University of Tennessee's mission of health protection by preparing safety professionals with the knowledge and skills necessary to create and maintain safer human environments in the workplace (industrial and commercial), home, school, and community. The offering of all core classes on an evening class schedule enables those working full-time to pursue the M.S. degree with a major in Safety Education and Service on a part-time basis.

For more information, refer to the website: [http://hns.he.uky.edu/safety](http://hns.he.uky.edu/safety).

### GRADUATE COURSES

**443 Sports & Recreational Safety (3)** Accident prevention and injury control in sports activities; philosophy of sports safety; human environmental factors and interrelationship in sports injury and control; risk-taking and accident tendencies; and contributions of sports medicine to safety. 3 hrs and 2 labs. Sp

**452 General Safety (3)** Principles, practices, and procedures in general safety. Safety problems in school, traffic, recreation, industry, home and other public areas. F, Su

**500 Thesis (1-15)** (P/NP only. E

**502 Registration for Use of Facilities (3-15)** Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

**532 Behavioral Problems in Safety Education & Accident Prevention (3)** Problems of behavior, causes of accidents, and application of principles of psychology in development of safe behavior in all segments of environment. F

**533 Problems and Research in Accident Prevention (3)** Safety problems found in wide variety of accidents that occur in community: their relation to safety research in behavioral sciences as related to variation incidence of accidents. F

**534 Organization, Administration and Supervision of Safety Programs (3)** National, state and local level programs; administrative, instructional, and supervisory aspects. Implementation of relevant programs. Sp

**535 Emergency Management (3)** Civil and defense problems: tornadoes, floods, fires, mass civil disorders, and nuclear and personnel attack by alien countries. Sp

**572 Graduate Workshop in Safety (3)** Special safety education programs. For advanced graduate students, teachers, supervisors, and administrators. May be repeated. Maximum 12 hrs. E

**590 Special Topics (1-3)** Advanced study in selected disciplinary or professional area of safety education/management. May be repeated. Maximum 12 hrs. E

**593 Directed Independent Study (1-3)** Individual identification and study of problem/issue in safety. Extensive reading and critical analysis of safety literature. Specific proposal to instructor before registration. May be repeated. Maximum 12 hrs. E

**601 Internship/Research in Safety and Health (3-6)** Field experience: Significant problem identified, researched, and reported in acceptable form. May be repeated. Maximum 6 hrs. (Same as Health 601.) E
History
(College of Arts and Sciences)

MAJOR

History..............................................M.A., Ph.D.

Head

Professors:
Bergeron, Paul H., Ph.D. .................Vanderbilt
Chmielewski, Edward V. (Emeritus),
Ph.D. .................................................Harvard
Cutter, E. Wayne, Ph.D. ................Texas
Farris, W. Wayne, Ph.D. .....................Harvard
Finger, John R., Ph.D. ......................Illinois
Haas, Arthur G., Ph.D. .....................Chicago
Hao, Yen-Ping (Lindsay Young Prof.),
Ph.D. .................................................Harvard
Haskins, Ralph W. (Emeritus),
Ph.D. .................................................California
Klein, Milton M. (Emeritus) (Distinguished
Prof.), Ph.D. ..................................Columbia
Moser, Harold, Ph.D. .....................Wisconsin
Norrell, R. Jeff (Bernadotte Schmitt
Prof.), Ph.D. ..................................Virginia
Ratner, Lorman A. (Emeritus), Ph.D. ....Cornell
Utleyn, Jonathan G. (Emeritus) ......Illinois
Wheeler, W. Bruce, Ph.D. .................Virginia

Associate Professors:
Ash, Stephen V., Ph.D. ......................Tennessee
Bast, Robert J., Ph.D. ......................Arizona
Boehstedt, John, Ph.D. ....................Harvard
Bradley, Owen P., Ph.D. ....................Cornell
Brummett, Paul, Ph.D. ..................Chicago
Burman, Thomas E., Ph.D. ................Toronto
Diacon, Todd A., Ph.D. ....................Virginia
Higgs, Catherine A., Ph.D. .................Yale
Johnson, Charles W., Ph.D. ...............Michigan
Muldowny, John, Ph.D. ...................Yale
Pinckney, Paul J., Ph.D. .................Vanderbilt

Assistant Professors:
Appier, Janis, Ph.D. ..................California (Riverside)
Brooks, Kathleen, Ph.D. ..................Chicago
Dessel, J. P., Ph.D. ..................Arizona
Glover, Lori, Ph.D. .....................Kentucky
Jillevic, Vojtes, G. Ph.D. ..............Pennsylvania
Pfeifer, G. Kurt, Ph.D. .................Rutgers

The Department of History offers
graduate study leading to the Master of Arts
and Doctor of Philosophy degrees. The M.A.
program includes a thesis and non-thesis
option. The doctoral program has concentra-
tions in American and European history with
special focuses in the areas identified under
group II doctoral fields and group III teaching
fields.

Detailed information may be obtained from
the Director of Graduate Studies in History
who also advises all incoming students.

THE MASTER'S PROGRAM

Admission Requirements
1. Successful completion of a baccalaure-
ate degree from an accredited institution,
preferably with a major in history.
2. Acceptable scores on the Graduate
Record Examination (general).

General Requirements
Complete 510 and a 600-level research
seminar normally during the fall and spring
semesters of the first year in the graduate
program. Complete 521 in preparation for the
M.A. examination. As many as 9 related
hours may be taken outside the department.
As many as 9 graduate credits taken
elsewhere may be applied toward the M.A.
degree. Except by prior approval of the
Director of Graduate Studies, a student's coursework must be at the 500 level or
above.

Thesis Option
Twenty-four hours of coursework and 6
hours of Thesis 500 for a total of 30 hours
required. Thesis students are required to
select one M.A. field and write a thesis. At
the end of the program the thesis student will
stand for a two-hour oral examination on
both the thesis and the field.

Non-Thesis Option
A total of 30 hours of coursework is
required. At least 6 hours must be completed in
each of two M.A. fields. A student who fails
the two written portion of the oral examination will stand for a two-hour oral
examination with the single grade of pass/fail given at the conclusion of the oral examination. No examination is given on the second
field.

M.A. Fields
United States (colonial to present)
Modern Europe
Asia

Retention and Termination
A 3.0 overall grade-point average is
required to remain in good standing. M.A.
students must take the M.A. examination no
later than the semester following the
completion of 30 hours. A student who fails
the M.A. examination must repeat the
examination no later than the following
semester. A student who fails the examination a second time or does not take the
examination when required will be dropped
from the graduate program.

Doctoral Fields
Group I:
Premodern Europe
Modern Europe
United States (colonial to present)
531 Topics in Premodern Europe (3) Reading seminar: secondary sources on premodern European movements and trends. Focus varies. May be repeated. Maximum 15 hrs.

532 Topics in Modern Europe (3) Reading seminar: secondary sources on movements and trends that are multinational in focus. Focus varies. May be repeated. Maximum 15 hrs.

533 Topics in European National History (3) Reading seminar: secondary sources on intranational topics, usually British, Russian, German or French. Focus varies. May be repeated. Maximum 15 hrs.

541 Topics in Early American History (3) Reading seminar: secondary sources on early North American history. Focus varies. May be repeated. Maximum 15 hrs.

542 Topics in 19th-Century United States (3) Reading seminar: secondary sources on 19th-century United States. Focus varies. May be repeated. Maximum 15 hrs.

543 Topics in 20th-Century United States (3) Reading seminar: secondary sources on 20th-century United States. Focus varies. May be repeated. Maximum 15 hrs.

544 Topics in U.S. Environmental History (3) Reading seminar: secondary sources on U.S. environmental history. Focus varies. May be repeated. Maximum 15 hrs.

551 Topics in the History of Foreign Relations (3) Reading seminar: secondary sources on foreign relations. Focus varies. May be repeated. Maximum 15 hrs.

552 Topics in Military History (3) Reading seminar: secondary sources on military history. Military operations, social impact of war and naval strategy in foreign policy. May be repeated. Maximum 15 hrs.

555 Topics in United States Social and Economic History (3) Reading seminar: secondary sources on U.S. social and economic history. Focus varies. May be repeated. Maximum 15 hrs.

556 Topics in European Social and Economic History (3) Reading seminar: secondary sources on social or economic history of European nations. Focus varies. May be repeated. Maximum 15 hrs.

557 Topics in Cultural and Intellectual History (3) Reading seminar: secondary sources on cultural and intellectual history. Focus varies. May be repeated. Maximum 15 hrs.

558 Topics in United States Regional and Local History (3) Reading seminar: secondary sources on regions, states and cities of the South. Focus varies. May be repeated. Maximum 15 hrs.

561 Topics in Latin American History (3) Reading seminar: secondary sources in Latin America. Focus varies. May be repeated. Maximum 15 hrs.

562 Topics in Asian History (3) Reading seminar: secondary sources on Asian history; East Asia and Middle East. Focus varies. May be repeated. Maximum 15 hrs.

563 Topics in Modern European History (3) Research seminar in primary sources culminating in scholarly paper in modern European history. Focus varies. May be repeated. Maximum 15 hrs.


651 Seminar in Military and Foreign Relations History (3) Research seminar in primary sources culminating in scholarly paper in military or foreign relations history. Focus varies. Not restricted by national grouping. May be repeated. Maximum 15 hrs.

655 Seminar in United States Regional and Local History (3) Research seminar in primary sources culminating in scholarly paper in regional and local history. Focus varies. May be repeated. Maximum 15 hrs.

Human Ecology

(Major: College of Human Ecology)

MAJOR DEGREE

Ph.D.

The College of Human Ecology offers the Doctor of Philosophy degree with a major in Human Ecology.

ADMISSION REQUIREMENTS

A completed file for review includes the Graduate School application file, departmental application, Graduate Record Examination (GRE) scores for the general section, and three Graduate School Rating Forms completed by individuals who can attest to the potential for graduate education. Forms may be obtained from the Dean's Office, College of Human Ecology.

THE DOCTORAL PROGRAM

Graduate study leading to the Doctor of Philosophy degree with a major in Human Ecology is available in the Departments of Child and Family Studies; Consumer and Industry Services Management; Health and Safety Sciences; Human Resource Development; Nutrition. Concentration areas are child and family studies, community health, human resource development, nutrition science, textile science, and retail and consumer sciences. A major challenge of the doctoral program in Human Ecology is to draw upon basic research generated from the natural sciences, social sciences, humanities, and the arts, and to provide a holistic perspective that contributes to the improvement of individual and family well being. Within the College of Human Ecology, research from one discipline is enhanced by encompassing and utilizing the findings of research from other disciplines.

The Ph.D. is a research degree granted only to individuals who demonstrate proficiency in conducting original research. Course requirements for the degree are determined by the student's faculty committee, based upon college and departmental requirements and student needs and interests. The Graduate School sets minimum requirements for the doctoral degree.
MINOR IN GERONTOLOGY

An interdisciplinary minor in gerontology gives the graduate student an opportunity for combining the knowledge and experience about aging in American society with his/her own major concentration. Core courses and a practicum are offered by the College of Social Work and selected departments within the colleges of Human Ecology, Education, and Arts and Sciences. A cross-listed seminar between contributing programs is designed to integrate experiences from different sources and to demonstrate the multi-faceted nature of working within an aging society.

Declaration of a Minor

Prior to earning more than one-half the total hours required for this minor, students must complete a "Declaration of a Minor in the College of Human Ecology" form. Copies of this form are available in the Dean's Office, Room 110, Jessie Harris Building.

Core Experience

Students must complete a core experience of 12 semester hours taken from at least three different departments including nine hours taken from outside the major department. Coursework needs to comply with the following framework:

1. Coursework: 9 hours required. A variety of coursework may be taken toward satisfaction of this requirement. Courses which are offered on a regular basis include: Health 406, 465, Health/Public Health 660, Nutrition 518, Public Health 523, Retail and Consumer Studies 560, Social Work 566, Sociology 415, Psychosocial Education Studies 504, 522, 525, 528.
2. Applied practicum: 2 hours required. Students should register under practicum experiences in the "home" department of the supervising faculty.
4. Successful completion of a written comprehensive examination covering subject matter of the minor.

Graduate Committee

At least one faculty member from the Gerontology Policy Committee who is qualified to work with graduate students, must serve on the graduate committee of each student who declares a gerontology minor. Contact Dr. Jim Moran, Associate Dean in Human Ecology, for a current list.

Admission to Candidacy

When application is made for admission to candidacy, indication of the minor must be noted on the Admission to Candidacy form.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The Ph.D. program in Human Ecology is available to residents of Alabama, Kentucky, Mississippi, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before the degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E
510 Integrative Nature of Home Economics (3) History and philosophy of home economics. Analysis of current programs and future directions in field. Examination of research, integrative framework. F, A
520 Directed Study in Human Ecology (1-3) Integrative topics. Prerequisite: At least 9 hrs of graduate study in college including courses from at least two departments or consent of instructor. May be repeated. Maximum 6 hrs. E
525 Practicum in Human Ecology (1-6) Field based experiences. Prerequisite: Consent of instructor. E
545 Evaluation in Home Economics Education (3) Assessment of programs and pupil progress; techniques, methods and purposes. Prerequisite: Coreq. 540. Coreq. F, Sp, A
574 Analysis of Teaching for Professional Development (2) Strategies to document and analyze effectiveness of teaching and of professional development. Study and application of various approaches. Coreq. 575. F
575 Professional Internship in Teaching (1-8) Intensive teaching and teaching-related experiences in professional settings in public schools. Enrollment limited to postbaccalaureate students in professional year program. Prerequisite: Admission to Teacher Education program. May be repeated. Maximum 12 hrs. S/N only. F, Sp
580 Special Topics in Home Economics Education (3-1) Courses in topics of current interest and trends in home economics. Prerequisite: Consent of instructor. May be repeated. Su, A
581 Directed Study in Home Economics Education (1-3) Prerequisite: Consent of instructor. May be repeated. E
585 Seminar in Gerontology (1) Scope of gerontology as a discipline and as related to other academic and professional disciplines. Speakers both internal and external to UT. Prerequisite: Consent of instructor. May be repeated. Maximum 3 hrs. (Same as Counselor Education and Counseling Psychology 585, Exercise Science 585, Nursing 585, Public Health 585, Psychosocial Education Studies 585, Social Work 585, and Sociology 585.) S/N only.
591 Clinical Studies (1-4) Group and individual seminar activities during full-time internship. Application and evaluation of professional core competencies. Completion and presentation of portfolio and analysis of teaching project. Coreq. 575.
630 College Teaching and Professional Roles in Human Ecology (3) Instructional effectiveness, techniques, organization and evaluation in college teaching. Systems and ecological framework. Professional roles and responsibilities related to higher education programs in human ecology. Sp

Human Resource Development

(College of Human Ecology)

MAJORS DEGREES
Human Ecology ........................................ Ph.D.
Human Resource Development ............... M.S.

Gregory C. Petty, Head

Professors:
Brewer, Ernest W. (Liaison), Ed.D........................................ Tennessee
Campbell, Clifton P., Ed.D.......................... Maryland
Cheek, Gerald D. (Emeritus), Ph.D.......................... Kansas State
Coakley, Carroll B. (Emeritus), Ph.D.......................... Wisconsin
Craig, David G. (Emeritus), Ed.D.............. Cornell
DeJonge, Jacqueline O., Ph.D.,...... Iowa State
Haskell, Roger W. (Emeritus), Ph.D........ Purdue
Mathews, John I. (Emeritus), Ph.D.............. Arizona State
Petty, Gregory C., Ph.D.............................. Missouri
Wagoner, George A. (Emeritus), M.S., Indiana

Assistant Professors:
Stout, Vickie J., Ed.D.............................. Tennessee

The Department of Human Resource Development advances educational opportunities through the integration of occupational education, training, career development, and organizational development. HRD required (core) courses and HRD electives are offered in evening/online/weekend/or semester formats enabling working professionals to obtain the master's or doctoral degree.

THE MASTER'S PROGRAM

The Master of Science degree with a major in Human Resource Development provides a flexible graduate program for professionals wishing to pursue in-depth study within and across subject areas of Human Resource Development; those who work with individuals to help them enter the workforce; those who train individuals already in the workforce; and those who help individuals in the workforce advance their potential.

The M.S. degree with a major in Human Resource Development offers three concentrations, each providing opportunities for specialization: (1) Human Resource Development, (2) Investments in Human Resource Development, and (3) Human Resource Development and Training. Each concentration requires a thesis. The training and development concentration is designed to meet the needs of professionals who work in programs encompassing all areas of human resource development. Applicants without an undergraduate degree in an area related to human resource development may be required to take 501 as a prerequisite and to complete an internship as part of their program. The teacher licensure concentration is specifically for students who seek initial teacher licensure in family and consumer sciences education, business and marketing education, and technology education. This program requires admission to Teacher Education and has specific prerequisites.

Admission Requirements

Training and Development Concentration applicants are to submit an application for admission to The Graduate School, three letters of reference from individuals...
familiar with their potential for success in academic work, and a statement describing personal career objectives directly to the Department of Human Resource Development. Applicants must hold a bachelor's degree from an accredited institution and present evidence of ability to do graduate work, including a GPA of at least 3.0 on a 4.0 scale for the last two years of undergraduate work. Any student below this level of academic quality must justify admission via other exceptional credentials. If the applicant has prior work experience in human resource development, a reference letter should also be provided by the work supervisor. Recent Graduate Record Examination or Miller's Analogies Test scores are required of all applicants except those applying for the teacher licensure concentration. All applicants are required to be interviewed by the department admissions board.

Teacher Licensure Concentration applicants are to submit an application for admission to The Graduate School and are to be admitted to the Teacher Education Program in order to progress in the Professional Education coursework. Admission to the teacher licensure program requires a minimum 2.75 GPA in Technology Education, Business and Marketing Education, Family and Consumer Sciences Education. In addition, applicants are to have a satisfactory student conduct record; a satisfactory speech and hearing evaluation; passing scores on the Pre-Professional Skills Test or an ACT composite score of 21 or an Enhanced ACT composite score of 22 or a SAT combined score of 990; and a satisfactory Admissions Board interview.

Degree Requirements

Training and Development Concentration is a 36-hour thesis program that includes 3 hours of research methodology and 3 hours of statistics. All students must take the departmental core of eighteen hours consisting of 504, 510, 511, 512, 557 and 559. The thesis requires six hours of Thesis (500) and an oral comprehensive examination.

Teacher Licensure Concentration is a 36-hour program that includes 3 hours of research methodology (504) and 3 hours of statistics. The core (9 hours) of the internship program is 521, 522, HE 574 and 591 (1 hour). The internship experience (575) is twelve hours of credit and is the culminating experience. Students choose another 3 hours of coursework to support the teaching field. The thesis requires six hours of Thesis 500 and an oral defense.

THE PH.D. CONCENTRATION

Admission Requirements

Applicants are to submit an application for admission to The Graduate School, five letters of reference from persons familiar with their potential for success in doctoral work, and a statement describing personal career objectives directly to the Department of Human Resource Development. Applicants must hold a master's degree from an accredited institution and present evidence of ability to do Ph.D. work, including having maintained a graduate GPA of 3.3 on a 4.0 scale or better. If the applicant has prior work experience in human resource development, a reference letter should also be provided by the work supervisor. Graduate Record Examination scores are required of all applicants. All applicants are required to be interviewed by the department admissions board.

Any person whose native language is not English must submit results of the Test of English as a Foreign Language (TOEFL). A minimum score of 600 is required for admission consideration.

Degree Requirements

The Doctor of Philosophy degree with a major in Human Ecology and a concentration in human resource development is for graduate students who seek careers in higher education or as managers/administrators of HRD. The curriculum is designed to enable students to achieve professional objectives, develop needed competencies, and gain desirable experiences and understanding of human resource development. Students must possess a master's degree before acceptance to the program. A minimum of 96 hours beyond the baccalaureate is required.

Concentration (12 hours): Must include courses to support Human Resource Development and may be taken from the master's degree.

Departmental Core (27 hours): Must include 510, 511, 512, 557, 559 or equivalents and 12 hours of 604.

Specialization (12 hours): Must support a career path of university faculty member or manager of education/training.

Cognate (6 hours): Must be obtained from an academic unit outside the department, support specialization, and be represented by a committee member.

Research and Statistics (15 hours): Statistics must include advanced statistics such as multivariate analysis and computer application, 6 hours minimum; research method must include 504 and 610 or equivalents, 6 hours minimum.

Internship (0-6 hours): Required for those changing career path.

Dissertation (24 hours): Must be original research and research methodology.

The department offers an alternative approach to residence for the Ph.D. degree. This alternative residence involves, among other requirements, a two-year, continuous enrollment in 604, Research Forum in Human Resource Development. Detailed information regarding the Ph.D. concentration program of study may be obtained from the departmental liaison for graduate studies.

Note: For latest updates, check the homepage of Department of Human Resource Development (http://hrd.hhs.ukr.edu).

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S. program is available to residents of the state of Kentucky. Additional information may be obtained from the Office of Graduate Admissions and Records.

GRADUATE COURSES

415 Coordination Techniques (3) Necessary procedures, duties and responsibilities to implement, maintain and evaluate a successful cooperative education program. Prereq: 210 Microcomputer Applications.

430 Principles and Organizational Behavior (3) Historical background and development of needs. Principles of organizational behavior in business and marketing, curriculum development, establishing, evaluating, and improving programs.

455 Learner and Program Evaluation (3) Assessing effectiveness of training programs; developing performance-based measures; evaluating job performance; and measuring learner progress. Prereq: 210 Microcomputer Applications or equivalent and 320 Program Planning for Training, Development and Education.

476 Supervised Occupational Experience (3) Practical experience in business/industry/community-based settings related to area of study. Prereq: Senior standing and consent of advisor. May be repeated. Maximum 9 hrs. E

500 Thesis (1-15) P/NP only. E

501 Survey of Human Resource Development (3) Training and development as practiced in organizations; needs assessment, transfer of workplace skills, evaluation, development of training programs, personal development, assessment of personal competencies, values, goals, and training program design and administration.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Problems in Lieu of Thesis (3) May be repeated. Maximum 6 hrs. S/NC only. E


505 Selection, Placement, and Follow-up Procedures in Human Resource Development (3) Methods and procedures utilized in establishing criteria for trainee selection and placement in instructional programs. F, Sp

506 Developing Organizational Resources (3) Strategies for developing human and organizational resources through research partnerships and learning. Effective utilization of human resources through active learning programs. Sp

509 Internship in Human Resource Development (3) Practical field experiences in selected settings under supervision of practitioners and departmental representative. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only. E


512 Human Resource Management (3) Processes and systems approach to human resource management: independent human resource activities (planning, work design, staff development, training and development, compensation, etc.) and organizational goals.

513 Special Topics in Human Resource Development (1-3) Specific training or activities and evaluation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

514 Individual Study in Human Resource Development (3) Prereq: Consent of supervising instructor.
Approval form must be filed in office of department head. May be repeated. Maximum 6 hrs. E

515 Microcomputer Operations and Programming (3) Developing and implementing programs using microcomputers and BASIC programming languages for data processing and training applications. Hands-on experience in operating and programming microcomputers, writing, debugging, and running educational programs using sequential data files. Prereq: Teaching, administrative, or related experience in education or training, or consent of instructor.

516 Microcomputer Software Development (3) Advanced software design in BASIC; random access and binary files, search algorithms, and bitmapped graphics for educational environment. Hands-on learning and program development. Prereq: 515 or consent of instructor.

521 Design and Development of Instruction (3) Curriculum development and program planning: design of instruction; development of teaching materials for classroom and educational purposes. Intended for students in family and consumer sciences, business, marketing, technology and industrial education, F.


531 Organization and Supervision of Business and Marketing Education Programs (3) Developing business and marketing education programs. Trends in business and marketing education, physical facilities, state plans, instructor qualifications, and advisory committees. Prereq: Consent of instructor. F.

550 Administration of Industrial Education Programs (3) Developing, staffing, administering, and evaluating trade, industrial and technical education programs in secondary and post-secondary school settings. Prereq: Consent of instructor. Sp, Su.

551 Supervision of Industrial Education Programs (3) Techniques for supervising industrial education programs. Staff development, curriculum improvement, and program updating techniques. Prereq: 455 or equivalent. F, Su.

552 History and Philosophy of Industrial Education (3) Social, political, and economic events that impact development of industrial education. Philosophical problems: justification, values, principles and concepts of industrial education. Prereq: Consent of instructor. F, Su.

553 Planning Technical Education Facilities (3) Preparation of educational specifications, site selection, and working relationships with other professionals involved in the operation of technical education facilities. Prereq: Consent of instructor. Sp, Su.

554 Program Planning (3) Instructional systems attending to analysis, design, development, implementation, and evaluation of technical, supervisory, and related training. Prereq: Curriculum development course and consent of instructor. Sp.


556 Organizational Development (3) Strategies and interventions for organizational development: training and development of staff, models, assessment, organizational change and consultant's role. Prereq: 512 or consent of instructor. F.

557 Methods of Teaching Conceptual Content (3) Proper selection and effective application of methods for teaching and learning conceptual content. Communication strategies for conceptual content comprehension, retention, and application.

558 Seminar in Industrial Education (1-3) Current issues, innovations, problems associated with technical programs. Prereq: 12 hrs of graduate courses. May be repeated. Maximum 6 hrs.

559 Program Evaluation (3) Concepts, principles, practices, theories, and trends related to program evaluation. Planning, organizing, and carrying out program evaluation in a variety of settings. Fundamentals of design, measurement, return-on-investment (ROI), and presentation and dissemination of results to stakeholders.

560 International Perspective of Workforce Training (3) Examination and comparison of workforce training systems in highly industrialized countries. In-school training programs, out-of-school training programs, up-to-date training of incumbent workers, retraining displaced workers, transfer of technology, and role and responsibilities of businesses, private sector organizations/agencies, and state and federal government agencies.

562 Grant Writing and Project Implementation (3) Writing grant proposals, negotiating with funding sources, implementing funded programs, and closing out projects at end of funding support.

564 Self-Directed Work Teams (3) Theory and practice of implementing self-directed work teams, motivating employees, increasing employee productivity via teams and related issues.

600 Doctoral Research and Dissertation (3-15) P/N only. E

601 Curriculum Planning in Human Resource Development (3) Curriculum theory, modes, contents, planning, evaluation and implementation of specialized program areas. Prereq: 555 or equivalent.

604 Research Forum in Human Resource Development (2) Development of theoretical framework, research design, evaluation techniques and qualitative and quantitative strategies for investigations of problems and issues in human resource development. Initial enrollment Fall only. Continuous enrollment required for Ph.D. May be repeated. Maximum 12 hrs. S/Nc only. E

610 Research Development in Human Resource Development (3) Proposal development, theoretical base, research design, sampling, application of statistics, and evaluation of research in human resource development. Prereq: 6 hrs of advanced statistics courses and consent of instructor.

611 Internship in Human Resource Development (3) Field experience in relevant organizations. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs. E

613 Special Topics in Human Resource Development (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

Industrial and Organizational Psychology

(College of Business Administration)

MAJOR

DEGREES

Industrial and Organizational Psychology ........................................... Ph.D.

Robert T. Ladd (Liaison), Director

Committee:

Fowler, Oscar S., Management
James, Lawrence R., Management
Larson, John M., Jr. (Emeritus), Management
Rentsch, Joan R., Management
Russ, Michael C., Management
Schumann, David W., Marketing, Logistics & Transportation
Woeber, David J., Marketing

The doctoral program is designed to prepare students for personnel, managerial, and organizational research, for university teaching; and for consulting relationships with industry. The program emphasizes a scientist/practitioner model in applying and conducting research based on accepted theory, organizational behavior, psychology, management, and statistics. The degree program is administered by a committee appointed by the Dean of The Graduate School on recommendations from the Management Department head and the program director.

It is intended that students entering the I/O program will represent widely different undergraduate and graduate backgrounds including psychology, business administration, engineering, science, and liberal arts. The first-year program provides the opportunity to take courses that will assist the students in attaining a reasonable level of sophistication in areas of deficiency.

ADMISSION REQUIREMENTS

Applicants for admission should request information and application forms from both the Office of Graduate Admissions and the Records (218 Student Services Building) and the Director, Industrial and Organizational Psychology Program, (408 Stokely Management Center, The University of Tennessee, Knoxville, TN 37996-0545).

Two separate applications must be completed: one application for admission to the Graduate School (apply for major in Industrial and Organizational Psychology) and one application for admission to the Industrial and Organizational Psychology program. Deadline: New students are admitted in fall semester only, and applications must be received by the Graduate Admissions and Records Office by February 1.

The master's degree in Industrial and Organizational Psychology is generally not required of individuals pursuing a doctoral degree.

General Requirements

At least one year of college mathematics and one course in statistics are required. Ordinarily, an undergraduate grade-point average of 3.7 or above is required, with no evidence of special weakness in mathematics and physical sciences.

Test scores on each section of the general portion (verbal and quantitative) of the Graduate Record Examination (GRE) are required. Customarily, those students admitted to the program have performed at or above the 69-79th percentile on the general tests. (This corresponds to a raw score of approximately 600 on each of the tests.)

THE DOCTORAL PROGRAM

The Ph.D. degree with a major in Industrial and Organizational Psychology can be completed with a minimum of 30 semester hours in the major. Students must be in residence full-time for one year; must maintain an overall 3.0 grade-point average with no more than one grade below B in the I/O Psychology, General Psychology, and Statistics core; must complete an applied research project prior to beginning dissertation work; must pass a comprehensive examination; and must pass a final oral examination on their dissertation research.
Course Requirements:

I/O Psychology Core
567, 568 & 569

Research Core
12

Statistical Principles (Statistics 537 & 538 or equivalents)
Multivariate Statistics (Statistics 579, 679 or equivalent)
Advanced Research Methods (605 or equivalent)

General Psychology Core
9

One course in each of the following areas:
- Behavioral bases of behavior,
- Cognitive bases of behavior,
- History and systems of psychology.

I/O Psychology Seminars
9

600 level I/O/Psy courses, from a program committee approved list.

General Psychology Core
9

One course in each of the following areas: work motivation. Prereq: 567-68 or consent of instructor.

613 Seminar in Performance Appraisal (3) Current issues, problems, and research in performance appraisal and criterion development; applications in compensation. Prereq: 567-68 or consent of instructor.

614 Seminar in Employee Selection (3) Current issues, concerns, and methods used in employee selection. Prereq: 567-68 or consent of instructor.

615 Seminar in Organizational Training and Development (3) Current issues, problems, and research in training and development. Prereq: 567-68 or consent of instructor.

625 Topics in Organizational Psychology (3) Topics vary. May be repeated. Maximum 9 hrs.

626 Topics in Industrial Psychology (3) Topics vary. May be repeated. Maximum 9 hrs.

627 Structural Equation Models in Organizational Research (3) Issues related to analysis of organizational data using structural equation and related techniques.

628 Personality Assessment (3) Review of key domains of social cognition: measurement systems which use individual differences in social-cognitive biases as basis for measuring personality.

635 Ethical and Professional Issues in Industrial/Organizational Psychology (3) Issues involved with ethical practice in research, academic, organizational, and consulting situations.

690 Supervised Practicum, Internship or Field Training in Industrial/Organizational Psychology (1-15) One credit hour per 30 hours of practice. S/NC or letter grade.

American Common Market

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The Ph.D. program is available to residents of Alabama, Kentucky, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Graduate Courses

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when the student uses University facilities and/or faculty time before degree is complete. May not be used toward degree requirements. May be repeated. S/NC only. E

525 Research in Industrial/Organizational Psychology (1-3) Available only to students admitted to program or by permission of program director. May be repeated. Maximum 9 hrs. S/NC or letter grade.

567-68 Proseminar in Industrial/Organizational Psychology (3,3) Basic thought, concepts, and issues required for advanced study in industrial and organizational psychology. Must be taken during first year of study in program. Consent of instructor required for non-program students.

569 Applied Measurement for Industrial/Organizational Psychology (3) Basic techniques for collection and evaluation of individual and organizational data using both classical and modern psychometric techniques. Relevant statistical models: reliability analysis, and exploratory and confirmatory factor analyses.

600 Doctoral Research and Dissertation (3-15) P/ NP only. E

605 Advanced Research Methods in Psychology (3) Critical analysis of new and evolving techniques for psychological research; new statistical and psychometric methods.

610 Individuals in Organizations Seminar (3) Bridging principles and processes which link individual attributes with macro organizational concerns; culture, climate, and group decision-making.

611 Seminar in Organizational Leadership (3) Current theories, concepts, and issues associated with psychology of organizational leadership. Prereq: 567-68 or consent of instructor.

612 Seminar in Work Motivation (3) Current theories, concepts, and issues associated with psychology of traditional industrial engineering, engineering management, and manufacturing systems engineering. The Ph.D. with a major in Engineering Science is available through the Department of Mechanical and Aerospace Engineering and Engineering Science with a concentration in industrial engineering.

The Master's Program

Students who enroll in the Master of Science degree may select a concentration in industrial engineering, engineering management, or manufacturing systems engineering. Admission is open to graduates of ABET-accredited undergraduate curricula in engineering, or to graduates of other technical curricula who satisfy prerequisites depending on their academic backgrounds. Policies concerning prerequisite requirements will be determined by the industrial Engineering faculty.

Industrial Engineering

Under the industrial engineering concentration, students may select either the thesis or non-thesis option. The thesis option requires 27 hours of coursework and 6 hours thesis. The non-thesis option requires 30 hours of coursework plus a 3-hour design project. Depending upon a student's background and career objectives, graduate work in industrial engineering enables the student to select an area of specialization from operations research, human factors engineering, information systems engineering, maintenance and reliability engineering, or general industrial engineering.

Engineering Management

The engineering management concentration has an additional admission requirement of two years' U.S. industrial experience as a practicing engineer or scientist, or current full-time employment in an appropriate engineering or applied science position. The program is non-thesis and requires 33 hours of coursework plus a 3-hour capstone project. This concentration is fully supported off-campus utilizing electronic media for video taping and interactive distance teaching methods.

Manufacturing Systems Engineering

Under the manufacturing systems engineering concentration, students may select either the thesis or non-thesis option when taking the M.S. degree program, or the non-thesis option only when taking the dual M.S.-MBA program. The thesis option requires 27 hours of coursework and 6 hours of thesis. The non-thesis option requires 30 hours of coursework plus a 3-hour design or industrial problem project (36 hours in the dual M.S.-MBA program).

Dual M.S.-MBA Program

The College of Engineering and the College of Business Administration offer a coordinated program leading to the conferral of the Master of Science degree with a major in Industrial Engineering (concentration in manufacturing systems engineering) and the Master of Business Administration degree (concentration in manufacturing management). The dual program saves the student...
one or two semesters over the time that would be required to earn both degrees independently.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate this increasingly complex body of knowledge in achieving the efficient operation of manufacturing and production firms. The program is designed to accommodate the interests of students who desire a career leading to a leadership position in a manufacturing/production organization.

Admission Requirements

Applications are accepted for fall semester only. Applicants for the M.S.-MBA program must make separate application to, and be competitively and independently accepted by, The Graduate School for the Master of Business Administration degree program and The Master of Science degree program with a major in Industrial Engineering, and by the Dual Program Committee. Students will initially apply for the MBA program, indicating on that application the intent to pursue the dual M.S.-MBA program in manufacturing (refer to the MBA program for separate instructions). Students accepted for both degree programs will be assigned by the Dual Program Committee advisors who will be responsible for supervision of the student's progress through the dual program.

Applications by U.S. citizens and permanent residents received after the MBA application deadline (March 1) will be considered as space allows. Additional information is required, and different application dates are established by The Graduate School for international students.

Curriculum

The curriculum in the first academic year of the dual M.S.-MBA program is the two-semester core of the MBA program (two 15-hour courses each semester). In addition to the MBA core, three credit hours of a survey course in manufacturing systems engineering (IE 503) will also be taken during the first year (1 hour Fall semester and 2 hours Spring semester). A summer internship in industry will be accomplished between the two academic years.

During the second year, 27 hours of coursework will be completed in the manufacturing systems engineering concentration in Industrial Engineering plus an additional two graduate courses in the College of Business Administration acceptable in meeting the requirements of the MBA program. Fifteen hours will be taken during each of the first two semesters of the second academic year. A culminating 6-hour integrated case study requiring use of most previous material taken in the dual program as required by the Dual Program Committee, will be taken during the first session of summer term of the second year.

The dual degree candidate must satisfy the curriculum and graduation requirements of the Department of Industrial Engineering and the College of Business Administration. Dual degree students withdrawing from the dual program before completion of both degrees will not receive credit toward graduation in either degree program for courses in the other degree program, except as such courses qualify for credit without regard to the dual degree program. The M.S. and the MBA degrees will be awarded upon successful completion of the requirements of the dual program.

Approved Dual Credit

A maximum of 6 semester hours of approved graduate-level courses completed in the College of Business Administration may be counted toward the M.S. degree program with a major in Industrial Engineering. A maximum of 15 semester hours of approved graduate-level courses completed in the Department of Industrial Engineering may be counted toward the MBA degree program. The approval of courses is the responsibility of the Dual Program Committee and the student's assigned advisor.

Note: Any 400-level course required in the Bachelor of Science in Industrial Engineering program at UT may not be used for graduate credit in the M.S. degree program.

Industrial Engineering

GRADUATE COURSES

401 Integrated Manufacturing Systems (3) NC and CNC machine tools, robotics and related materials handling systems, hard automation, alternative integrated manufacturing systems, and manufacturing information systems. Prerequisite: 330 Manufacturing Materials/Processes. F

402 Production System Planning and Control (3) Theory and application of forecasting systems, regression and time series models. Independent demand inventory models, development of safety stock. Coverage of all modules of Manufacturing Resource Planning (MRP) Systems: master production scheduling, resource requirements planning, bill of material and inventory file structure, material requirements planning, capacity planning, shop floor and purchase order control. Prerequisite: 306 Simulation, Coreq: 401. F

403 Production Facilities Design and Material Handling (3) Design of production facilities: plant layout, analysis and planning for overall moving, packaging and storage of materials. Office layout and service areas. Design of facilities for such diverse groups as hospitals, banking, industry. Prerequisite: 306 Simulation, Coreq: 401. F

405 Engineering Economic Analysis (3) Engineering economy and application in engineering practice. Time value of money and discounted cash flow techniques. Decisions among engineering alternatives: design options, equipment selection, break-even points, and similar situations. Cost estimating and consideration of taxes and inflation. Analyzing uncertainty in economic estimates using nonprobabilistic techniques. Prerequisite: Jr. standing or consent of instructor. E

421 Information Systems Analysis and Design (3) Systems engineering approach to analysis, design, development, and implementation of systems of information. Informational requirements of industrial engineering systems. Utilization of relevant software packages. Prerequisite: Senior standing or consent of instructor. E

422 Senior Industrial Engineering Problems Analysis (3) Application of industrial engineering to field assignments in local organizations, problem definition, work measurement, alternative analysis. Prerequisite: Expected term of graduation or consent of instructor. E


440 Process Improvement Through Planned Experimentation (3) Fundamentals of continuous improvement, advanced statistical process control techniques, and strategies for short production runs. Use of experimental design techniques to improve processes; single and multiple-factor designs, blocking and confounding, and fractional designs. Full factorial designs compared to fractional designs to balance experimental efficiency with loss of information. Lab component utilizes statistical and simulation software to promote skills in experimental design, Data Analysis and Process Improvement. Sp

484 Introduction to Maintenance Engineering (3) (Same as Nuclear Engineering 484, Materials Science and Engineering 484, and Mechanical Engineering 484.) Sp

500 Thesis (1-15) P/NP only. E

501 Design Project (1-3) Enrollment limited to industrial engineering students in non-thesis program. May be repeated. Maximum 6 hrs. P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. Maximum 3 hrs.

512 Facilities Planning and Design (3) Modern materials handling techniques, computer-aided layout techniques, application of operation research models, and use of these to design manufacturing facilities. Prerequisite: Production Facilities Design and Material Handling or consent of instructor.

514 Advanced Information Systems Analysis and Design (3) Systems analysis and systems control concepts applied to systems of information. Role of IE in office and factory of future. Management support systems, decision support systems, and integrated support systems.

515 Advanced Production and Inventory Systems (3) Advanced topics in production planning and inventory systems. Material requirements planning; production planning and master scheduling; just-in-time concepts; production requirements planning; and other related topics. Prerequisite: 402 or consent of instructor.

516 Statistical Methods in Industrial Engineering (3) Application of classical statistical techniques to industrial engineering problems. Statistics and statistical thinking in managerial context of organizational improvement: descriptive statistics and distribution theory; relationship between statistical process control techniques and classical statistical tools; parameter estimation and hypothesis testing; goodness-of-fit testing; linear regression and correlation; analysis of variance; single and multiple factor experimental design. Prerequisite: Probability and Statistics for Scientists and Engineers, or equivalent.

517 Reliability Engineering (3) Continuous time random processes with applications to availability of equipment and manufacturing systems. Failure densities and failure data analysis. Maintainability. Reliability-based criteria for product acceptance. Prerequisite: 516.

518 Advanced Engineering Economic Analysis (3) Application of engineering economic analysis to complex decisions situations. Inflation and price changes; uncertainty evaluation using nonprobabilistic techniques; financing methods; forecasting and project evaluation involving equipment replacement, investor-owed utilities, and public works projects; probabilistic risk analysis; and computer simulation and decision trees, multi-attributed decision analysis, and other related topics. Prerequisite: 405 and Probability and Statistics for Scientists and Engineers, or equivalent.
519 Human Factors Engineering and Ergonomics (3) Application of human factor and ergonomic concepts and principles to design and analysis of industrial systems and products. Human as biomechanical system; human interaction and communication; optimization of human error; anthropometry; anatomy and physiology; physical and mental workload; effects of environmental factors; human factors in stress, fatigue, and performance. May be repeated with consent of instructor.

602 Nonlinear Optimization (3) Classical optimization applied to constrained and unconstrained, non-linear, multi-variable functions; search techniques; decision making under uncertainty; game theory; and modern optimization programming. Prereq: Operations Research or Engineering Management 537.

521 Advanced Human Factors Engineering Methodology (3) Advanced methodologies used in human factors engineering. Observational methods; function/task analysis; computerized human factors design methods; human reliability and error prediction; evaluation of human factors in maintenance, repair, and installation. Prereq: 519 or consent of instructor.

522 Optimization Methods in Industrial Engineering (3) Classical optimization applied to constrained and unconstrained, non-linear, multi-variable functions; search techniques; decision making under uncertainty; game theory; and modern optimization programming. Prereq: 519 or consent of instructor.

601 Operations Research Models in Engineering Economy (3) Management optimization techniques applied to capital budgeting; advanced topics in multiple attribute decision analysis. Bayesian analysis of sequential decision making and artificial intelligence in complex decision analyses. Prereq: 519 or 523.


606 Advanced Topics in Human Factors, Safety and Biomechanical Engineering (3) Application of advanced engineering analysis and design methods to industrial systems, safety, epidemiology of accidents and injuries, and study of injury causal mechanisms. Injury models; development of injury standards, exposure assessment, and risk reduction techniques. Current research issues in manned systems analysis and design. Research into system failure, prevention of injuries. Prereq: Consent of instructor.

691-92-93 Advanced Topics in Industrial Engineering (3,3,3) Forum to study individually or in groups. Prereq: Graduate standing and consent of instructor. May be repeated with consent of instructor.

559 Strategic Management in Technical Organizations (3) Strategic planning process and strategic management in practice; corporate vision and mission; product, market, organization, and financial strategies; external factors: commercialization of new technologies, and competition and beyond. Prereq: 533 and Industrial Engineering 601 or consent of instructor.


541 Total Quality Management and Beyond (3) Total quality management in organizations. Principles of total quality management; system theory and analysis; systems thinking; problem and decision making; and application of statistical techniques in continuous improvement. Team building and leadership issues, and case studies. Prereq: 516.


543 Legal and Ethical Aspects of Engineering Management (3) Legal aspects imposed by government and ethical considerations in engineering practice. Selected readings, lecture, discussion, and student presentations. Current topics from government and industry.
A personal data sheet and three recommendations (obtained from the School of Information Sciences) should be returned to the admissions office of the school. Foreign applicants are required to take the Test of English as a Foreign Language.

**THE MASTER'S DEGREE**

The program leading to the Master of Science involves a total of 42 semester hours of graduate courses, 15 hours of which form a core curriculum required of all students. Either a thesis or a non-thesis option is available, with 6 hours required for thesis credit. At least 36 hours must be taken in the School of Information Sciences, allowing up to 6 hours outside the school with a maximum of 6 from outside the University.

**Core Curriculum**

The core curriculum is a 15 semester hour sequence of five courses required of all students: 490, 520, 530, 560, 580. These courses address solvers the evolving information environment; foundations of information sciences and technologies; information resources selection, acquisition and evaluation; information content representation; information access and retrieval. The 15-hour core is prerequisite to all elective courses for students enrolled in the MS degree program. Elective courses may begin in the final semester of core course work with permission of the advisor and the instructor of each elective course selected.

**Individualized Curriculum Approach**

Students, in consultation with their advisor, may wish to pursue a curricular focus to develop an individualized program of study. Graduates of the school have prepared themselves for a variety of careers, including positions as: corporate information specialist, public librarian, records specialist, database designer, indexer/abstractor, online information retrieval specialist, medical or law librarian, reference librarian, youth services specialist, and many others. Once the core courses have been completed, students are encouraged to take advantage of the individualized curricular approach.

Whatever individualized curriculum is chosen, all students who complete the program receive an M.S. degree accredited by the American Library Association (ALA).

For those pursuing Tennessee Department of Education licensure as a school library information specialist, stipulated requirements apply. See following section.

**Tennessee State Department of Education School Library Information Specialist Requirements**

The Tennessee State Department of Education requires School Library Information Specialists to hold the master's degree. The School of Information Sciences offers four tracks for School Library Information specialist endorsement.

**Initial Endorsement for Non-Licensed Teachers with a Master's Degree in Library or Information Sciences**

For those students who do not hold the master's degree, the requirements for initial endorsement include the 15-hour core plus 551, 567, 571, 572, 573, 585, and 595. In addition, students must complete two corequisite courses from the College of Education (5 credit hours) which do not count toward the master's degree requirements. Students pursuing the initial endorsement must follow the non-thesis option. Upon completion of the requirements, students will earn a master's degree in Information Sciences and a Tennessee State Department of Education license as a School Library Information Specialist.

**Additional Endorsement for Licensed Teachers with a Master's Degree**

The requirements include the 15-hour core plus 551, 567, 571, 572, 585, and 595 (which must be taken twice). Upon completion of the requirements, students will earn a Tennessee State Department of Education additional endorsement as a School Library Information Specialist.

**Additional Endorsement for Licensed Teachers without a Master's Degree**

The requirements include the 15-hour core plus 551, 567, 571, 572, 585, and 596 (which must be taken twice) plus 3 electives (upon approval of the faculty advisor). Upon completion of the requirements, students will earn a master's degree in Information Sciences and a Tennessee State Department of Education additional endorsement as a School Library Information Specialist.

**Additional Program Requirements**

**Thesis Option:** Students electing the thesis option will write a master's thesis under close supervision of a thesis committee. Six hours of Thesis (IS 500) must be taken within the 42 hours required for graduation. Students may register for more than 6 hours of 500, but only 6 hours will count toward graduation. Students must be registered for IS 500 in the semester they complete and defend their thesis. The oral defense of the thesis (final comprehensive examination) substitutes for the thesis (written examination) that is taken by non-thesis students. The writing of the master's thesis serves as the culminating experience.

**Non-Thesis Option:** Upon completion of the program, all students who elect the non-thesis option must take and pass a written comprehensive examination. A culminating experience is also required which must be completed in one of the student's last two terms with a grade of B or better (except as noted) selected from the following and approved by the student's advisor:

- 560 Problems in Information Science
- 591 Supervised Readings in Information Sciences
- 592 Seminar in Information Sciences
- 593 Independent Study
- 594 Graduate
FINANCIAL ASSISTANCE OPPORTUNITIES

Employment with the University of Tennessee Libraries may provide a work-study opportunity for selected students who wish to obtain experience in academic librarianship while pursuing the degree. Such students usually work at least 20 hours each week and thus may extend the period required for the degree. Similar opportunities exist with other libraries and information agencies in the Knoxville area.

Work opportunities in a scientific-technical environment are available through subcontracts with Oak Ridge National Laboratory and the Department of Energy.

A limited number of graduate teaching assistantships are available through the school. Assistantships of this type carry a waiver of tuition fees as well as a stipend and require that recipients work 10 hours per week in the school.

For application forms and information about financial aid and other information about the M.S. in Information Sciences, write to Admissions, School of Information Sciences, University of Tennessee, 804 Volunteer Blvd., Knoxville, TN 37996-4330.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S. program in Information Sciences is available to residents of the states of Arkansas, Georgia, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

430 History of the Book (3) History of writing and various methods of bookmaking.

450 Writing About Science, Technology and Medicine (3) (Same as Journalism 450.)

486 Advanced Informational and Information Resources on the Internet (3) Exploration of worldwide information and communications resources: email, newsgroups, and World Wide Web. Discussion of information issues: copyright, censorship, privacy, and access.

496 Advanced Electronic Communications and Information Resources on the Internet (3) Exploration of advanced information and communications issues, including networking, ethics, issues of access, and the Internet. Prereq: 495 or consent of instructor.

490 Information Environment (3) Generation, production, management, dissemination, and use of information. Roles of information in society, information seeking and information industry, economics of information products and services, technological and organizational change, information professions, and issues. E.A.

500 Thesis (1-15) P/NP only. E

502 Registration and Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E


521 Cataloging and Classification (3) Basic library-oriented cataloging and classification techniques, tools, and supporting operations. Descriptive cataloging, choice and form of non-subject entries, subject heading, work, general classification, authority control. Bibliographic utilities, online library catalogs.

522 Organization and Representation of Multimedia Information Resources (3) Principles and practices of accessing and organizing information resources in nonprint media such as audiovisual, visual, and electronic (including Internet) resources.

523 Abstracting and Indexing (3) Philosophies, standards, and procedures for manual and automatic indexing. Tools, vocabulary control, thesaurus construction, and abstracting.

530 Information Access and Retrieval (3) Media for information storage, logical and physical information structures, query logic and languages, search strategies and heuristics, user interfaces, evaluation of retrieval system performance. Search techniques for various types of databases including multi-media, full-text, numeric, bibliographic, E.A.

531 Sources and Services for the Social Sciences (3) Information sources in political science, sociology, psychology, geography, history, anthropology, business, and education.

532 Sources and Services for Science and Engineering (3) Information sources in engineering, physical and life sciences.

533 Sources and Services for the Humanities (3) Information sources in philosophy, religion, fine arts, performing arts, literature, music, language. Organization and management of regional collections.

534 Government Information Sources (3) Selection, acquisition, organization, and utilization of government information in various formats from legislative, judicial, and executive branch of the federal, state, local, and international government and intergovernmental agencies. F.

535 Advanced Information Retrieval (3) Bibliographic, non-bibliographic, full-text databases, e.g., non-bibliographic formula and structure databases, contents-page/full-text databases, patents; document delivery alternatives, evaluation, and testing. Sp.

536 Information Industry (3) Issues and trends concerning information industry: products and services, technological changes, choice of distribution media, entrepreneurial opportunities. Legal, ethical, and quality concerns. F.

537 Economics of Information (3) Costing and pricing of information: value of information and value added services, cost-benefit analysis and tradeoffs; policy issues related to economic aspects of information exchange and transfer.

539 Information Policy (3) Role of government in creation, exchange, and distribution of information; role of market forces, government agencies, international standards and treaties, and international and regional policy agreements. Sp.

540 Research Methods (3) Research methods in the field of Information Sciences, including research design, research results interpretation, analysis of published research, and evaluation of published research. E.

541 School Library Media Centers (3) Planning, implementation, and evaluation of school libraries. Librarian role and responsibilities. E.

542 Information Sciences (3) Definitions, information, informa-
tion, sciences, and information technology; theories of information, information representation, retrieval, and transfer; standards and technologies for information processing and distribution; research front, bibliometrics and informetrics; relationships with other disciplines. E,A

581 Seminar in Radio and Television (3) (Same as Broadcasting 580.)

582 Library Automation (3) Computer-based applications and systems for libraries including MARC, bibliographic utilities, retrospective conversion, circulation systems, online public access catalog (OPAC), and database management systems. Minimum 3.0 cumulative GPA. Written consent for improvement of instruction through use of media. E

583 Information Systems (3) Systems concept, design, analysis, and design of information systems. Selection and implementation of computer systems to support various activities. User involvement in the development process. F,Sp

584 Database Management Systems (3) Defining data needs, data structures, roles of operating systems in data management, file organization, database management systems, logical data models, internal data models, database administration and evaluation. Design and implementation of application using database management system. Sp

585 Information Retrieval Systems (3) Historical perspective on information retrieval research; statistical and probabilistic retrieval techniques; cognitive and or user modeling; expert intermediary systems; associations, relations and hyper-links.

586 Human-Computer Interaction (3) Survey of human-computer interaction and introduction to human and technological factors of importance to design of usable information systems. Basic phenomena of human perception, cognition, memory, and problem solving, and relationship to user-centered design. Methods and techniques for interaction design and evaluation. Sp

589 Information Networking Technologies (3) Concepts and terminology of information transmission, network architecture and standards. Contemporary and emerging information networking technologies. F

590 Problems in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

591 Supervised Readings in Information Sciences (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F,Sp

592 Seminar in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated with consent of advisor. Maximum 6 hrs.

593 Independent Study (3-6) Prerequisite: Consent of advisor. Maximum 6 hrs. F,Sp

594 Graduate Research Participation (3) Advanced research techniques under supervision of staff research director whose area coincides with interests of student. Prereq: Consent of advisor and research director. S/N only. F,Sp

595 Student Teaching in School Library Information Center (9) Planned professional semester: full day school library work and classroom observation activities. S/N only.

596 Student Teaching and Observation in School Library Information Centers (2) Prescribed activi- ties to gain competencies in a school library informa- tion center setting. Must be taken twice. May be repeated. Maximum 6 hrs. S/N only.

599 Practicum (3-6) Opportunity to translate theory into practice under guidance of qualified information professionals. Prereq: Completion of core and pertinent advanced courses relevant to student's practicum design. Minimum 3.0 cumulative GPA. Written consent of advisor and approval of practicum coordinator. May be repeated. Maximum 6 hours. S/N only. E

501 Advanced Seminar in Information Sciences (3) Theories, research, and traditional practices of informa- tion representation, organization, and access and retrieval. Research opportunities and methods. Relationship to and interaction with other disciplines.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or facility time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E


518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Techniques of Research in Education (3) Study and application. F

521 Computer Applications in Classroom (3) Computer applications and peripheries in school and classroom. Prereq: Computer and Informational Design, Applications of Informational Technology in Elementary and Middle School Teaching, or Introduction to Informational Computing. E

532 Instructional Research: Analysis and Application (3) Analysis of research on instruction. Translation and application of research findings into instructional performance.

533 Program Evaluation in Education (3) Issues and practices in planning and conducting program and curriculum evaluation in variety of settings. Fundamentals of educational statistics, models for decision making, and evaluation in educational organizations. Prereq: Consent of instructor. (Same as Higher Education 534.) Sp,Su


552 School Law for Educators (3) Case and statutory material for public school educators. Problems concerning law and public education.

557 The Junior High and Middle School Curriculum (3) Curriculum and instructional design for junior high and middle school. Characteristics of students, curriculum design, instructional patterns, and organization and structure of junior high and middle school.

558 Curriculum Planning and Development (3) Foundations and principles of curriculum planning and development. Historical analysis of curriculum theory, principles of planning and development, and classroom applications for improved learning. E

560 Student Assessment (3) Processes for assessing and reporting student progress; interpretation of available assessment data; methods of setting criteria for assessment other than tests and measurements: portfolios, performance tasks, exhibitions. F

561 Educational Statistics (3) Applications of descriptive and inferential statistics to educational and institutional problems. Use of electronic calculators in educational research. Prereq: One year of college mathematics, an elementary course in statistics, or consent of instructor. E

566 Administering Instructional Media Programs (3) Leadership roles and responsibilities of professional media administrator in various organizational settings.

569 Advanced Production of Audiovisual Software (3) Hand and mechanical lettering, flat picture mounting, overhead projection, audio production, TV studio orientation, sync-taping, multi-screen presentations, and printing techniques. (Same as Information Sciences 569.)

571 Desktop Publishing for Educators (3) Use of computer-based desktop publishing and graphics software and related hardware in designing and producing instructional and informational products.

573 Designing and Producing Interactive Multimedia (3) Selected multimedia authoring tools to design and produce interactive instructional materials based on specified learner characteristics and objectives: Internet and stand-alone applications.

575 The Internet: Implications for Teaching and Learning (3) Projects and survey theories for using the Internet as information, research, and instructional tool. Variety of browsers, search engines, and web page construction software.

577 Introduction To Data Processing In Curricu- lum and Instruction (4) Analysis of current activities in educational computing and data processing. Curricu- lar, instructional, research, and classroom manage-
ment applications from microcomputers to supercomputers. Prereq: Consent of instructor.

580 Techniques for Research in Curriculum and Instruction (3) Fundamentals of research methodology applicable to curriculum, instruction, and evaluation. Critical reading of research and development of skills needed for proposal development. E

588 Instructional Theory and Design (3) Relationship of curriculum to instruction: examination of instructional and related learning theories; instructional models and teaching styles. F, Su

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

594 Supervised Readings (1-3) May be repeated. S/NC or letter grade. E

595 Special Topics (1-3) May be repeated. S/NC or letter grade. E

600 Doctoral Research and Dissertation (3-15) P/NC only. E

604 Seminar in Curriculum and Instruction (1) Required 2 consecutive semesters. S/NC only. E

623 Using Research for Curriculum Improvement (3) Research methodology; application to descriptive/survey curriculum materials. Critical reading of research, methodological development, and survey areas. Sp

630 Seminar in Assessment and Evaluation (3) Trends and issues in student/client assessment, personnel evaluation, and program evaluation; examination of current state, regional, and national assessment and evaluation projects. Prereq: Consent of instructor.

631 Application of Assessment/Evaluation (3) Systems design, instruments, procedures, reporting formats used in personnel and program evaluation and student assessment; analysis, synthesis and interpretation of data sets. Prereq: 630.

669 Instructional Media Research (3) Identification, location, and collection of developmental and experimental research on instructional media. Application of research.

671 Advanced Educational Statistics (3) Applications of parametric and non-parametric statistical inference to educational and instructional problems. Use of microcomputers in educational research. Prereq: 561. F, Sp

672 Interpretation and Application of Curriculum and Instruction Research (3) Analysis of research in curriculum and instruction, newer methodologies and strategies. Utilization of research to improve curriculum and instruction practice, application of research principles in context of specific professional assignments. Prereq: Consent of instructor.

674 Designing and Implementing Personnel (3) Models and methods for assessing performance of educators and other professionals. Critique of systems currently in use and design of evaluation system.

675 Curriculum Evaluation: Theory and Application (3) Evaluation trends and issues. Theoretical frameworks to design evaluation studies for various educational programs.

676 Curriculum Theory (3) Influential curriculum theories and approaches, implications for structure and design of educational programs. Nature and function of theory, theory building activities. Prereq: 553.

677 Instructional Systems Design (3) Educational theory and research concerning design, development and evaluation of instructional products based on specified goals, objectives, and audience characteristics.

678 Seminar in Instructional Technology (1-3) Readings and discussions based on current literature, research, and practices in instructional technology.


689 Internship (1-3) Experiences in application of principles and practices of curriculum development and instructional improvement. Prereq: Program prerequisites and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

694 Supervised Reading (1-3) May be repeated. S/NC or letter grade. E

695 Special Topics (1-3) May be repeated. S/NC or letter grade. E

Interdisciplinary Programs

(College of Arts and Sciences)

The College of Arts and Sciences offers a series of interdisciplinary undergraduate majors and minors through its Interdisciplinary Programs. These programs include African and African-American Studies, American Studies, Ancient Mediterranean Civilizations, Asian Studies, Cinema Studies, Comparative Literature, Environmental Studies, Latin American Studies, Legal Studies, Judaic Studies, Linguistics, Medieval Studies, Urban Studies and Women's Studies. Certain courses within these programs are available for graduate credit as listed below. See the Undergraduate Catalog for program descriptions and directors.

African and African-American Studies

GRADUATE COURSES


450 Issues and Topics in African-American Studies (3) Problems, topics, issues, and individuals. May be repeated. Maximum 6 hrs.

452 Black African Politics (3) (Same as Political Science 452)

473 Black Male in American Society (3) Development of historical images, myths and stereotypes, impact of critical factors: Black feminism, violence, concepts of masculinity, family, white males, white females, homosexuality, nationalism, and athletics.

483 African-American Women in American Society (3) Historical and contemporary socio-political factors in American society as related to Black women. (Same as Women's Studies 483.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

American Studies

GRADUATE COURSES

423 Geography of American Popular Culture (3) (Same as Geography 423.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Ancient Mediterranean Civilizations

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Asian Studies

GRADUATE COURSES

471 Selected Topics in Asian Studies (3) Content varies. May be repeated. Maximum 6 hrs.

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Cinema Studies

GRADUATE COURSES

400 Special Topics (3) May be repeated. Maximum 6 hrs.

420 French Cinema (3) (Same as French 420)

421 Topics in Italian Literature and Cinema (3) (Same as Italian 421)

433 Modern Art and Film (3) (Same as Art Media/Photography 433)

469 Sexuality and Cinema (4) (Same as Women's Studies 469)

489 Special Topics in Film (3) (Same as English 489)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Comparative Literature

GRADUATE COURSES

401-02 Special Topics in Comparative Literature (3,3) Content varies. May be repeated. Maximum 9 hrs.

402 Latin American Studies Seminar (3) Selected topics. May be repeated. Maximum 6 hrs.

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Judaic Studies

GRADUATE COURSES

405 Modern Jewish Thought (3) (Same as Religious Studies 405)

425 Early Christian and Byzantine Art, to 1350 (3) (Same as Art History 425)

431 Medieval Art of the West, 800-1400 (3) (Same as Art History 431)

Latin American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.
Linguistics

GRADUATE COURSES

400 Topics in Linguistics (3) Content varies. May be repeated. Maximum 6 hrs.

411 Linguistic Anthropology (3) (Same as Anthropology 411.)

423 The Development of Diachronic and Synchronic Linguistics (3) Development of Western linguistic thought from Hebrews and Greeks through modern times. Readings from Boas, Sapir, Bloomfield, and others. Prereq: 9 hrs of courses required for Linguistics major or consent of instructor.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, and Spanish 425.)

426 Methods of Historical Linguistics (3) (Same as German 426, French 426, and Spanish 426.)

429 Romance Linguistics (3) (Same as French 429 and Spanish 429.)

435 Structure of the German Language (3) (Same as German 435.)

436 History of the German Language (3) (Same as German 436.)

471 Sociolinguistics (3) (Same as English 471 and Sociology 471.)

472 American English (3) (Same as English 472.)

474 Teaching English as a Second or Foreign Language I (3) (Same as English 474.)

475 Teaching English as a Second or Foreign Language II (3) (Same as English 475.)

476 Second Language Acquisition (3) (Same as Foreign Language 476.)

485 Special Topics in Language (3) (Same as English 485.)

490 Language and Law (3) (Same as English 490.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

593 Independent Study (1-6) Prereq: Consent of Chair of Women's Studies.

Journalism

(College of Communications)

MAJOR

Communications ................................... M.S., Ph.D.

James A. Crook, Director

Professors:

Adamsom, June N. (Emeritus), M.S. ......................... Tennessee

Ashdown, Paul G., Ph.D. .............. Bowling Green

Bowles, Dorothy, Ph.D. ......... North Carolina

Badger, C. Edward, Ph.D. ......... Iowa

Cade, Dozier C. (Emeritus), Ph.D. ......... Iowa

Coe, Jack B. (Emeritus), Ph.D. .............. Minnesota

Leiter, B. Kelly (Emeritus), Ph.D. .............. Missouri

Associate Professors:

Lattmann, Mark (Chair of Excellence), Ph.D. .............. Northern Illinois

Miller, M. Mark, Ph.D. .............. Michigan State

Singletary, James, Ph.D. .............. University of Illinois

Tucker, Willis C. (Emeritus), M.S. .............. Northern Illinois

Associate Professors:

Riehle, Bonnie P., Ph.D. .............. Tennessee

Foley, Daniel, M.S.J. .............. Northwestern

Heller, Robert B., M.A. .............. Syracuse

Morrow, Jerry L., Ph.D. .............. Toledo

Assistant Professors:

Foley, Stephen A., Ph.D. .............. Ohio State

White, Candace L., Ph.D. .............. Georgia

The School of Journalism offers a concentration area for the master's with a major in Communications and participates in the interdisciplinary doctoral program. See Communications for additional information.

Graduate Courses

434 Psychology of Gender (3) (Same as Psychology 434.)

466 Rhetoric of the Woman's Rights Movement to 1930 (3) (Same as Speech Communication 466.)

469 Sexuality and Cinema (4) Exploration of issues surrounding sexuality, gender and cinema from points of view of feminist film criticism. (Same as Cinema Studies 469.)

476 Rhetoric of the Contemporary Feminist Movement (3) (Same as Speech Communication 476.)

483 African-American Women in American Society (3) (Same as African-American Studies 483.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

593 Independent Study (1-6) Prereq: Consent of Chair of Women's Studies.

Social, political, economic, and cultural factors. Relations of communication practices to national and international affairs.

412 Opinion Writing (3) Analysis of editorial positions, practices, and pages. Writing of editorials and columns for newspapers, magazines and company publications. Study and use of rhetorical devices and style. Prereq: Writing for Mass Communication or consent of instructor. (Same as Public Relations 412.)

414 Magazine Article Writing (3) Techniques of writing in-depth articles of feature and specialized magazines. Organizing and presenting material in problems in specialized areas: business, science, agriculture, humanities. Prereq: Writing for Mass Communication or consent of instructor.

416 Issues in Journalism (3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

420 Print Media Management (3) Current business practice among print news media, especially newspapers. Problems in management and production and outlook for new technologies. Prereq: 8 hrs mathematics and/or accounting and senior standing. Sp

431 Public Affairs Reporting (3) Reporting and writing about courts, governments, and public agencies. Event and issue-oriented journalism of politics and public affairs. Prereq: Reporting, E.


444 Journalism as Literature (3) Study of writers from 17th century to modern era whose works have endured as both journalism and literature. Emerging genre called "literary journalism": means of cultural reporting with personal narrative style. Prereq: Consent of instructor.

450 Writing About Science, Technology, and Medicine (3) Writing workshop to analyze examples of successful science writing and write series of articles for general public based on scientific journals, news conferences, technical meetings, and interviews. Prereq: Consent of instructor. (Same as Information Sciences 450.)

451 Environmental Reporting (3) Writing for news media on such environmental issues as strip-mining, water pollution, acid rain, allergens, nuclear power, fossil fuel power, and solid wastes. Presentations from and interviews of experts in environmental science and reporting. Exemplary popular literature in environmental reporting. Prereq: Editing for majors; consent of instructor for non-majors.

455 Issues in Science Communications (3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

456 Science Writing as Literature (3) Survey of important science writing for general public across spectrum of science, engineering and medicine. Works by authors such as Arthur C. Clarke, Stephen. J. Gould, and Richard Selzer. Analysis of literary qualities in quest to understand why some science writing succeeds. Prereq: Consent of instructor.

460 Mass Communications History (3) Development of mass media and role of mass communications in American history. Newspapers, radio, television, and magazines.

465 Women and Mass Media (3) Media effects on women. Media coverage and portrayal of women. Historical and current status of women in mass communication industries.


520 Press-Government Relations (3) Development of adversary relationship between journalists and government officials. Philosophical and legal basis for open reporting of government. Use of press by candidates and incumbents. (Same as Public Relations 520.) F

525 Public Opinion (3) Role of press in developing and influencing public consensus. Social theories of public opinion and analysis of mass media's response. (Same as Public Relations 525.)
Law

MAJOR

DEGREES

Law.................................J.D., J.D.-MBA, J.D.-M.P.A.

Professors:

Anley, Frances Lee, LL.M..................Harvard
Best, Reba, M.L.S........................Florida
Blaze, Douglas A., J.D. .................Georgetown
Cohen, Neil P., LL.M..........................Harvard
Cook, Joseph G., LL.M......................Yale
Galligan, Jr., Thomas C., LL.M........Columbia
Hardin, Patrick J., J.D.............Chicago
Hees, Amy M., J.D.. ..................Virginia
Janes, Durward S. (Emeritus), J.D. ........North Carolina
King, Joseph H., J.D. ......................Pennsylvania
Lacey, Forrest W. (Emeritus), S.J.D. ....Michigan
Le Clercq, Frederic S. (Emeritus), LL.B., Duke
Lloyd, Robert M., J.D. .................Michigan
Overton, Elvin E. (Emeritus), S.J.D. ....Harvard
Phillips, Jerry J., J.D. ..................Yale
Picquet, Cheryn, M.S.L.S. ..............Tennessee
Reynolds, Glenn H., J.D. .................Yale
Rivkin, Dean H., J.D. ......................Vanderbilt
Sewell, Toxey H. (Emeritus), L.L.M. .......George Washington
Stark, Barbara, J.D.......................New York
Wirtz, Richard S., J.D.................Stanford
Zwier, Paul J., L.L.M...............Temple

Associate Professors:

Aarons, Dwight, J.D....................UCLA
Anderson, Gary L., LL.M.............Harvard
Beintema, William J., J.D. .........Miami
Black, Jerry P., Jr., J.D. ...............Vanderbilt
Cornett, Judy M., J.D..............Tennessee
Davies, Thomas Y., J.D..........Northwestern
Gray, Grayfred B., J.D..........Vanderbilt
Haminway, Joan M., J.D.........New York
Kennedy, Desiree A., L.L.M........Temple
Leatherman, Don A., L.L.M.............New York
McAlpine, Janice E., J.D...........Michigan
Medill, Colleen E., J.D.............Kansas
Parker, Carol M., J.D...............Illinois
Pierce, Carl A., J.D.................Yale
Plank, Thomas E., J.D..............Maryland
Stein, Gregory M., J.D.............Columbia
Thorpe, Steven R., J.D..................Mercer
White, Penny J., L.L.M.............Georgetown
Williams, Paulette J., J.D........New York

Assistant Professors:

Cochrans, Cathleen R., M.S.............Tennessee
Davis, Melinda D., M.S.L.S........North Carolina
Marshall, Sibyl D., J.D.............Loyola
Price, Lorettta, M.S.L.S..............Tennessee

The College of Law offers the Doctor of Jurisprudence degree program; a dual degree program with the College of Business Administration leading to the J.D. and the Master of Business Administration degree; and a dual degree program with the Department of Political Science, College of Arts and Sciences, leading to the J.D. and Master of Public Administration. In addition graduate students may be eligible to take a limited number of law courses to count toward a graduate degree.

Current information regarding admission, financial aid, course requirements, academic policies, extracurricular activities, and student services is available from the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours taken in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F.

Eligible law students may receive up to six (6) semester hours of credit toward the J.D. degree for acceptable performance (a grade of B or higher) in upper-level courses that materially contribute to the study of law and which are taken in other departments at The University of Tennessee. Course selection and registration are subject to guidelines approved by the law faculty which include the requirement that any such course be acceptable for credit toward a graduate degree in the department offering the course.

Refer to the Law Catalog and Student Handbook for current degree requirements.

Concentration in Business Transactions

Students interested in a concentration in business transactions must complete all of the following law courses:

818 Fundamental Concepts of Income Taxation
826 Introduction to Business Transactions*
827 Business Associations
972 Income Taxation of Business Organizations
940 Land Finance Law
840 Commercial Law
842 Contract Drafting Seminar
833 Representing Enterprises

None of the above courses may be taken on an S/NC basis (with the exception of 826).

*This course is not required for students who have an undergraduate major in accounting, finance, or business administration, who hold the M.B.A degree, or who are enrolled in the dual J.D.-M.B.A program.

Waivers may also be granted to students who have acquired the requisite business knowledge through other coursework or through practical experience.

Large Animal Clinical Sciences

See College of Veterinary Medicine and Comparative and Experimental Medicine
Concentration in Advocacy and Dispute Resolution

Students interested in a concentration in advocacy and dispute resolution must complete all of the following courses:

- 813 Evidence
- 815 Introduction to Advocacy and Professional Responsibility
- 905 Advocacy Clinic
- 920 Trial Practice
- 921 Pretrial Litigation
- 922 Advanced Trial Advocacy
- 928 Case Development and Resolution

Students electing a concentration in advocacy and dispute resolution may not take any of the above courses on an S/NC basis.

DUAL J.D.-MBA DEGREE PROGRAM

The College of Business Administration and the College of Law offer a coordinated dual degree program leading to the conferral of both the Doctor of Jurisprudence and the Master of Business Administration degrees. A student pursuing the dual program is required to take fewer hours of coursework than would be required if the two degrees were to be earned separately.

Admissions

Applicants for the J.D.-MBA program must make separate application to, and be competitively and independently accepted by, the College of Law for the J.D. degree and The Graduate School and College of Business Administration for the MBA degree, and by the Dual Degree Committee. Students who have been accepted by both colleges may commence studies in the dual program at the beginning of any term subsequent to matriculation in both colleges provided, however, that dual program studies must be started prior to entry into the last 28 hours required for the J.D. degree and the last 16 hours required for the MBA degree.

Curriculum

A dual degree candidate must satisfy the graduation requirements of each college. Dual degree students withdrawing from the dual degree program before completion of both degrees will not receive credit toward graduation from either college for courses in the other college, except as such courses qualify for credit without regard to the dual degree program. For students continuing in the dual degree program, the J.D. and MBA degrees will be awarded upon completion of requirements of the dual degree program.

The College of Law will award a maximum of nine (9) semester hours toward the J.D. degree for acceptable performance in approved graduate-level courses offered by the College of Business Administration. Three of the 9 semester hours must be earned in Accounting 501, 503, or a more advanced accounting course.

The College of Business Administration will award credit toward the MBA for acceptable performance in a maximum of 9 semester hours of approved courses offered by the College of Law.

Except while completing the first year courses in the College of Law, students are encouraged to maximize the integrative facets of the dual program by taking courses in both colleges each year.

Awarding of Grades

For grade recording purposes in the College of Law for graduate business courses and in the College of Business Administration for law school courses, grades awarded will be converted to either Satisfactory or No Credit and will not be included in the computation of the student's grade average or class standing in the college where such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a College of Law course in which the student has earned a C+ grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular graded basis for any appropriate purpose in the college offering the course. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

Non-Law Elective Course Credit

Students enrolled in the J.D.-MBA degree program may not receive credit towards the J.D. degree for courses taken in other departments of the University except for those taken in conjunction with the dual program.

Note: Students are advised to consult the Graduate School's degree requirements as stated in the front section of this catalog as well as the requirements for this college.

DUAL J.D.-M.P.A. PROGRAM

The College of Law and the Department of Political Science in the College of Arts and Sciences offer a coordinated dual degree program leading to the conferment of both the Doctor of Jurisprudence and Master of Public Administration degrees. In this program, a student may earn the M.P.A. and J.D. degrees in about four years rather than the five years that otherwise would be required. Students pursuing the dual degree program should plan to be enrolled in coursework or an internship for one summer term in addition to taking normal course loads for four academic years.

Admission

Applicants for the J.D.-M.P.A. program must make separate application to, and be independently accepted by, the College of Law for the J.D. degree and the Department of Political Science. Applicants must also be accepted by the Dual Degree Committee. All applicants must submit a Law School Admission Test (LSAT) score. An applicant's LSAT score may be substituted for the Graduate Record Exam (GRE) score, which is normally required for admission to the M.P.A. program. Application may be made prior to or after matriculation in either the J.D. or the M.P.A. program, but application to the dual program must be made prior to entry into the last 28 semester hours required for the J.D. degree and prior to entry into the last 15 hours required for the M.P.A. degree.

Curriculum

A dual degree candidate must satisfy the requirements for both the J.D. and M.P.A. degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The M.P.A. program will award a maximum of 9 semester hours of credit toward the M.P.A. degree for successful completion of approved courses offered in the College of Law. All courses for which credit is awarded must be approved by the J.D.-M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

During the first two years in the dual program, students will spend one academic year completing the required first year of the College of Law curriculum and one academic year taking courses solely in the M.P.A. program. During those first two years, students may not take courses in the opposite area without the approval of the J.D.-M.P.A. coordinators in both academic units. In the third and fourth years, students are strongly encouraged to take both law and political science courses each semester.

Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

Awarding of Grades

For grade recording purposes in the College of Law and the Department of Political Science, grades awarded in courses in the other unit will be converted to either Satisfactory or No Credit and will not be computed in determining a student's GPA or class standing. The College of Law will award a grade of Satisfactory for an approved M.P.A. course in which the student earns a grade of B or higher and a grade of No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of C+ or higher and a grade of No Credit for any lower grade. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

POLICY FOR GRADUATE STUDENTS TAKING LAW COURSES

Students pursuing a graduate degree in another college may, upon approval of the College of Law and the major chairperson, take up to 6 semester hours of law courses and receive credit toward the graduate degree. The graduate student must register for the law course during regular registration at the College of Law requesting an S/NC
penses of legal system to environmental problems: environmental litigation, Clean Air Act; Clean Water Act; National Environmental Policy Act; and selected regulatory issues.

857 Environmental Law Seminar (2) Selected topics in environmental law.

873 American Legal History (3) Selected topics in American legal history.

877 Jurisprudence (3) Critical or comparative examination of legal theories, concepts, and problems; legal positivism; natural law theory; legal realism; idealism; historical jurisprudence; utilitarianism; Kantianism; sociological jurisprudence; policy science; and critical studies.

879 Law and Economics (3) Relationship between regulatory issues. Responses of legal systems to environmental problems: status of persons abroad; acquisition and use of natural resources and doctrines, principles, and rules of law that are applicable to both law and life.

881 Law and Literature (3) Reading literary works, analysis of works, and approaches to gender justice. Reading of works by women in the American legal system: women as political actors, as family members, as participants in workforce, as targets of violence, and as leaders of movements.

886 Public International Law (3) Law creating processes and doctrines, principles and rules of law that regulate the behavior of states and other international law entities.

887 International Business Transactions (3) Legal status of persons abroad; acquisition and use of property within a foreign country; doing business abroad as a foreign corporation; engaging in business within a foreign country; acquisition and amputation of contracts or concessions.

889 International Law Seminar (2) Current international law problems. Prereq: 886 or 887.

895 Labor Relations Law (3) Political, social, and economic influences in development of federal labor relations law; labor-management relations; collective bargaining; union and employer unfair labor practices; strikes, lockouts, boycotts, and collective bargaining processes; enforcement of collective agreements; individual rights of employees; federal preemption and state regulation.

896 Employment Law (3) Legal regulation of employment relationship: legal, social, and economic influences in employment/employee relationship: enforcement of legally prescribed minimum standards of compensation and safety; constraints on termination of employment; regulation of retirement systems.

898 Arbitration Seminar (2) Arbitration of labor agreements; judicial and legislative developments; nature of process; relationship to collective bargaining: selected arbitration problems on various topics under collective agreements, and role of lawyers and arbitrators. Prereq: 895.

899 Labor Relations Seminar (2) Selected labor relations problems. Prereq: 895.

905 Advocacy Clinic (6) Supervised fieldwork requiring students to assume substantial responsibility for representing clients in various civil and criminal legal problems. Exploration and development of fundamental professional skills involved in practicing law: interviewing and counseling clients, negotiating with opponents, preparing for, and participating in, various types of legal proceedings.

906 Intellectual Property (3) Intellectual property and computerized research. Problems of advanced technologies; adaptation of law to novel issues; approaches to gender justice.

907 Conflict of Laws (3) Jurisdiction, foreign judgments, and conflict of laws.

910 Federal Courts (3) Jurisdiction of federal courts; conflicts between federal and state judicial systems.

918 Remedies (4) Judicial remedies: damages, restitution, and equitable relief; availability, limitations and measurement of various remedies; comparison of contract, tort, and property-related remedies.

920 Trial Practice (3) Litigation through simulation, trial problems and preparation: basic trial strategy; professional responsibility; fact investigation and witness preparation; trial advocacy; expert witness; evidence; selection and instruction of jurors; opening and closing arguments. Written work: pleadings, motions, interrogatories or memoranda. Coreq: 813 for students electing competition in advocacy. Prereq: 813 for all other students.

921 Pre-Trial Litigation (3) Civil pre-trial process. Drafting of actual pre-trial documents in civil cases: complaint, motions, answers, discovery, inspection, class certification papers, motions to dismiss and for summary judgment, and various discovery papers.

922 Advanced Trial Advocacy (3) Study and development of trial skills: trial preparation, advanced direct and cross-examination, expert testimony, jury selection, jury instruction, technology in courtroom, and motion practice. Prereq: 920.

925 Appellate Practice Seminar (2) Federal and Tennessee Rules of Appellate Procedure, local rules of federal and Tennessee courts; success of several United States Supreme Court cases and preparation of an appellate brief based on record of actual case.

927 Investigating, Counseling and Negotiation (3) Development of conceptual and practical frameworks for the use of alternative dispute resolution methods; mediation and negotiated settlement; and lawyer's role in tasks. Readings of different methods, strategies and perspectives from recent literature involving law as a function of mediation and negotiation. Simulation and videotape critiques of tasks. Relevant ethical issues and techniques of dispute resolution. Open to students who have taken 904 or 906.

928 Case Development and Resolution (4) Theory and development of skills for case development and management; interviewing, counseling, and fact investigation. Ways of resolving disputes without litigation. Not open to students who have taken 927.

929 Teaching Clients the Law (3) Communication of law and legal principles to persons other than lawyers. Development of skills by teaching the practical law course to high school or adult students and by writing research papers that synthesize Tennessee or federal law in plain language.

930 Taxation of Transfers (4) Nature, creation, termination, and modification of trusts, fiduciary administration; intestate succession; execution, revocation, probate and contests; transfer of property; construction of various types of future interests; construction of limitations; application of the rule against perpetuities.


935 Land Use Law (3) Private land use controls: nuisance, easements, real covenants, equitable servitude and homestead associations; public land use controls: zoning, subdivision controls, eminent domain, and regulatory takings.

936 Land Use Law (3) Private land use controls: nuisance, easements, real covenants, equitable servitude and homestead associations; public land use controls: zoning, subdivision controls, eminent domain, and regulatory takings.

940 Land Finance Law (3) Financing devices: mortgage, deeds of trust and land contracts; problems of priorities; transfer of secured interests when debt assumed or taken subject to security interest: default, exercise of equity of redemption and/or statutory right of redemption; mechanics' lien and materialmen's liens; contemporary developments in areas as condominiums, cooperatives, housing sub-divisions, and shopping centers.

941 Land Acquisition and Development Seminar (2) Simulated representation of various parties: sellers, buyers, construction lenders, permanent lenders, architects, contractors, subcontractors and consultants, in development of real estate project. Negotiation and drafting of documents necessary in large commercial development. Prereq: 920 and third-year standing.

943 Land Use Law Seminar (3) Private land use controls: nuisance, easements, real covenants, equitable servitude and homestead associations; public land use controls: zoning, subdivision controls, eminent domain, and regulatory takings.

950 Computers and Law (3) Impact of computers on law and practice of law: expert systems; legal skills required in building expert systems; common law office uses of computers; and computerized research. Preparation of lawyers to think effectively concerning use of computers. Prior computer experience not necessary.

956 Entertainment Law (3) Role of lawyer and law in entertainment industry. Course content varies. Music Industry, film, television, professional sports, and advertising relationships; recording contract negotiations; industry labor unions; and performing right organizations.

957 Law, Science and Technology (3) Legal implications of advanced technologies; adaptation of law to innovations; knowledge of new technologies and new ways of doing things. Biotechnology, regulation of scientific research, space law, legal issues relating to new inventions and technologies, and biotechnology, and others designated by instructor.

958 Women and The Law (3) Status of women in American legal system: women as political actors, as family members, as participants in workforce, as targets of violence, and as legal professionals; introduction to current competing approaches to gender issues.

959 Intellectual Property (3) Intellectual property and related interests under federal and state law; patents; trademarks; trade secrets; copyright; right of publicity; unfair competition.


962 Law and Medicine Seminar (2) Effects of legal rules on delivery and quality of medical care: nature of physician-patient relationship; unauthorized practice of medicine; medical education, licensing and specialization; hospital staff privileges; medical malpractice liability; standard of care, proof, causation, defenses, and damages; protection of patient autonomy: consent, information, comprehension and the right to die; control of communicable diseases; organ transplantation and medical resource allocation.

970 Income Tax II (3) Corporate reorganizations and distributions; transactions among corporations and shareholders. Prereq: 818.


973 Wealth Transfer Taxation (3) Taxation of transfers of wealth during life (gift tax) and at death (estate tax) and generation skipping transfers. Prereq or coreq: 930.

975 Tax Theory (3) Method and purposes of government revenue collection through examination of economic and political theory; comparative analysis of various act and proposed patterns of taxation: income tax, consumption tax, sales tax, and value-added tax. Required preparation of expository essay on aspect of tax theory chosen by student. Limited enrollment.


980 Insurance (3) Types of insurance: life, property, health, accident and liability insurance; regulation of insurance industry; interpretation of insurance contracts; drafting of insurance policies; warranties and representations; coverage and exclusions; duties of agents; excess liability; subrogation; and bad faith actions. Liability insurance defense: duty to defend, notice and cooperation issues, and conflicts of interest.

983 Products Liability (3) Scope of doctrine and theories of recovery; potential plaintiffs and defendants; statutory and case-specific limitations on recovery; damages; causation; and defenses.
985 Social Legislation (3) Systems other than traditional tort remedies for compensating victims of workplace accidents, and diseases, and for compensating disabled persons. Workers' compensation requirements for covered employer-employee relationships; accidental injuries or occupational diseases arising out of and in the course of employment; nature of medical, disability, and death benefits; exclusiveness of compensation remedy against employer and co-workers; rights and liabilities of non-employees; administration and procedural aspects of Workers' Compensation practice; and various law reform measures. Brief introduction to and sampling of cases involving Social Security disability claims.  

990 Issues in the Law (3) Selected topics. May be repeated.  

991 Issues in the Law Seminar (2) Selected topics. May be repeated.  

993 Directed Research (1-2) Independent research and writing under direct supervision of faculty member. Proposals must be approved by supervising faculty member and by the Dean or the Dean's designee. Maximum of once each semester during last two years of study. Prereq: Second-year standing.  

994 Independent Study (1-4) Independent study under direct supervision of faculty member. Proposals must be approved by supervising faculty member and by the Dean or the Dean's designee. Maximum of once each semester during last three semesters of study.  

996 Law Review (1) Performance of duties as staff member and editor of Tennessee Law Review. Responsibilities vary each semester as specified in Tennessee Law Review Policy Manual: writing of casenote, comment, or article, and/or performance of other assigned duties related to operations of Tennessee Law Review. Completion of potentially publishable comment or article for Tennessee Law Review satisfies exposure to research requirement. May be repeated. S/NC only. (Does not count toward total number of elective upper division courses taken S/NC.)  

997 Moot Court (1) Participation as member of faculty-supervised interscholastic moot court competition. May be repeated. S/NC only. (Will not count toward total number of elective upper division courses taken S/NC.)  

998 Planning and Drafting Project (1) Preparation and completion of planning and drafting project under faculty supervision in conjunction with substantive courses when such planning and drafting option is provided by course instructor. May be repeated.  

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**Life Sciences**

(College of Arts and Sciences)  

**MAJOR**  

**DEGREES**  

Life Sciences ......................... M.S., Ph.D.  

W.F. Harris, Chair  

The program leading to the M.S. and Ph.D. degrees in Life Sciences are interdepartmental and intercollegiate and are designed to augment offerings of individual departments in two concentrations: genome science and technology and plant physiology and genetics. Students interested in these areas should contact either the Life Sciences chairperson or the director of the area of interest. Each concentration is administered separately and has unique admission requirements.  

**CONCENTRATIONS**  

Genome Science and Technology  

The University of Tennessee—Oak Ridge National Laboratory Graduate Program in Genome Science and Technology (GST) is a unique and multidisciplinary program for full time graduate study leading to the M.S. or Ph.D. degree. The program focuses on development of the biological and computational sciences related to genome sequences, and the program is designed to take advantage of collaboration of The University of Tennessee and the Oak Ridge National Laboratory. Students will be trained in emerging areas of genome science, with emphasis on molecular and computational biology and bioinformatics, and solutions to problems concerning the interactions of physiology and genetics in applied and fundamental aspects of plant science are the focus.  

Admission requirements are a Bachelor's degree with a major in a biological, behav-

ioral, or physical science; GRE (general) score; three letters of recommendation; and coursework including a year of calculus (differential and integral), one year of chemistry and a year of physics. Specific course deficiencies may be corrected during the first year.  

Required courses are Life Sciences 510; Botany 521, 522; Biochemistry and Cellular and Molecular Biology 511, 512; Plant and Soil Science 471 or Ecology and Evolutionary Biology 560; Plant and Soil Science 552; Microbiology 410. The master's degree requires a minimum of 30 semester hours of study approved by the student's committee, a thesis, and an oral examination. The minimum requirements for the doctoral degree include at least 3 hours above the 600 level, 24 semester hours of course 600, courses approved by the student's committee, a comprehensive examination, a doctoral dissertation, and a defense of dissertation.  

**GRADUATE COURSES**  

500 Thesis (1-15) P/NP only. E  

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and for faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E  

503 Graduate Research Participation (3-12) Special advanced research project not related to dissertation research. Topics chosen with consent of instructor. May be repeated. Maximum 6 hrs.  

505 Research Rotation (2) Laboratory rotations with faculty member on clearly defined projects. Written proposal and oral report. May be repeated. Maximum 3 hrs.  

506 Computational Biology and Genome Informatics (3) Computational basis of nucleotide and protein sequence analysis; pairwise sequence comparison, multiple sequence alignments, gene and peptide trees, Genome annotation and feature finding. Computational protein structure analysis; threading, homology modeling, ab initio methods. Prereq: Computer Science 140 Data Structures or consent of instructor.  

509 Biotechnology Seminar (1-2) Topics of importance to biotechnology. May be repeated. Maximum 6 hrs.  

510 Special Topics in Life Sciences (1-3) Specializations in biotechnology, cellular, molecular, and developmental biology; environmental toxicology; ethology; plant, physiology and genetics; and physiology. May be repeated. Maximum 9 hrs.  

515-16 Introduction to Genome Science and Technology I, II (1, 1) S16—Introduction to research in genome science & technology concentration. 516—Science and ethics of practice of science. S/NC only.  

520-21 Genome Science and Technology I, II (3, 3) 520—Overview of genomics, advanced genetics principles, computational biology and bioinformatics. 521—Computational biology and informatics, analytical technologies and special techniques.  

540-41 Colloquium (1, 1) Invited speakers. Topics announced in advance. Required every semester in residence after first year. May be repeated. Maximum 6 hrs.  

550 Mammalian Genetics (3) Genetic variation, inheritance, phenotypic traits, molecular genetics and genomics, mutagenesis in laboratory rodents and other mammals. Prereq: 520-21.  

591 Foreign Study (1-15) See College of Arts and Sciences.  

592 Off-Campus Study (1-15) See College of Arts and Sciences.  

593 Independent Study (1-15) See College of Arts and Sciences.
**Management (College of Business Administration)**

**MAJOR DEGREES**

Business Administration ............... MBA, Ph.D.

Oscar Fowler, Head

**Professors:**


**Associate Professors:**

Bowers, Melissa R., Management; Bozdogan, Hamparsum, Statistics; Edirisinghe, Chanaka P., Management; Fowler, Oscar S., Management; Gilbert, Kenneth C., Management; Leitnaker, Mary G., Statistics; Noon, Charles E., Management; Ralston, Bruce A., Geography.

**Supporting areas are available in other departments of the College of Business Administration as well as in computer science, public administration, geography, health, and other areas, subject to approval by the Management Science Committee.**

**MINOR IN ENVIRONMENTAL POLICY**

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

**GRADUATE COURSES**

**500 Thesis (1-15) P/NP only. E**

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E

511 Organizational Theory: Integrated Structure and Behavior (3) Cases, group projects, discussion; organizational theories and their application; contextual factors of organizations: environment, size, technology; organizational structure configurations, organization design; social influences on organizational effectiveness: motivation, leadership, group behavior, intergroup relations, organization change and development.

521 Personnel Administration (3) Personnel functions and human resource management. Community relations, recruiting, selection, training, performance evaluation, wage and salary administration, legal framework as it affects personnel.

531 Management of Technology-Based Organizations (3) Role of technology and innovation in formulation and implementation of strategy. Management of research and development function and coordination with other functions. Management of scientists and engineers.

541 Operations Management I (3) Techniques applicable to design of systems in operations function.

542 Operations Management II (3) Operations planning and control function. Application of models to real-world systems.

551 Management of New Ventures (3) Evaluation of various functional disciplines and their application to general management of ventures formed both within larger corporations and independently. Preparation of a venture plan, case analysis.

571 International Management (3) Analysis of environment of international business firms and impact of internal and external factors on managerial decisions.

581 Environmental Management (3) Managerial frameworks for addressing environmental issues. Most pressing environmental challenges; options compatible with sustained business performance. Cases, field projects, research papers.

593 Directed Independent Study (1-3) Topic of mutual interest. Available only by prearrangement with supervising faculty member. May be repeated. Maximum 6 hrs. S/N/C or letter grade.

595 Selected Topics in Current Management Issues (1-3) In-depth consideration of current issues. Managerial impact of emerging topics. Prereq: Consent of instructor.

**600 Doctoral Research and Dissertation (3-15) P/NP only. E**

**601 Research Methods (3) Seminar covering broad range of issues: research process as applied to study of strategic management. Literature and examples of research. Research proposal.**

610 Seminar in Advanced Organization Theory (3) Analysis of functioning of complex organizations. Classical and open systems models, organization growth and change, organizational effectiveness and design of complex organizations.

611 Seminar in Strategic Management I (3) Analysis of concepts and research in strategic management.

612 Seminar in Strategic Management II (3) Analysis of concepts and research in strategic management.

613 Seminar in Strategic Management III (3) Review and analysis of important books and monographs in strategic management. Understanding evolution of thought and emergence of distinct paradigmas.

**Management Science (College of Business Administration)**

**MAJORS DEGREES**

Management Science ............... M.S., Ph.D.

Chanaka Edirisinghe, Chairperson

**Committee:**

Bowers, Melissa R., Management; Bozdogan, Hamparsum, Statistics; Edirisinghe, Chanaka P., Management; Fowler, Oscar S., Management; Gilbert, Kenneth C., Management; Leitnaker, Mary G., Statistics; Noon, Charles E., Management; Ralston, Bruce A., Geography.

**THE MASTER'S PROGRAM**

The M.S. program in Management Science is designed as preparation for a career in the application of quantitative techniques for the solution of complex problems. The program's flexibility also makes it appropriate as preparation for doctoral study in Management Science.

Management Science coursework will expose students to both the theoretical development of quantitative techniques and their application to managerial decision making. In addition to the development of sufficient mathematical maturity for creative use of quantitative skills, the program requires concentrated study in a supporting area.

Supporting areas are available in other departments of the College of Business Administration as well as in computer science, public administration, geography, health, and other areas, subject to approval by the Management Science Committee.
Admission Requirements
The master's program requires three applicant recommendation forms and the GRE or GMAT. Applications are encouraged from all majors, but a mathematics background equivalent to the completion of at least two years of college calculus and proficiency in a computer language is required. The program is designed to be completed in four semesters by full-time students. However, students may start the program in any semester and may pursue an M.S. degree program in Management Science on a part-time basis.

Course Requirements
- Management Science 531, 532, 533, 534, and 691 or 692
- Statistics 563
- Applied specialization area (approved by advisor)
- Technical elective: Statistics (500 level or above as approved by advisor)
- Mathematics (400 level or above as approved by advisor)
- Industrial Engineering (400 level or above as approved by advisor)
- Other elective (approved by advisor)
- Total: 40

A thesis option is available to qualified students. The Management Science Committee will work closely with the student in tailoring a program to his/her needs. The committee must approve a tentative overall program during the student's first semester and must approve all courses on a semester-by-semester basis.

Recognizing the diverse backgrounds and needs of Management Science M.S. students, the Management Science Committee is prepared to waive some of the above requirements on an individual basis. The total course load will remain 40 hours for all students.

THE DOCTORAL PROGRAM
The Ph.D. program in Management Science is designed to prepare students for research related to the application of mathematical tools to complex decision making. Three primary objectives of the program are:
1. to provide, through management science coursework, a thorough knowledge of common Management Science/Operations Research mathematical models and their uses;
2. to provide sufficient advanced study in a supporting area to qualify the graduate for a joint faculty position in the supporting area and management science. The candidate may choose from the business functional areas (accounting, finance, marketing, management, and transportation and logistics) or other disciplines, (e.g., computer science, forestry, ecology, and public administration);
3. to develop in the student, through coursework in mathematics, statistics and computer science, a high degree of mathematical maturity to enhance a potential career in management, research, or teaching.

Admission Requirements
The doctoral program requires three applicant recommendation forms and the GRE or GMAT, in addition to the Graduate School's requirements.

Coursework
A minimum of 48 semester hours of coursework taken for graduate credit (exclusive of thesis or dissertation) is required. Some of this may be the coursework from a master's program although a master's is not a prerequisite for the doctorate. The candidate must complete a minimum of 24 semester hours at The University of Tennessee, at least 6 of which must be at the 600 level. Both of these requirements are also exclusive of thesis or dissertation credits. Entering students who have completed graduate studies in applicable fields will be granted course credits for work which is equivalent to required courses in the program.

The program includes approximately 16 to 20 semester hours of coursework in the applied area.

Qualifying Examinations
The student must demonstrate mastery of probability theory and statistical inference, Statistics 563, 564, by passing a written qualifying examination.

Mastery of 12 to 14 semester hours in mathematics coursework must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis, either Mathematics 471, 472, 453, and 571, or 571-572, and real analysis, Mathematics 445-446. Other options may be approved. In exceptional circumstances, the faculty will consider waiving the mathematics and/or statistics qualifying examinations.

These requirements generally are completed by the end of the first year of the program.

There is no foreign language requirement.

Comprehensive Examination
Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written comprehensive examination covering the theory of deterministic and stochastic management science models. Topics included in this examination are determined on an individual basis.

Students will be expected to demonstrate an integrative ability that goes beyond simple mastery of course content.

Research and Dissertation
The student must complete 24 semester hours of Management Science 600: Doctoral Research and Dissertation, through which he/she is expected to make a significant contribution to the science. A final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate. This effort, which is beyond the minimum 48 hours of coursework, normally is completed in the third year of the program.

ACADEMIC STANDARDS
A graduate student in the College of Business Administration whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative graduate grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next semester's coursework as established by the degree program for full-time students and the next two semester's coursework as established by the degree program for part-time students.

PREREQUISITES FOR MANAGEMENT SCIENCE COURSES
The Management Science Program is interdisciplinary and students in other degree programs are encouraged to enroll in management science courses. Course prerequisites are designed to indicate the level at which courses are taught. Interested students whose prior coursework does not match the prerequisites are encouraged to seek the instructor's guidance and consent to enroll.

GRADUATE COURSES
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
526 Systems Modeling and Simulation (3) (Same as Industrial Engineering 526.)
531 Mathematical Programming (3) Linear programming solution procedures, duality, sensitivity, and parametric analysis, linear fractional, piecewise-linear, separable, and integer programming, transportation linear programs, Prereq: Fundamentals of matrix algebra. (Same as Industrial Engineering 520.)
532 Stochastic Models in Management Science (3) Discrete-time Markov chains, Poisson processes, continuous-time Markov chains, renewal theory, and queuing theory, Prereq: Statistics 563 and Mathematical Analysis or consent of instructor. S
533 Computational Mathematical Programming (3) Computational aspects of mathematical programming models, in particular for large systems, Prereq: S31 and proficiency in computer language.
534 Management Science Methods in Business (3) Application of methods from S 531, 532, and 533 to real world problems in business/industry.
593 Management Science Problems (1-60) Directed study on subject of mutual interest, E
600 Doctoral Research and Dissertation (3-15) P/NP only. E
621 Network Flows (3) Treatment of network optimization algorithms, transportation and transshipment models and primal dual and primal-basis tree methods. Prereq: S31 or equivalent.
631 Integer Programming (3) Theoretical and computational aspects of linear programming with integer variables, branch and bound, cutting plane, and group theoretic algorithms. Prereq: S31 or equivalent.
651 Nonlinear Optimization (3) Kuhn-Tucker theory in nonlinear programming, necessary and sufficient conditions for constrained and unconstrained nonlinear programs, search techniques, quadratic programming, duality and sensitivity analysis, Prereq: S31 or equivalent, proficiency in computer language. (Same as Industrial Engineering 602.)
681 Special Topics (3) Prereq: S31, S52 and consent of instructor. May be repeated. Maximum 9 hrs.
691-92 Management Science Seminar (1,1) Subjects selected from current literature. S/NC only.
### Marketing, Logistics and Transportation

**(College of Business Administration)**

#### MAJOR DEGREES

**Business Administration**

- MBA, Ph.D.

**Richard C. Reizenstein, Acting Head**

#### Professors:

- Barnaby, D. J., Ph.D. — Purdue
- Cadotte, E. R., Ph.D. — Ohio State
- Davis, F. W., Jr., Ph.D. — Michigan State
- Dier, G. N., DBA — Indiana
- Langley, C. J. (Dove Prof.), Jr., Ph.D. — Penn State
- Mentzer, J. T. (Harry J. Bruce Chair of Excellence), Ph.D. — Michigan State
- Mundy, R. A. (Taylor Prof.), Ph.D. — Penn State
- Schumann, D. W., Ph.D. — Missouri
- Woodruff, R. B. (Proffitt's Prof.), DBA — Indiana

#### Associate Professors:

- Dahbolkar, P. A., Ph.D. — Georgia State
- Foggin, J. H. (Liaison), DBA — Indiana
- Gardial, S. F., Ph.D. — Houston
- Holcomb, M. C., Ph.D. — Tennessee
- Reizenstein, R. C., Ph.D. — Cornell
- Rentz, J. O. (Liaison), Ph.D. — Georgia

#### Assistant Professors:

- Moon, M. A., Ph.D. — North Carolina
- Norek, C. D., Ph.D. — Ohio State

### BUSINESS ADMINISTRATION CONCENTRATIONS

For complete listing of MBA and Ph.D. program requirements, see Business Administration.

**MBA Concentration:** Logistics and Transportation, Marketing.

Minimum course requirements for logistics and transportation—501, 508, and one course from the following courses: 504, 506, 507, 509, and 599. For marketing—511 and 512.

**Ph.D. Concentration:** Logistics and Transportation, Marketing.

Minimum course requirements for logistics and transportation—12 hours to include 612, 614, 615. For marketing—12 hours from among the following courses: 601, 612, 614, 615, 617.

### Logistics and Transportation

#### GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>Survey of Logistics and Transportation (3-15)</td>
</tr>
<tr>
<td>502</td>
<td>Registration for Use of Facilities (3-15)</td>
</tr>
<tr>
<td>504</td>
<td>Freight Carrier Systems and Management (3)</td>
</tr>
<tr>
<td>506</td>
<td>Logistics Systems Management (3)</td>
</tr>
<tr>
<td>507</td>
<td>Global Marketing (3)</td>
</tr>
<tr>
<td>509</td>
<td>Principles of Marketing Management for Non-MBA Students (3)</td>
</tr>
<tr>
<td>511</td>
<td>MBA Marketing Concentration I (6)</td>
</tr>
<tr>
<td>512</td>
<td>MBA Marketing Concentration II (3)</td>
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<td>593</td>
<td>Independent Study (3)</td>
</tr>
<tr>
<td>599</td>
<td>Special Topics Seminar (3)</td>
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### Marketing

#### GRADUATE COURSES

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
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<td>599</td>
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</tr>
</tbody>
</table>

### Materials Science and Engineering

**(College of Engineering)**

#### MAJORS DEGREES

**Metallurgical Engineering**

- M.S., Ph.D.

**Polymer Engineering**

- M.S., Ph.D.

**Joseph E. Spruiell, Head**

#### Professors:

- Benson, R. S., Ph.D. — Florida State
- Brooks, C. R., Ph.D. — Tennessee
- Buchanan, Raymond A., Ph.D. — Vanderbilt
- Clark, Edward S. (Emeritus), Ph.D. — California
- Fellers, J. F., Ph.D. — Akron
- Liaw, P. K. (Racheff Chair of Excellence), Ph.D. — Northwestern
- Lowndes, Douglas H., Ph.D. — Colorado
- Lundin, Carl D., Ph.D. — Penn State
- McNab, Carl J., Ph.D. — Kentucky
- Oliver, Ben F., Ph.D. — Penn State

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Not be used toward degree requirements. May be repeated. S/NC only. E

504 Freight Carrier Systems and Management (3) Analysis of freight carrier management's efforts to provide services demanded by customers in logistics and transportation marketplace.

506 Logistics Systems Management (3) Development of strategy for management of logistics systems. Executive level integration of logistics operations with marketing, production, and other decision areas. Practical applications through case approach and simulation game.

507 Global Marketing (3) Strategic issues related to international and multi-national marketing operations; identification and evaluation of opportunities in overseas markets; coordination of strategies in world markets.

509 Special Topics Seminar (3) Topics vary: market forecasting, market segmentation, services marketing, marketing channels, and related issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

600 Doctoral Research and Dissertation (3-15) P/NP only. E

601 Marketing Theory (3) Nature and scope of marketing; role of theory development and theory testing important to marketing research.

611 Seminar in Theoretical Foundations (3) Theoretical foundations and frameworks common to business research. Historical and philosophy of science perspectives. (Same as Logistics and Transportation 611.)

612 Research Methods I (3) Research process: philosophical foundations, problem formulation, grounded theory, qualitative methods and analysis, measurement, sources of error, experimental design and analysis, and survey design and analysis. (Same as Logistics and Transportation 612.)

613 Research Methods II (3) Practical application of data analysis techniques. Experience with sophisticated statistical techniques, using real marketing databases.

614 Contemporary Marketing Thought (3) Representative topics comprising content of marketing knowledge: macro-marketing, marketing channels, and competitor behavior; marketing strategy; marketing mix tools; and ethical issues in marketing. Examination of research for contributions to advancing knowledge and opportunities for new research.

615 Seminar in Buyer Behavior Research (3) Theoretical perspective and research processes describing people in their roles as buyers, users, and evaluators of goods and services. Important research issues and practical applications related to buyer behavior.

616 Measurement (3) Measurement and measurement process: design and development of tools, process of testing, and determination of reliability and validity.

617 Special Topics (3) Topics vary: marketing strategy, advanced consumer behavior, influence and persuasion theory and strategy, pricing issues, international marketing issues, and nonprofit organization marketing issues.

693 Independent Study (1-6) Directed research on subject of mutual interest to student and faculty. May be repeated. Prereq: Consent of instructor.
Graduate programs are offered leading to the degrees of Master of Science and Doctor of Philosophy in Metallurgical Engineering or Polymer Engineering. Both the metallurgical and polymer programs are flexible and interdisciplinary in nature. Students are admitted from a wide range of disciplines; these include physics, chemistry, chemical engineering, mechanical engineering, electrical engineering, materials engineering, and engineering science programs. Prospective students should consult materials science and engineering faculty concerning development of individual concentrations or special programs compatible with their backgrounds and goals.

Areas of concentration within the metallurgical engineering program include physical metallurgy; materials processing; welding metallurgy and materials joining; corrosion behavior; failure analysis; and mechanical and physical behavior of materials. Specializations in electronic, ceramic, and composite materials are available.

Areas of concentration within the polymer engineering program include rheology and polymer processing; polymer morphology; mechanical, physical, and chemical behavior of polymers; and composite materials.

THE MASTER'S PROGRAM

Thesis Option
A total of 30 semester hours is required for the M.S. degree in either Metallurgical Engineering or Polymer Engineering. Additional requirements include:

1. A major consisting of at least 12 semester hours of graduate courses in metallurgical engineering or polymer engineering. The polymer engineering major must include 540, 541, 543, 546, 549, 550 and 572 unless similar material has been covered in prior coursework.
2. Additional courses up to 12 hours total in related areas.
4. Satisfactory performance on a comprehensive oral examination administered by the faculty committee.

Non-Thesis Option
Any candidate may apply for a non-thesis option. Upon acceptance, a supervisory committee of three will be appointed. At least two members of the committee will be from the faculty in the major area, either metallurgical engineering or polymer engineering. The requirements for completion of the non-thesis option are as follows:

1. Completion of a total of 30 hours of graduate coursework. At least 18 of those hours must be in the department, and up to 12 hours may be in related areas. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. The polymer engineering major must include the same courses required for the thesis option. The candidate's degree program must be approved by the faculty committee.
2. Satisfactory completion of a qualifying experience such as MSE 580 (Critical Review).
3. Satisfactory performance on a comprehensive examination administered by the faculty committee.

THE DOCTORAL PROGRAM

After one year in residence and with the approval of the doctoral committee, a student may proceed directly to the doctoral program without completion of a master's degree. Departmental requirements for completion of the doctoral degree are:

1. A. For students proceeding directly to the Ph.D. from the bachelor's degree: 48 graduate course credit hours with at least six hours of 600-level courses. Six hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 12 credit hours must be coursework, not dissertation research. The polymer engineering major must include the same courses required for the master's thesis option.
   b. For students having a master's degree in Metallurgical Engineering, Polymer Engineering or Materials Science and Engineering: 18 additional graduate course credits with at least six hours of 600-level courses. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 12 credit hours must be courses in the department.
   2. Students must complete at least 24 hours of dissertation credits.
   3. Satisfactory performance on a comprehensive examination, usually given in two parts, and covering such topics as materials science and engineering, metallurgical or polymer engineering operations and processes, thermodynamics, technology, mathematics, physics, chemistry, and other related fields.
   4. Active participation in graduate seminars conducted by the department. Resident students must register for the appropriate 503 or 504 every semester offered.

GRADUATE COURSES

405 Structural Characterization of Materials (4) X-ray diffraction and fluorescence; scanning transmission electron microscopy; microanalytical techniques.

421 Mechanical Behavior of Materials II (3) Descriptions of stress and strain; linear elastic constitutive equations; isotropic and anisotropic moduli in various materials; yield criteria; brittle fracture; creep; plastic strain constitutive equations, forming operations and
The Mathematics Department has three graduate degrees: (1) the Master of Mathematics degree, intended primarily for teachers, (2) the Master of Science degree, designed to prepare students for industrial employment and for teaching, and (3) the Doctor of Philosophy degree, designed to prepare students for industrial employment and for college and university teaching and research. Contact the department office for additional information. A student offering mathematics as a minor for the master's degree is required to obtain at least 6 hours of resident graduate credit in courses numbered above 400 and approved by both the major department and the Department of Mathematics. For additional information, please visit the graduate website on the Department of Mathematics' homepage at www.math.utk.edu.
THE MASTER OF MATHEMATICS PROGRAM

Before admission to the Master of Mathematics program, the applicant must have either (a) certification for teaching secondary mathematics in at least one state, or (b) three years of elementary school, secondary school, or community college teaching experience. Applicants must have successfully completed one year of calculus (141-42 or equivalent) and a course in matrix algebra (251 or equivalent).

The following requirements must be met:
1. Complete 30 hours of coursework of which 21 must be at the 500 level. The coursework must include 504, 505, 506, 507, and 6 hours in 509. At most, 6 hours may be taken outside the Department of Mathematics (selected in consultation with the advisor).
2. Pass a final examination upon completion of all coursework.

In exceptional circumstances, part of admission requirement (b) might be satisfied concurrently with coursework. Normally, Master of Mathematics degree students will start the program by taking 504 during the summer.

THE MASTER OF SCIENCE PROGRAM

The department offers two options for the Master of Science degree. The first option requires a thesis for which 6 hours must be earned along with 24 additional hours of work in acceptable coursework numbered above 400. Of the additional hours, 8 may be in an area outside the department and 15 must be in courses in mathematics numbered above 500.

After one semester of graduate study, a student whose advisory committee gives its approval may choose the non-thesis option. Normally, Master of Science degree students will start the program by taking 504 during the summer.

Concentration in Applied Mathematics

For this concentration, available under the thesis or the non-thesis option, the student must complete the following:

1. Prerequisite courses:
   d. Matrix Algebra II 453.

2. One hour of Seminar in Applied Mathematics 519 or Seminar in Mathematical Ecology 589.

3. One course from each of the following five areas:
   e. Statistics - Statistics 525, Stochastic Modeling 527, Statistical Methods 571 (Statistics), Biomometry 560 (Ecology and Evolutionary Biology).

THE DOCTORAL PROGRAM

For the Ph.D. program in Mathematics, the student must meet the following four requirements in addition to those of the Graduate School:

1. Satisfy either the standard program or the interdisciplinary mathematical ecology concentration.
2. Demonstrate proficiency in one foreign language, normally French, German or Russian. This requirement must be met prior to the examination in the area of specialization.

A student's doctoral committee may require the student to pass a second language examination.

3. Pass an examination in the field of specialization. After the requirements in 1. and 2. have been met, this examination will be given by a committee appointed by the department head. A student may take this examination only twice.

4. Pass the 600-level sequence in mathematics outside the student's area of specialization. The sequences selected to fulfill this requirement must be approved by the department head and the student's doctoral committee. (Such approval may occur after completion of the sequence.)

Requirements 1-4 must be completed no later than the start of a student's seventh year (as a mathematics graduate student at LIT).

Standard Program

Demonstrate knowledge in five subjects selected from the groups listed below by passing written examinations in three subjects and by earning grades of B+ or better each semester in the courses associated with two additional subjects. The three subjects selected for written examinations must be from Groups I, II, III. At least two groups must be represented in the three written examinations. At least three groups must be represented in the five subjects.


Mathematical Ecology Concentration

A student's five subjects may not include both Real Analysis and Applied Linear Analysis or both Mathematical Principles of Continuum Mechanics and Mathematical Principles of Fluid Mechanics. A student may not count examinations in both Ordinary Differential Equations and Partial Differential Equations, but both may be included in a student's five subjects. With prior approval of the graduate committee, a student may utilize a Group IV course a year-long graduate-level sequence from outside the Department of Mathematics. At most one such utilization may be made.

A student may take as many written examinations as desired at any time the examinations are given, subject to the following conditions:

1. The examinations to be taken must be approved in advance by the student's advisory committee.
2. At any one time a student may take at most only the number of examinations necessary to complete the requirements.
3. A student may take a maximum of 6 written examinations a maximum of 3 times, but no one failing 4 examinations, counting possible repetitions, will be permitted to take another examination. An exception is that a student who does not have a master's degree in mathematics and who has been enrolled in a UT graduate program in mathematics no longer than one year may take written examinations at one time during that year without having that sitting for the examinations or any incurred failure(s) count toward the limits in condition c.
4. At least two examinations must be taken and at least one must be passed before the start of a student's fourth year.
5. Three examinations must be passed before the start of a student's fifth year.
6. In lieu of examinations a B+ or better each semester in a sequence from Group I, II, III, a student may demonstrate proficiency in that subject by passing the associated written examination. For this purpose, only one examination is permitted for each of up to two subjects, and this use of a written examination must be declared before the examination is taken so that the sitting for the examination and any failure are not counted toward the limits in condition c.

Mathematical Ecology Concentration

The student must pass written examinations in three subjects:

2. A subject from Groups I, II, and III of the standard program.
3. A subject represented by a year-long graduate-level sequence from outside the Department of Mathematics. The sequence must be approved in advance by the mathematical ecology faculty and by the departmental Graduate Committee. At least one member of the mathematical ecology faculty must be involved in the grading of the examination. The examination in this subject may be taken only twice.
**Mechanical and Aerospace Engineering and Engineering Science**

(College of Engineering)

**MAJOR**

- **Aerospace Engineering**  
  M.S., Ph.D.
- **Engineering Science**  
  M.S., Ph.D.
- **Mechanical Engineering**  
  M.S., Ph.D.

D. W. Dareing, Head

**Professors:**

- Antar, B. (UTSI), Ph.D.  
  Texas
- Armilli, R. V., Ph.D.  
  VPI
- Baker, A. J., Ph.D.  
  New York
- Carley, T. G., Ph.D.  
  Illinois
- Caruthers, J. E. (UTSI), Ph.D.  
  Georgia Tech
- Collins, F. G. (UTSI), Ph.D.  
  California
- Crawford, R. A. (Emeritus) (UTSI), Ph.D.  
  Tennessee
- Dareing, D. W., Ph.D.  
  Illinois
- Edmondson, A. J. (Emeritus), Ph.D.  
  PE
- Engels, R. C. (UTSI), Ph.D.  
  VPI
- Flandro, G. A. (UTSI), Ph.D.  
  Cal Tech
- Forrester, J. H., Ph.D.  
  Iowa State
- Fortey, J. W. (Emeritus), Ph.D.  
  Toulouse (France)
- Franklin, J. I., Ph.D.  
  VPI
- Garrison, G. W. (UTSI), Ph.D.  
  NC State
- Hodgson, J. W. (Fisher Prof.), PE, Ph.D.  
  GE Tech
- Holland, R. W., Ph.D.  
  PE
- Jendrucko, R. J., Ph.D.  
  Virginia
- Johnson, W. S., Ph.D.  
  Clemson
- Keefer, D. R. (UTSI), Ph.D.  
  Florida
- Keyhani, M. (Liaison), Ph.D.  
  Ohio State
- Kim, K. H., Ph.D.  
  NC State
- Kranes, R. J., Ph.D.  
  Oklahoma
- Landres, J. D., Ph.D.  
  Lehigh
- Lee, C. W., (Emeritus), Ph.D.  
  IllinoisIT
- Lo, C. F. (UTSI), Ph.D.  
  Cornell
- McCoy, M. H. (UTSI), Ph.D.  
  Florida
- McCay, T. D. (UTSI), Ph.D.  
  Auburn
- Maxwell, R. L. (Emeritus), PE, M.S.  
  Case Western
- Merkle, C. L., Ph.D.  
  Princeton
- Milligan, M. W., PE, Ph.D.  
  Tennessee
- Parang, M., PE, Ph.D.  
  Oklahoma
- Parsons, J. R., PE, Ph.D.  
  NC State
- Peters, C. E. (Emeritus) (UTSI), Ph.D.  
  D.A.S.
- Pi, H. (Emeritus), PE, Ph.D.  
  IllionisIT
- Pitts, D. R. (Emeritus), Ph.D.  
  Georgia Tech
- Remenyik, C. J. (Emeritus), Ph.D.  
  Johns Hopkins
- Schulz, R. J. (UTSI), Ph.D.  
  Tennessee
- Scott, W. E. (Emeritus), Ph.D.  
  Johns Hopkins
- Shahroki, F. (UTSI), Ph.D.  
  Oklahoma
- Shobe, R. L. (Emeritus), PE, M.S.  
  Kansas State
- Smith, G. V., PE, Ph.D.  
  Penn State
- Snyder, W. T., Ph.D.  
  Northwestern

**Associate Professors:**

- Boulet, J. A. M., Ph.D.  
  Stanford
- Cezeaux, J. L., Ph.D.  
  Rensselaer
- Hamel, W. R., Ph.D.  
  Tennessee
- Hopkins, J. A. (UTSI), Ph.D.  
  Tennessee
- Iannelli, G. S., Ph.D.  
  Tennessee
- Kawiecki, G., Ph.D.  
  West Virginia
- Lyne, J. M., Ph.D.  
  NC State
- Madhukar, M. S., Ph.D.  
  Drexel
- Mathews, A., PE, Ph.D.  
  Illinois
- Moulden, T. H. (UTSI), Ph.D.  
  Colorado
- Nguyen, K., Ph.D.  
  VPI
- Riggins, D. W., Ph.D.  
  VPI
- Yu, N., Ph.D.  
  California

**Assistant Professor:**

- Pionke, C. D., PE, Ph.D.  
  Georgia Tech

Graduate programs leading to the degree of Master of Science and Doctor of Philosophy are available with majors in Mechanical Engineering, Aerospace Engineering, and Engineering Science. Changing from one of these programs to another requires departmental approval. Each applicant is advised as to any prerequisite courses before entering a program.

In Mechanical Engineering, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; thermodynamics; space engineering; gas dynamics; machine design; dynamics, control, and robotics; power generation; and stress analysis.

In Aerospace Engineering, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; thermodynamics; space engineering; gas dynamics; flight and aerospace mechanics; aeroacoustics; and structures and stress analysis.

In Engineering Science, program concentrations include solid mechanics, fluid mechanics, computational mechanics, mechanics of composite materials, applied artificial intelligence, biomedical engineering, industrial engineering (Ph.D. only), and optical engineering (UTSI only). In each of these concentrations, interdisciplinary programs are arranged to meet individual needs or interests. The flexibility and interdisciplinary aspect of the program concentrations are intended to be of particular interest to prospective students currently employed in research, development, or design activities and whose interests in continuing education (either full-time or part-time) lie at one of the interfaces between science and engineering or can best be met by interdisciplinary study in engineering. The program's course offerings and research activities are also intended to meet the needs of students who seek preparation for employment in engineering areas requiring specialization in mechanics or in related interdisciplinary studies such as biomechanics.

In Mechanical Engineering or Aerospace Engineering, entrance into the Master of Science program is available to qualified graduates of recognized undergraduate curricula in mechanical or aerospace engineering and to qualified graduates of other curricula who satisfy the necessary prerequisites. A program application is required in addition to the Graduate School application. Admission into the doctoral program will be granted to those applicants who have demonstrated superior achievement in their engineering backgrounds. The general GRE is required of all international applicants for admission.

In Engineering Science, entrance into the graduate program is available to graduates of recognized curricula in engineering, mathematics, or one of the physical or biological sciences. A program application is required in addition to the Graduate School application. The names and addresses of four references must be included with the program application. The general GRE is required of all international applicants for admission.

Each student must satisfactorily complete a program of study that has been approved by his/her advisory committee and complies with the requirements of the Graduate School. In Engineering Science, the student's major professor may be selected from a department other than the Department of Mechanical and Aerospace Engineering and Engineering Science; however, at least one member of the student's graduate advisory committee must be on the faculty of the Department of Mechanical and Aerospace Engineering and Engineering Science.

**THE MASTER'S PROGRAM**

In Mechanical Engineering, Aerospace Engineering, and Engineering Science, two M.S. options are offered. Option I requires a thesis and is the normal program for graduate students. Option II does not require a thesis and provides graduate students, including co-op and off-campus students, the opportunity to focus their programs in special areas through extended coursework.

Credit requirements for these two options in Mechanical Engineering and Aerospace Engineering are:

<table>
<thead>
<tr>
<th>Course Areas</th>
<th>Hours Required</th>
<th>Option I</th>
<th>Option II</th>
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<tr>
<td>Thesis credit</td>
<td>6</td>
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<td>n/a</td>
</tr>
<tr>
<td>Coursework</td>
<td>24</td>
<td>30</td>
<td>12</td>
</tr>
</tbody>
</table>

**Courses in program** (500-level or above) (min.):

- Mathematics (400-level or above) 6
- 590 Selected Engineering Problems (max.) 6

**Total** 30 30
THE DOCTORAL PROGRAM

All students must complete a minimum of
72 semester hours beyond the Bachelor’s
degree, exclusive of credit for the master’s
thesis. These shall include a minimum of 24
semester hours in Doctoral Research and
Dissertation and a minimum of 48 semester
hours in other courses.

In Mechanical Engineering or Aerospace
Engineering, the courses must include:
1. A minimum of 12 semester hours of
graduate credit in mathematics in courses
numbered 400 or above and a minimum of 6
semester hours numbered 500 or above.
2. A minimum of 24 semester hours in
the department in courses numbered 500 and
above, with at least 12 of these semester
hours in the major. A minimum of 9 semester
hours of courses is required at the 600 level.
These are exclusive of thesis, problems, or
dissertation credit. The student’s advisory
committee can approve a student’s petition
to replace one 600-level course with one or
more 500-level courses(s) that are more
appropriate.

In Engineering Science, the courses must include:
1. A minimum of 24 semester hours in
engineering graduate courses, exclusive of
thesis and dissertation credit. These courses
will normally be numbered 500 and above,
with at least 9 semester hours of 600-level
courses, which constitute one or two areas
of concentration selected by the student. The
number of courses in this group to be taken
will depend on the program selected by the
student and the approval of his/her advisory
committee.
2. A minimum of 12 semester hours in
mathematics or computer science in courses
numbered 400 and above, exclusive of a first
course in ordinary differential equations.

Additional requirements for all students include:
1. Registration and participation in the
graduate seminar in the major program.
2. Meet all departmental examination
requirements, which include passing a written
and oral comprehensive examination.
3. Presentation of a dissertation proposal
to the student’s advisory committee and
approval of that proposal by that committee.

ACADEMIC COMMON MARKET

An agreement among southern states for
sharing graduate programs allows legal
residents of some states to enroll in certain
programs at UT on an in-state tuition basis.
The M.S. program in Aerospace Engineering
is available to residents of the state of South
Carolina. Additional information may be
obtained from the Admissions Specialist in
the Office of Graduate Admissions and
Records.

GRADUATE CREDIT FOR UNDERGRADUATE COURSES

Students majoring in Mechanical Engineer-
ing or Aerospace Engineering may not
usually use more than one 400-level
engineering course to meet their advanced
degree requirements. For students majoring
in Engineering Science, four hundred-level
courses in engineering may be used for
graduate credit at the discretion of the
advising committee. However, at least two-
hirds of minimum required credit hours in a
master's degree program must be at or
above the 500 level. With the approval of
the student's major department, a student whose
major is outside the Department of Mechanical
and Aerospace Engineering and
Engineering Science may take senior (400-
level) courses in the Department for graduate
credit. Such students should consult with
instructors regarding prerequisites for
undergraduate courses.

Aerospace Engineering

NOTE: Not all the courses listed below are available
at both the UT and the UTSI campuses.

GRADUATE COURSES

422 Aerodynamics (3) Theory and design of
aerodynamic bodies for desired characteristics. Potential
flow theory, viscous effects, compressibility effects.
Subsonic, transonic, and supersonic airfoils. Prereq:
351 Compressible Flow, 370 Airplane Performance. F
424 Astronautics (3) Spacecraft design, propulsion,
mission planning, satellite and space flight, spacecraft
operation, current topics. Prereq: 351 Compressible Flow.
434 Heat Transfer. F
425 Propulsion (3) Principles of propulsion devices:
turbojet, ramjet and rocket engines. Prereq: 351. F
426 Introduction to Aerospace Design (3) Design
process, synthesis, safety, reliability, optimization,
aircraft aerodynamics, space vehicles, satellites. Prereq:
351, 370, 363. Core: Mechanical Engineering 444. F
429 Aerospace System Design (4) Synthesis and
design of complete aerospace system, economic and
technical aspects. Participation in team design effort,
formal presentations and design report. Prereq: 424, 425, 426. Sp
440 Aerospace Engineering Laboratory (3) Design,
conducting, and reporting results of experi-
mental exercises. Text standards and specifications.
Analysis of data and formulation of conclusions. Prereq:
345 Aerospace Engineering Instrumentation and Measure-
ment. 351 Compressible Flow, 425, 3 labs. F
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Re-
quired for the student not otherwise registered during
any semester when student uses University facilities
and/or faculty time before degree is completed. May
not be used toward degree requirements. May be
repeated, S/N only. E
511 Inviscid Flow (3) Kinematics and dynamics of
inviscid fluids; potential theory. Prereq: Mathematics 425
or equivalent.
512 Viscous Flow (3) Determination of fundamental
estimates of solutions for viscous, heat-conducting flow:
estating selection of Newtonian viscous flow (Navier-
Stokes) equations for special cases; similarity solutions.
Thermodynamic states, laminar boundary flows, tran-
sition to turbulence, boundary layer flows, turbulence
and transition, turbulent boundary layer equations.
Incompressible-turbulent mean flow, and
compressible boundary layer flow. Prereq: Consent of
Instructor.
513 Experimental Methods in Fluid Mechanics (3) Experi-
nmental techniques with laboratory experiments;
representative experiments: hot wire anemometry and
turbulence measurement; computational fluid dynamics;
wind tunnel models, fluid visualization, wind tunnel
tests, water table experiments, spray flows, boundary
layer measurements, laser-optical measurements.
Prereq: 423 Fluid Flow or 541.
515-16 Air Vehicle Aerodynamics and Performance (3,3)
Application of aerodynamic principles to aircraft,
launch vehicle and spacecraft design. Prereq: 511, 512.
Thrust, lift, drag, and stability, propulsion system
performance, aircraft and spacecraft performance
characteristics, and trajectory optimization. Prereq:
423 Fluid Flow or 541.
521-22 Aerodynamics of Compressible Fluids (3,3)
One-dimensional internal flow, boundary layer flow,
viscous flow, slender body theory; similarity
rules, method of characteristics. Prereq: 423 for 521; 522
for 522.
525 Hypersonic Flow (3) Viscid and inviscid
flows, altitude, flow control applications; free molecule
flow and rarefied gas flow. Prereq: 512.
527-28 Aerodynamics and Ground Test Facilities (3,3)
Atmospheric models and instrumentation; aerody-
namic test facilities; computerized instrumentation.
Wind tunnels and ballistic ranges; propulsion test
facilities; experimental data; rocket engines. Prereq:
511, 512, 541 and Mechanical Engineering 522.
529 Rarefied Gas Dynamics (3) Rarefied gases.
Langevin and Boltzmann models, and equation of
state. Prereq: 511, 512, 541, and one of Mechanical
Engineering 423 or 522.
531 Magnetohydrodynamics (3) Electromagnetic
field theory, chemical kinetics, thermodynamic
and thermophysical properties of gas plasmas; governing
equations and their applications. Prereq: 422 and
Mathematics 471.
532 Introduction to Turbulence (3) Microscopic
effects, anisotropy, symmetries, correlation
functions, energy spectra, diffusion; application
of turbulent jets and pipe flow. Prereq: 511-12.
533 Dynamics (3) (Same as Mechanical Engineering
533) (Same as Engineering Science 533.)
534 Fluid Dynamics (3) (Same as Mechanical
Engineering 534 and Engineering Science 534.)
535 Atmospheric Entry (3) Atmospheric entry
trajectories; slowness and stability during reentry,
aerodynamics and thermal protection systems. Prereq:
522, Recommended prereq: 512.
536 Mechanical Vibrations (3) (Same as Mechanical
Engineering 536 and Mechanical Engineering 536.)
539 Continuum Mechanics (3) (Same as Engineering
Science 539 and Mechanical Engineering 539.)
442 Fluid Mechanics II (3) Integrals form of linear and angular momentum equations and applications to pumps and turbomachinery; performance similarity; similarity transformations; conservation equations, internal one-dimensional incompressible and compressible flows; potential flow; methods of flow measurement; laboratory. Prereq: Fluid Mechanics I, Differential Equations I, Calculus III, Sp.

465 Dynamic Data Acquisition (3) Use and calibration of instrumentation for measuring and recording dynamic events; Fourier analysis, transfer function analysis, digital signal processing, transient analysis, experimental parameter estimation, and applications to modal vibration analysis. Prereq: Circuits and Electro Magnetic Fields I, Components, Mechanical Vibration. 2 hrs and 1 lab.

475 Design of Artificial Internal Organs (3) Design, development, and evaluation of artificial internal organs: analysis of transport processes in therapeutic design and tissue life optimization; review of currently available devices; federal regulations and ethical considerations. Prereq: 341, Mathematics 231.

494-85 Special Engineering Science Topics (1-3, 1-3) Problems related to recent developments and practices. Open to juniors or seniors. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or for a term before degree is completed. May not be used toward degree requirements. Prereq: Consent of instructor. May be repeated. S/NC only. E

521-22 Advanced Strength of Materials (3,3) (Same as Mechanical Engineering 535-36 and Aerospace Engineering 552-53.)

523 Theory of Elasticity (3) Equations of equilibrium; strain-displacement compatibility; and constitutive equations in three-dimensions. Beams, columns, thick-walled tubes, plates with holes; stress concentrations; Aoy and complex potential stress function, plane stress and plane strain in rectangular and polar coordinates. Thermal stresses in beams, rings, plates, and shells; thermal buckling problems.

525 Theory of Plates (3) Classical bending theory of thin plates and buckling and large deflection problems. Coreq: 553.


528 Ceramic Matrix Composites: Material and Mechanics (3) Microcrack and multiscale structural design; fabrication of ceramic matrix composites; interfacial characterization and mechanical properties; electron microscopy; fabrication; nondestructive evaluation; fracture; fatigue; and applications. Prereq: Consistent with instructor. (Same as Materials Science and Engineering 528.)

529 Fatigue of Engineering Materials (3) Fatigue life prediction, crack initiation, crack propagation. Variables fracture toughness, cleavage, and delamination, environmental fatigue, creep fatigue, metallurgical and microstructural variables, fractography, non-metals. Prereq: Consent of instructor.

533 Dynamics (3) (Same as Mechanical Engineering 533 and Aerospace Engineering 533.)

534 Mechanical Vibrations (3) (Same as Mechanical Engineering 534 and Aerospace Engineering 534.)

536 Advanced Engineering Acoustics (3) Introduction to theory and application of acoustic analysis; vibration of continuous systems, plane and spherical waves, transmission phenomenon, radiation and scattering.
539 Continuum Mechanics (3) Cartesian tensors, transformation equations, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics. (Same as Aerospace Engineering 539 and Mechanical Engineering 539.)

541 Fluid Mechanics I (3) (Same as Mechanical Engineering 541 and Aerospace Engineering 541.)

542 Fluid Mechanics II (3) (Same as Mechanical Engineering 542 and Aerospace Engineering 542.)

551 Elements for Engineering Applications (3) Computational procedures for differential equation statements in engineering sciences. Approximation, boundary conditions, error determination, finite element implementations; comparison to legacy finite difference methods. Applications in 1, 2, and 3 dimensions, non-linear, steady and unsteady problems, coupled equations. Examples from diverse technical fields; fluid mechanics, heat transfer, mass transfer, elasticity, electron transfer and related systems. Computer projects. Prereq: Bachelor's degree in engineering or natural science. (Same as Aerospace Engineering 561 and Mechanical Engineering 571.)


553 Computational Solid Mechanics (3) Finite element techniques, mechanical mechanics and linear elasticity. Two and three-dimensional formulations; isoparametric elements, numerical quadrature. Equation solving, matrix iteration techniques. Applications in beams, plates and shells; use of representative computer programs in PC and networked UnicAD solids modeler. Prereq: 321 Mechanics of Materials I or equivalent. (Same as Aerospace Engineering 563 and Mechanical Engineering 573.)


556 Optical Engineering I (4) Wave optics; scalar diffraction theory; introduction to Fourier optics; ray or geometric optics; lens, mirror, gratings, paraxial design methods; introduction to aberrations.

558 Optical Engineering II (4) Statistical optics; spontaneous and induced emission; black and gray body radiation; radiation from a point source, partial and totally coherent radiation; mutual coherence function; detectors; radiometry. Prereq: 566.

571 Biomechanics of Hard and Soft Tissue (3) Introduction to terminology, physiology, and analytical methods for mechanical systems. Fundamental concepts of solid mechanics. Analysis of biological tissues and biological fluids. Flow properties of blood, rheology of blood in micro vessels, bioviscosity behavior of fluids and solids, mechanical properties of blood vessels; skeletal, heart and smooth muscle; bone and cartilage. Research paper.


576 Expert Systems in Engineering (3) (Same as Nuclear Engineering 579 and Mechanical Engineering 576.)

577 Neural Networks in Engineering (3) (Same as Nuclear Engineering 577 and Mechanical Engineering 577.)

578 Fuzzy Systems in Engineering (3) (Same as Nuclear Engineering 578.)

581 Special Topics in Engineering Mechanics (3) Mechanics problems related to recent developments. Prereq: Consent of instructor. May be repeated with consent of department.

585 Industrial Pollution Prevention (3) (Same as Chemical Engineering 581 and Environmental Engineering 581.)

590 Selected Engineering Problems (2-5) Enrollment limited to students in engineering program. Prereq: Consent of advisor. May be repeated. Maximum 6 hrs. S/NC only.

595 Seminar (1) All phases of science or engineering. May be repeated. S/NC only.

600 Doctoral Research and Dissertation (3-15) P/NP only.

624 Viscoelasticity (3) Viscoelastic constitutive relations; isothermal boundary value problems; wave propagation in viscoelastic materials; stability problems; determination of viscoelastic properties. Prereqs: 523, and 539 or Materials Science and Engineering 541.

625 Computational Plasticity and Creep (3) Theory and numerical algorithms used to describe plastic and creep behavior in finite element structural models. Perfect plasticity, kinematic and isotropic hardening; Mroz, mechanical sublayer, and two-surface models; volumetric plasticity models; traditional creep models and unified creep-creep models. Numerical algorithms, including error maps and finite element plasticity algorithms in parallel. Prereq: 539 or 523, 533.


633 Vibrations (3) Free and forced vibration of strings, beams, membranes, plates and shells. Proportion, artificial dissipation mechanisms. Two and three-dimensional, compressible viscous and inviscid flows; potential, Euler and complete Navier-Stokes descriptions; turbulence closure models, reacting flows; mixed subsonic-supersonic. Computer projects, production software. Prereq: 551, 552. (Same as Aerospace Engineering 651-52 and Mechanical Engineering 651-82.)


567 Computational Mechanics Seminar (1) Current developments in computational fluid/thermal/structural mechanics. For departmental thesis students only. May be repeated.

571 Advanced Topics in Applied Artificial Intelligence (3) (Same as Nuclear Engineering 671 and Mechanical Engineering 671.)

681 Advanced Topics in Engineering Mechanics (3) Advanced problems in mechanics, group individually. Prereq: Consent of instructor. May be repeated with consent of department.

NOTE: Not all the courses listed below are available at both the UT and the UTSI campuses.

GRADUATE COURSES


451 Systems and Controls (3) Analytical models of physical systems comprised of combinations of mechanical, fluid, electrical and thermal components; feedback control systems; transient and frequency response, stability analysis; non-linear control of linear systems; sampled data systems, digital filters. Prereq: Mechanical Engineering 451 or Consent of Instructor. Measurements, Circuits and Electro Mechanical Components.

452 Introduction to Design (2) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering thermal-fluid system. Participation in team design effort; design report. Prereq: 332, 344, F.


471 Refrigeration and Air Conditioning (3) Vapor compression refrigeration and heat pump systems; psychrometric processes; air-washers and floor coolers; solar radiation; building heat transmission. Prereq: Consent of Instructor. 3 labs. F,Sp.

475 Thermal Engineering (3) Thermal systems: turbomachinery, heat exchangers, combustion and system analysis and design, second law and economic analysis. Prereq: 332, 344, F,Sp.


500 Doctoral Research and Dissertation (3-15) P/NP only.

595 Seminar (1) All phases of science or engineering. May be repeated. S/NC only.

685-52 Advanced Topics in Computational Fluid Dynamics (3,3) Modern approximation theory for non-linear Navier-Stokes and Euler systems. Algorithms for compressible flows; finite element, finite volume; accuracy, convergence, stability, smooth and non-smooth solutions; shock-capturing schemes. Two and three-dimensional, compressible viscous and inviscid flows; potential, Euler and complete Navier-Stokes
Metallurgical Engineering
See Materials Science and Engineering

Microbiology
(College of Arts and Sciences and College of Veterinary Medicine)

MAJOR

Microbiology ........................................ M.S., Ph.D.
Veterinary Medicine .................................... D.V.M.

Robert Moore, Head

Professors:
Beck, Raymond W. (Emeritus), Ph.D............ Wisconsin
Becker, Jeffrey M., Ph.D............. Cincinnati
Brian, D. A., Ph.D., D.V.M............. Michigan State
Monte, T. C. (Emeritus), Ph.D............. Maryland
Moore, R. N., Ph.D......................... Texas
Riggby, W. Stuart, Ph.D..................... Yale
Rouse, B. T., Ph.D......................... Guelph
Savage, Dwayne C. (Emeritus), Ph.D........... California
Sayler, Gary S., Ph.D......................... Idaho
Stacey, G. (Lakson), Ph.D.................... Texas
White, D. C. (Distinguished Scientist), Ph.D................ Rockefeller
Woodward, J. M. (Emeritus), Ph.D.............. Kansas

Associate Professor:
Hacker, David, Ph.D......................... Michigan State

Assistant Professors:
Wilhelm, Steve, Ph.D......................... Western Ontario
Zaghouni, Habib, Ph.D........................ Paris

The Department of Microbiology offers both the M.S. and Ph.D. Students have the option of selecting from a variety of graduate research programs. For a departmental brochure, contact the department head.

ADMISSION REQUIREMENTS

Students are expected to have completed an undergraduate program with a 3.0 or better GPA on a 4.0 system. Included in the undergraduate course credits should be (1) a full year of general biological science, (2) one year of organic, (3) three years of chemistry, including one of inorganic, (4) one year of physics, and (5) an introductory course in microbiology. In many cases, deficiencies in requirements may be removed by taking appropriate courses during the first year of graduate study. The department also requires the general portion of the Graduate Record Examination. A satisfactory score on each part is 550 or higher with rare exceptions. Three letters of recommendation should be submitted by current or former faculty members.

Each new graduate student meets with an advisory committee chaired by the departmental Director of Graduate Studies to plan a program of study for the first one or two semesters until a research advisor is selected. All first-year students participate in a laboratory rotation program during the first semester of study. This program allows the student to adjust smoothly to the research programs of the department, to develop a background of research procedures and concepts, and to facilitate the selection of a research professor. Usually the student selects a research professor toward the end of the laboratory rotation period. The major professor assists in the selection of and carries out of a suitable research program and in the naming of a thesis or dissertation committee.

THE MASTER'S PROGRAM

The program leading to the M.S. is designed to provide the student with broad basic knowledge, to permit the acquisition of technical competence in the fundamentals of research, and to encourage creative and independent thinking. Two to three calendar years are usually required for the course of study that has the following requirements: (1) 30 hours including 6 thesis credits; (2) a 3.0 GPA in all courses taken for graduate credit after 12 hours of credit have been earned in courses graded on the A-F system; (3) a 3.0 GPA in courses taken in the department; (4) a complete course sequence in biochemistry or molecular biology; (5) presentation of a research thesis and its oral defense.

THE DOCTORAL PROGRAM

The program leading to the Ph.D. is designed to develop the student's ability to pursue independent and original research in microbiology and allied fields, to teach both oral and written communication of the results of research to the scientific community, and to train effective teachers. Students may enter the program after receiving either a bachelor's or master's degree. Students who enter with a bachelor's degree usually receive the Ph.D. after four or five years; those with the master's degree usually take three to five years to complete the degree. Departmental requirements are: (1) a 3.0 GPA in all courses taken for graduate credit after 12 hours of credit have been earned in courses graded on the A-F scale; (2) a 3.0 GPA in courses taken in the department; (3) satisfactory performance in at least one semester as a teaching assistant; (4) one semester of physical chemistry; (5) one course in statistics; (6) two seminars of biochemistry or molecular biology; (7) satisfactory performance in a comprehensive examination that must be attempted before the end of the fifth semester in the program and passed before admission to candidacy; and (8) the presentation of a research dissertation and its oral defense.

GRADUATE COURSES

410 Bacterial Physiology (3) Modern concepts of structure and function of bacterial cell. Prereq: Introduction to Microbiology. F
411 Bacterial Genetics (3) Transmission and expression of genetic information by bacteria. Prereq: Introduction to Microbiology. Sp
420 Medical Microbiology (3) Disease-producing microorganisms, including bacteria, rickettsia, chlamydia and fungi. Prereq: Introduction to Microbiology. Sp
429 Medical Microbiology Laboratory (2) Laboratory exercises in medically important areas of microbiology: microorganisms, pathogenesis and immunology. Prereq: Introduction to Microbiology Lab. 430. Coreq. 420. Sp
430 Immunology (3) Principles of inflammation and immunity; immunoglobin structure and theories of formation and diversity; complement, hypersensitivities, cell cooperation and recognitions in immune mechanisms; soluble factors. Prereq. General Genetics. F
470 Microbial Ecology (3) Physiological diversity and taxonomy of microorganisms from natural environments. Functional role of microorganisms in natural and simulated ecosystems. Prereq. 310. F
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
575 Applied Microbiology and Bioengineering (3) (Same as Chemical Engineering 575, Environmental Engineering 575, and Biosystems Engineering 575.)
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.
595 General Seminar (1) Lectures and seminars by invited speakers, faculty, and graduate students. May be repeated. Maximum 18 hrs. S/NC only. E
596 Laboratory Rotation (1) Familiarization with research area in department through series of rotations in laboratories of individual faculty members. May be repeated. Maximum 3 hrs. S/NC only. E
600 Doctoral Research and Dissertation (3-15) P/NP only. E
601 Journal Club in Microbial Physiology (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only. E
602 Journal Club in Microbial Pathogenesis (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only. E
603 Journal Club in Immunology (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only. E
604 Journal Club in Virology (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only. E
605 Journal Club in Microbial Genetics (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only. E
606 Journal Club in Microbial Pathogenesis (1) Prereq: 410 or consent of instructor. May be repeated. Maximum 12 hrs.
620 Topics in Microbial Genetics (1-3) Prereq: 420, 430 or consent of instructor. May be repeated. Maximum 12 hrs.
630 Topics in Immunology (1-3) Prereq: 430 or consent of instructor. May be repeated. Maximum 12 hrs.
640 Topics in Virology (1-3) Prereq: 440 or consent of instructor. May be repeated. Maximum 12 hrs.
650 Topics in Microbial and Molecular Genetics (1-3) Prereq: 570 or consent of instructor. May be repeated. Maximum 12 hrs.
660 Topics in Environmental Microbiology (1-3) Prereq: 570 or consent of instructor. May be repeated. Maximum 12 hrs.
670 Advanced Topics in Environmental Microbiology (1-3) Prereq: 570 or consent of instructor. May be repeated. Maximum 12 hrs.
Microbiology-Veterinary Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

Modern Foreign Languages and Literatures

(College of Arts and Sciences)

MAJORS DEGREES

French ............................................. M.A.
German ........................................... M.A.
Spanish ........................................... M.A.
Modern Foreign Languages ............... Ph.D.

Carolyn R. Hodges, Head

Professors:

Barrette, Paul E., Ph.D. .................. California
Brady, Patrick (Shumway Chair of Excellence), D.U.P. .......... Sorbonne
Campion, Edmund J., Ph.D. ......... Yale
Cobb, Carl W. (Emeritus), Ph.D. ...... Tulane
Elliott, Jacqueline C. (Emerita), M.A. ....... Illinois
Faleri, James E. (Emeritus), Ph.D. .... Pennsylvania
Fiene, Donald M. (Emeritus), Ph.D. ...... Indiana
Handelman, Michael H., Ph.D. ......... Florida
Heftin, William H., Ph.D. ................... Florida State
Hodges, Carolyn R., Ph.D. ............... Chicago
Irving, Thomas B. (Emeritus), Ph.D. ... Princeton
Kratz, Henry (Emeritus), Ph.D. .......... Ohio State
Levy, Karen D., Ph.D. ....................... Kentucky
Maurino, Ferdinando D. (Emeritus), Ph.D. .... Columbia
Mellor, C. J., Ph.D. ......................... Chicago
Osborne, J. C. (Emeritus), Ph.D. ......... Northwestern
Pinsky, Clara (Emerita), Ph.D. .......... California
Ritzenhoff, Ursula C. (Emerita), Ph.D. .... Connecticut
Rivera-Rodas, Oscar, Ph.D. ............. California
Romeiser, John B. (Liaison), Ph.D. .... Vanderbilt
Vazquez-Bigl, A. M. (Emeritus), Ph.D. .... Minnesota
Wallace, Albert H. (Emeritus), Ph.D. .... North Carolina
Washburn, Yulan M., Ph.D. ............. North Carolina

Associate Professors:

Beaupio, Margaret, Ph.D. ................. Texas
Brizio-Skov, Flavia, Ph.D. ............... Washington
Creel, Bryant, Ph.D. ......................... California
DiMaria, Salvatore, Ph.D. ............... Wisconsin
Holmlund, Christine, Ph.D. ............. Wisconsin
LaCure, Jon, Ph.D. ......................... Indiana
Lauckner, Nancy A. (Liaison), Ph.D. .... Wisconsin
Lee, David E., Ph.D. ....................... Stanford
Nakama, Constacio, Ph.D. .............. Sorbonne
Pervukhina, Natalia K., Ph.D. .......... Bryn Mawr
Young, Dolly, Ph.D. ....................... Texas

Assistant Professors:

Blackwell, Stephen H., Ph.D. .......... Indiana
Cruz-Camara, Nuria, Ph.D. ........ SUNY (Buffalo)
Essif, Lea, Ph.D. ......................... Brown
Hoang, Peter, Ph.D. ....................... Wisconsin
Kapian, Gregory, Ph.D. .............. Pennsylvania
Maxim, Hiram H., Ph.D. ............. Texas
McAlpin, Many K., Ph.D. ............ Columbia
Ohsorg, Stefanie, Ph.D. .............. McGill
Silva-Filho, Euro, Ph.D. .............. North Carolina
Williams, Junko, Ph.D. .............. Ohio State
Yim, Chi-hung, Ph.D. ..................... Yale

The Department of Modern Foreign Languages and Literatures offers graduate programs leading to the Master of Arts degree with majors in French, German and Spanish, and the Doctor of Philosophy degree with a major in Modern Foreign Languages. Inquiries should be addressed to the head of the department.

THE MASTER'S PROGRAMS

French

Thesis Option:

1. Completion of a minimum of 24 semester hours in coursework plus at least 6 hours in course 500 Thesis. French 501 is required. A maximum of 6 hours may be taken at the 400 level, the rest at the 500 level, and under certain conditions the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours (including 6 hours of thesis) must be taken in the major, 6 in the minor.
2. A thesis, with a minimum of 6 semester hours in course 500.
3. A written examination covering the coursework and selected items from a master reading list.
4. A final oral examination covering the thesis.

Non-Thesis Option:

1. Completion of at least 30 semester hours, with a maximum of 9 at the 400 level, the rest at the 500 level, including French 501. Under certain conditions, the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours must be taken in the major, 6 in the minor.
2. Three term papers that have been accepted by the student's advisory committee.
3. A written examination covering the coursework and selected items from a master reading list.
4. A final oral examination to discuss the papers.

German

Thesis Option: The minimum requirements are 24 semester hours of coursework and 6 hours of Thesis 500. German 510 and 519-20 are required, as are three courses on German literature or culture, one of which may be at the 400 level. In addition, students must take three further courses, one of which may be chosen from 411-12 or 485. All graduate teaching assistants should take 512, and other candidates may take 512 or any other course above 500. A maximum of three 400-level courses may be counted toward the 24 semester hours of course credit. All M.A. candidates must sit for a standardized language examination, such as the Zentrale Mitteilenprüfung. Students who are interested in future Ph.D. level study are strongly advised to choose the thesis option.

Non-Thesis Option: The minimum requirements are 30 semester hours of coursework, including at least one 600-level course, for which a seminar paper is required. German 510 and 519-20 are required, as are three courses on German literature or culture, one of which may be at the 400 level. In addition, students must take three further courses, only one of which may be chosen from 411-12 or 485. All graduate teaching assistants should take 512, and other candidates may take 512 or any other 500-level course. A maximum of three 400-level courses may be counted toward the 30 semester hours of coursework. A common written exam over the designated reading list is required, as is a standardized language exam, such as the Zentrale Mitteilenprüfung. Each non-thesis M.A. candidate will have a committee of three faculty members in German to whom the student will submit a dossier consisting of the seminar paper and one paper previously submitted in a graduate course. The length and type of the papers is described in greater detail in the Manual for Graduate Students in German.

Spanish

Thesis Option:

1. Completion of a minimum of 24 semester hours in coursework plus at least 6 hours in course 500 Thesis. Spanish 550 is required. A maximum of 6 hours may be taken at the 400 level, the rest at the 500 level, and under certain conditions the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours (including 6 hours of thesis) must be taken in the major, 6 in the minor.
2. A thesis, with a minimum of 6 semester hours in course 500.
3. A written examination covering the coursework and selected items from a master reading list.
4. A final oral examination covering the thesis.

Non-Thesis Option:

1. Completion of at least 30 semester hours, with a maximum of 9 at the 400 level, the rest at the 500 level, including Spanish 550. Under certain conditions, the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours must be taken in the major, 6 in the minor.
2. Three term papers that have been accepted by the student's advisory committee.
3. A written examination covering the coursework and selected items from a master reading list.
4. A final oral examination covering the thesis.

THE DOCTORAL PROGRAM

The Ph.D. in Modern Foreign Languages requires advanced training in a major language and either a second language or applied linguistics.
Admission Requirements

Applicants must have completed a B.A. in either French, German or Spanish to be accepted into this program. Both graduates of institutions in the United States and those with undergraduate degrees from institutions outside the United States must have a grade point average of at least 3.0. Consideration will also be given to applicants who do not have an undergraduate degree in one of the three foreign languages but do have the equivalent of an undergraduate major in one of them.

Degree Requirements

Candidates must complete a minimum of 63 semester hours of coursework beyond the bachelor’s degree in addition to 24 hours of doctoral research and dissertation. For candidates with French or Spanish as a first concentration, two tracks are available:

The coursework for Track I must be distributed as follows: at least 39 hours in the first concentration; at least 18 hours in the second concentration; and at least 6 hours in a cognate field.

The coursework for Track II must be distributed in this way: at least 45 hours in the first concentration; at least 12 hours in the second concentration; and at least 6 hours in a cognate field. Because Track II students will have taken 12 graduate hours instead of 18 hours in the second concentration, they will normally not be eligible to teach that field at institutions which follow DACS guidelines for college foreign language teaching.

The coursework for all concentrations must be distributed as follows:

1. First Concentration: German. A minimum of 39 hours of German courses beyond the bachelor’s degree, distributed as follows: 400 level: A maximum of 6 hours of 400-level classes taken for the M.A. may be applied. 500 level: A minimum of 12 hours must be taken. These must include German 512, 519, 520, and 560. Thesis hours are excluded. If 512 is used as part of a second concentration in applied linguistics, another course must be substituted in the first concentration. 600 level: A minimum of 12 hours must be taken, exclusive of dissertation hours.

First Concentration: French or Spanish. A minimum of either 39 (Track I) or 45 (Track II) hours of French or Spanish courses beyond the bachelor’s degree, distributed as follows: 400 level: A minimum of 6 hours of 400-level classes taken for the M.A. may be applied. 500 level: A minimum of 21 hours must be taken. These must include French 512, 516, 519, 584 or Spanish 512 and 550. Thesis hours are excluded. If 512 is used as part of a second concentration in applied linguistics, another course must be substituted in the first concentration. 600 level: A minimum of 12 hours must be taken, exclusive of dissertation hours.

2. Second Concentration: A minimum of 18 (German or Track I) or 12 (Track II) hours beyond the bachelor’s degree, taken in the field of applied linguistics or in a second language, either French, German, Italian, Portuguese (Track II only), Russian or Spanish. For Track I and German, 12 of these hours must be at the 500 level or above. For Track II, 3 of these hours must be at the 500 level or above.

French students choosing applied linguistics must take French 421 or 429; 425; 512; and 9 (Track I) or 3 (Track II) hours of appropriate electives in English or French. German students choosing applied linguistics must take German 425, 425, 510, or 512, 3 hours of German linguistics, such as 426, 436, 631, or 632, and 6 hours of linguistics electives in English or German. Spanish students choosing applied linguistics must take Spanish 421 or 429; 425; 512; and 9 (Track I) or 3 (Track II) hours of appropriate electives in English or Spanish. The student’s graduate advisor must approve the electives chosen.

3. Cognate Field. Six hours in graduate courses numbered 400 and above in a field outside the department or language family of the first concentration but related to the student’s principal area of research. Students choosing applied linguistics as a second concentration are strongly urged to take their cognate work in a second language.

4. Additional requirements: For any languages taken as a first or second concentration, a student must demonstrate competence by taking a test. The test will include reading, writing, listening, and speaking and should be completed by the time the student reaches 40 hours of study beyond the bachelor’s degree. Standardized examinations that may be used for this purpose include applicable portions of either the National Teacher Examination, the MLE Examination for Teachers and Advanced Students, or the proficiency standards of the United States Foreign Service Institute (FSI). If a student has not chosen a third language as his or her cognate area, basic competence (determined by a reading examination with translation into English administered by the department) in a third language is required. If the student’s first and second languages are Romance languages, the third language should be chosen from another language family.

For students choosing applied linguistics as an area of second concentration, reading competence in a second language is required. Competence will be determined by translation of a text from the foreign language into English, the test to be administered by the department.

A comprehensive examination on the language and literature of the first and second concentrations must be passed before the student may be admitted to candidacy. The candidate is required to defend his/her dissertation in an oral examination. Central emphasis is put on the doctoral dissertation as a final test of the candidate’s scholarly qualifications.

Graduate Teaching Assistants with a second concentration in another language should have the opportunity and will be strongly encouraged to instruct in the languages of both their first and second concentration, subject to staffing needs. Doctoral students are strongly encouraged to reside and study abroad and will be assisted in identifying potential sources of financial support (e.g., Fulbright, McCube, Rotary fellowships).

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The Ph.D. program in Modern Foreign Languages is available to residents of the state of Alabama. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Asian Languages

GRADUATE COURSES

431 Readings in Chinese Literature (3) Prereq: Mastery of intermediate-level Chinese or consent of instructor. May be repeated. Maximum 9 hrs.

451 Readings in Japanese Literature (3) Prereq: Mastery of intermediate-level Japanese or consent of instructor. May be repeated. Maximum 9 hrs.

French

GRADUATE COURSES


411 French Literature of the 16th Century (3) Highlights of 16th-century French literature. Excerpts from Flaubert and Gide, readings of poems from writers from Lyon and southern France, etc. Prereq: 300-level literature course.


413 French Literature of the 18th Century (3) Major works of Enlightenment. Prereq: 300-level literature course.

414 French Literature of the 19th Century (3) Major works of Realism, Naturalism and Naturalism. Prereq: 300-level literature course.


416 Survey of Francophone Literature (3) Examination of French literature outside metropolitan France, particularly Africa and Caribbean. Prereq: 300-level literature course.

420 French Cinema (3) French cinema from earliest days through New Wave directors. Prereq: 300-level literature course. May apply toward major.

421 Phonetics (3) Foundation in science of phonetics. Practical exercises and individual performance. Laboratory training highly recommended. Graduate credit not allowed for departmental majors. Prereq: Intermediate Composition and Conversation or equivalent.

422 Advanced Grammar (3) Improving one's written French by studying basic and more refined structures of French language. Writing creative free-style compositions. Prereq: Intermediate Composition and Conversation or equivalent.

423-24 Advanced Conversation (1, 1) Informal conversation with native speaker on contemporary topics. Prereq: Intermediate Composition and Conversation or French for Business. 2 hrs weekly.

425 Introduction to Descriptive Linguistics (3) Theory and practice of linguistics analysis in subfields of phonetics, morphology, syntax, semantics, pragmatics and historical linguistics; discussion of relevance to learning and teaching of foreign languages and to study of literary texts.
Italian

GRADUATE COURSES

401 Dante and Medieval Culture (3) Introduction to significance of this great Italian writer. Prereq: 212 or consent of instructor.
402 Petrarch and Boccaccio (3) Prereq: 212 or consent of instructor.
403 Literature of the Rinascimento (3) From Pufendorf to Tasso, Quattrocento and Cinquecento. Prereq: 212 or consent of instructor.
405 Modern Italian Poetry (3) From Pascoli to Montale. Prereq: 212 or consent of instructor.
406 The Modern Italian Novel (3) From Manzoni to Carlo. Prereq: 212 or consent of instructor.
409 Directed Readings (3)
410 Italian Theatre (3) Survey of Italian theatre from Renaissance to present. Prereq: Intermediate Italian or consent of instructor.
421 Topics in Italian Literature and Cinema (3) Italian literature and cinema from 1930 to present focusing on literary works translated into English and adapted to film. Investigation of relationship between literature and cinema and achievement of greater understanding of Italian culture since 1950. Films in Italian with English subtitles. May be repeated. Maximum 6 hrs. (Same as Cinema Studies 421.)
425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, and Linguistics 425.)
426 Methods of Historical Linguistics (3) (Same as German 426, French 426, and Linguistics 426.)
429 Romance Linguistics (3) (Same as French 429 and Linguistics 429.)
501 Readings in Italian Literature (3) Topics vary. May be repeated with consent of department.
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.

Spanish

GRADUATE COURSES

421 Phonetics (3) Prereq: Intermediate Conversation and Composition or consent of instructor.
422 Advanced Grammar (3) Prereq: Intermediate Composition and Grammar and minimum of 15 hours as second language.
425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, and Linguistics 425.)
426 Methods of Historical Linguistics (3) (Same as German 426, French 426, and Linguistics 426.)
430 Literature of the Rinascimento (3) From Pulcrito Tasso, Quattrocento and Cinquecento. Prereq: Intermediate Composition and Grammar or equivalent.
432 Advanced Conversation (3) Prereq: Intermediate Conversation and Grammar and minimum of 15 hours as second language.
433 Golden Age Poetry (3) Garcilaso, Fray Luis de León, San Juan de la Cruz, Quevedo, and Gongora.
435 Golden Age Prose (3) Wide range of prose fiction in Spain during the 16th and 17th centuries: Moorish, picaresque, sentimental, pastoral and exemplary novels, and dialogues.
439 Special Topics in Spanish or Spanish-American Literature (3) May be repeated with consent of instructor. (Same as Spanish and Spanish-American Literature or equivalent.)
441 Special Topics in Spanish or Spanish-American Literature (3) May be repeated with consent of department. Maximum 6 hrs.
471 Latin American Civilization (3) Latin America's diverse heritage and major social and political institutions. Prereq: Aspects of Spanish and Spanish American Literature or consent of instructor.
479 Special Topics in Latin American Literature (3) Analysis of Latin American literature as a means of understanding its relationship to Latin and Iberian American literature. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.
500 Thesis (1-15) P/N only. E
520 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when the student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
522 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and cultural aspects through seminars, demonstrations, peer teaching, and observation of foreign language classes. Prereq: A grade of 'B' or better in Advanced Conversation and Composition, or consent of instructor. (Same as French 522, German 522, and Linguistics 522.)
531 Old Spanish (3) Evolution of Spanish language from its origins through 16th century.
533 Golden Age Prose (3) Wide range of prose fiction in Spain during the 16th and 17th centuries: Moorish, picaresque, sentimental, pastoral and exemplary novels, and dialogues.
534 Don Quixote (3)
535 Golden Age Poetry (3) García de la Cueva, Bécquer, and Góngora.
536 Golden Age Drama (3) Major dramatists of period: Lope de Vega, Tirso de Molina, and Pedro Calderón de la Barca.
537 Eighteenth- and Nineteenth-Century Spanish Literature (3) Major works from the 18th and 19th centuries: Galdos, Picasso, and Góngora.
540 French and German 426, and Linguistics 426.)
542 20th-Century Spanish Literature: Post-Civil War through 1940's (3) Major works from the 18th and 19th centuries: Galdos, Picasso, and Góngora.
543 20th-Century Spanish Literature: Post-Civil War through 1940's (3) Major works from the 18th and 19th centuries: Galdos, Picasso, and Góngora.
545 Hispanic Prose (3) Close reading and analysis of representative works by selected dramatists of each period, either Spanish or Spanish-American. Topics vary. Prereq: Aspects of Spanish and Spanish-American Literature or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.
546 Hispanic Poetry (3) Major poets of each period, either Spanish or Spanish-American. Topics vary. Prereq: Aspects of Spanish and Spanish-American Literature or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.
550 Techniques of Literary Analysis and Research Methods (3) Selection of techniques in different areas of Spanish literature. Prereq: Aspects of Spanish and Spanish-American Literature or equivalent.
551 Special Topics in Spanish or Spanish-American Literature (3) May be repeated with consent of department. Maximum 6 hrs.
552 Directed Readings (3)
561 Spanish American Colonial Literature (3) From pre-Columbian through 18th century. Prereq: Aspects of Spanish and Spanish-American Literature or equivalent.
Music (College of Arts and Sciences)

MAJOR

Music .................................................. M.M.

Wayne Bailey, Head

Professors:

Bailey, Wayne, D.M.A. ......................... Colorado
Bitzas, George C., M.M. ....................... Converse
Brook, John P., M.M. .......................... Alabama
Coker, J., M.A. .................................. Sam Houston
Combs, F. M., M.A. ............................. Missouri
Jacobs, K. A., D.M.A. ......................... Texas
McClelland, D. K., M.A. ....................... Colombia
MacMorran, W. S., M.M. ..................... Wisconsin
Moore, M. C., Ph.D. ........................... Michigan
Northington, D. B., D.M.A. .................... Yale
Pederson, D. M., Ph.D. .......................... Iowa
Sousa, G., Ph.D. .................................... Ohio State
Stutzenberger, D. R., D.M.A. .................. Maryland

Associate Professors:

Adams, Fay, M.M. .............................. Tennessee
Boling, M. E., M.M. ............................ Tennessee
Brown, Donald R., Hs.D. ...................... Tennessee
Brunell, D. E., D.M. ............................ Indiana
Carter, P. S., M.M. .............................. Colorado

Davies, Dolly C., M.M. ......................... Tennessee
Gay, Jr., L. C., Ph.D. .......................... Columbia
Hough, Don, M.M. ............................. New Mexico
Leach, C. F., M.M. ............................. Tennessee
Murphy, B. A., Ph.D. .......................... Oklahoma City
Searle, S. M., M.M. ............................. Tennessee
Smith, C. B. M. .................................. SUNY-Fredonia
Sperl, G. R., M.M. ............................. Indiana
Zelmanovich, Matus, M.A. ................... Lvov

Assistant Professors:

Baldwin, Wesley, M.M. ........................ New England
Batay, A. L., D.M.A. ............................. South Carolina
Binder, S. L., D.M. .............................. Florida State
Freeman, Carroll, M.P.A. ...................... Oklahoma City
Haar, Paul, M.M. .............................. Kansas
Hawthorne, W., Ph.D. ......................... Cincinnati
Keathley, Elizabeth, Ph.D. ..................... SUNY (Stony Brook)
Richter, Jorge, M.S. ............................. Andrews
Wentzel, A. N., M.M. ........................... Southern Cal

The School of Music offers the Master of Music degree with concentrations in accompanying, choral conducting, composition, instrumental conducting, jazz, music education, music theory, performance (organ, piano, strings, voice, woodwinds, percussion), and piano pedagogy and literature.

Applicants must have completed an undergraduate degree that is approximately equivalent in music requirements to degrees conferred by UT, with a major appropriate to the applicant's prospective area of concentration.

Applicants who plan to pursue the concentration in performance or music education are required to audition for the appropriate area faculty. Applicants for admission to the program in composition must submit scores and tape recordings of representative works. Applicants for the concentration in jazz must audition in jazz improvisation and jazz piano proficiency and interview with members of the faculty in this area. Other applicants are required to have an interview with members of the faculty in the prospective area of concentration.

All entering master's degree students are required to take Diagnostic Examinations in music theory, ear-training, and music history/literature. These examinations are given by the School of Music at the beginning of each semester.

THE MASTER'S PROGRAM

A minimum of 33 semester hours of coursework is required for the Master of Music degree. These hours are specifically distributed according to the area of concentration. All concentrations require coursework in music bibliography, music history/literature, and music theory and allow for elective courses. Specific curricula are available from the department. All concentrations require a written and oral final examination.

A thesis is required of students in composition, musicology, and music theory. A graduate recital or performance project is given in lieu of thesis by students with concentrations in performance, pedagogy, jazz, accompanying, choral conducting, and instrumental conducting.

Music Education

GRADUATE COURSES

510 Foundations of Music Education (3) Historical, philosophical and aesthetic bases. Prereq: Consent of instructor.

520 Research in Music Education (3) Definition of research problems, data collection and analysis, and research report writing. Application of knowledge of research techniques to analysis of existing research literature in music education. Prereq: Consent of instructor.


570 Studies in Multicultural Music Education (3) Study of music literature, art and customs of various cultures appropriate for students in K-8. Strategies and techniques for teaching music at this level.

571 Musical Repertoire Laboratory (1) Performance of music from various cultures; production of musicals designed for the student for grades K-8. Singing, dancing, acting, set design, traditional and non-traditional instrumental ensembles. Limited to students majoring or concentrating in art, dance or theatre. Prereq or coreq: 570. May be repeated. Maximum 2 hrs.


575 Professional Internship in Teaching (1-8) Teaching and teaching-related experiences in professional settings in public schools. Enrollment limited to post-baccalaureate students in professional year program. Prereq: Admission to Teacher Education program and consent of School of Music. May be repeated. Maximum 12 hrs. S/NC only. F, Sp.

580 Seminar in Music Education (3) Class investigation and individual reporting of pertinent topics and issues in music education. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

590 Special Topics in Music Education (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

591 Clinical Studies (4) Group and individual seminar activities during full-time internship. Application and evaluation of professional competencies. Completion and presentation of portfolio and analysis of teaching project. Coreq: 575.

593 Special Problems in Music Education (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

Music Ensemble

GRADUATE COURSES

503 Small Jazz Ensemble (1) May be repeated. Maximum 12 hrs.

504 Jazz Ensemble (1) May be repeated.
Music in the Renaissance (3) From 1400 to 1600. Mass, motet, chansons, madrigal, and other vocal and instrumental forms and genres.

Music Bibliography (3) Bibliographic methodology in music.

Music in Christian Worship (3) Hymnody, liturgies, and liturgical music.

Music Aesthetics (3) Nature of music and music experience, sense perception and emotions, music, and role of artist in society. Aesthetic viewpoint of individuals and historical eras through selected writings.

Music in Christian Worship (3) Hymnody, liturgies, and liturgical music.

Music in the Baroque Period (3) From c. 1600 to 1750; rise of opera and oratorio, sacred and secular cantatas, instrumental forms, performance practices.

Music in the Classic Period (3) Evolution of classical style from pre-classic music to music of Haydn, Mozart, and early Beethoven.

Music in the Romantic Period (3) Nineteenth-century musical styles from Beethoven to post-romantics.

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Music in the Romantic Period (3) Nineteenth-century musical styles from Beethoven to post-romantics.

Music Instrumental

GRADUATE COURSES

490 Instrumental Conducting (3) Development of knowledge and skills in instrumental conducting; study of various periods and composers and relationship of different styles to conductor's art; musical analysis and practice in conducting. Prereq: Music Education 320 or equivalent.

580 Band History and Literature I (3) Antiquity to 1900.

581 Band History and Literature II (3) 1900 to present.

583 Recitative for Instrumental Conductors (1) Prepares for conducting recitatives. Prereq: Consent of instructor.

584 Practicum for Instrumental Conductors (1) Prepares for conducting performances. Prereq: Consent of instructor.

895 Instrumental Conducting Performance (1) Prepares and performs for band or orchestral music. Prereq: Consent of instructor.

Music Performance

GRADUATE COURSES

All performance courses require an audition and consent of instructor. May be repeated. Maximum 8 hrs toward M.M. degree.

403 Flute (1-4)

405 Oboe (1-4)

410 Bassoon (1-4)

415 Clarinet (1-4)

420 Saxophone (1-4)

425 Horn (1-4)

430 Trumpet (1-4)

435 Trombone (1-4)

440 Baritone (1-4)

445 Tuba (1-4)

450 Percussion (1-4)

455 Voice (1-4)

460 Violin (1-4)

465 Viola (1-4)

470 Cello (1-4)

475 String Bass (1-4)

476 Electric Bass (1-4)

479 Guitar (1-4)

480 Piano (1-4)

485 Harpsichord (1-4)

490 Organ (1-4)

494 Composition (1-3)

495 Composition with Electronic Media (1-3)

499 Improvisation (1-2) May not be used toward performance requirement. Maximum 8 hrs toward performance requirement.
Music Technology

GRADUATE COURSES

540 Computer Music Transcription (3) Projects in notation, playback, and publication of music incorporating elements of word processing, graphic design, sequencing, and page layout. Study of MIDI protocol as applied to computer music work station design. No credit toward M.M. concentration in Music Technology emphasis. Prereq: Consent of instructor.

550 Computer Projects (3) High-level programming languages used to design and implement computer-managed instruction; Internet development tools; writing of documentation for computer projects. Prereq: 540 or equivalent.

560 Technology in Music Research (3) Use of technology for research projects in music analysis or pedagogy: development and execution of research project. Prereq: 550.

Music Theory

GRADUATE COURSES

430-440 Counterpoint I, II (3,3) 430--study of species counterpoint in modal and tonal styles, works of Palestrina and J.S. Bach; Prereq: 220. 440--writing of contrapuntal forms of 18th century and fugue; analysis of works from 18th through 20th centuries. Prereq: 430.

450 Choral Arranging (2) Analysis of scores and writing of arrangements for choruses. Prereq: Theory IV or consent of instructor.

510 Musical Styles (3) Elements of design and their role in definition of musical styles. Prereq: Consent of instructor.

520 Analytical Techniques (3) Analytical techniques, contemporary approaches. Tonal and non-tonal music. Prereq: Consent of instructor.

530 Music Theory Pedagogy (3) Techniques, methods, and materials involved in college-level theory programs. Use of technology and review of existing software. Prereq: Consent of instructor.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of department head.

Music Voice

GRADUATE COURSES

410-20 Song Literature I, II (2,2) 410--German songs, 420--French, Italian, Russian, Scandinavian, Czech, and American art songs. Graduate credit not available for students in vocal performance.

425 Functional Dictation for Singers (3) Comprehensive survey of singing diction in six languages: English, French, German, Italian, Latin and Spanish. Basic instruction in International Phonetic Alphabet; development of basic diction skills; overview of diction styles and traditions in each language; survey of diction resources and reference materials. Does not fulfill deficiency requirements for graduate students in voice or accompanying.

490 Church Music Methods, K-12 (3) Development of child's voice through teenage years, vocal/choral techniques for various age groups through high school, choral literatures for the youth church choir, non-vocal musical activities appropriate to various age groups as used in church music programs (e.g., Off, handbells, rhythm activities, etc.)

510 Vocal Literature Seminar (3) Topics vary. May be repeated. Maximum 6 hrs.

520 Music Theatre Performance Techniques (3) Improvisation, movement, and basic techniques for dramatic vocal performance. Prereq: Vocal major or consent of instructor. Prereq for credit: 5 hours.

530 Opera Performance (2) Prereq: Consent of instructor. May be repeated. Maximum 5 hrs.

540 Opera Production (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

550-60 Advanced Vocal Pedagogy I, II (2,2) 550--Study of vocal production, examination of different methods. I--Study of teaching materials, observation of studio teaching, analysis of vocal problems in selected students, and supervised teaching.

570 Vocal Chamber Music Performance (2) Prereq: Consent of instructor.

580-85 Choral Literature I, II (2,2) Choral music from middle ages to present with consideration of historical development of major choral genres.

590 Advanced Choral Conducting (3) Expansions and continued refinement of conducting techniques; development of choral rehearsal skills. Prereq: Consent of instructor.

594 Project in Choral Conducting Performance (1-3) Public performance, critical document; recording project. Prereq: Consent of instructor. May be repeated.

595 Choral Conducting Seminar (3) Score reading and preparation; problems of interpretation, performance practices, and conducting techniques. Prereq: 590 or consent of instructor. May be repeated.

Nuclear Engineering

(College of Engineering)

MAJOR

Nuclear Engineering

DEGREES

M.S., Ph.D.

H. L. Dodds, Head

Professors:

Dodds, H. L., PE, Ph.D.......................... Tennessee
Mihalczw, J. T., Ph.D.......................... Tennessee
Miller, L. F., PE, Ph.D.......................... Texas A&M
Mynatt, F. R., Ph.D.............................. Tennessee
Shannon, T. E., Ph.D............................ Tennessee

Uhrig, R. E. (Distinguished Prof.), PE, Ph.D.......................... Iowa State
Upadhyaya, B. R., PE, Ph.D...................... California

Associate Professors:

Groer, P. G., Ph.D............................... Vienna
Hines, J. W., Ph.D............................... Ohio State
Pevery, R. E., PE, Ph.D.......................... Tennessee
Ruggles, A. E., Ph.D............................ Rensselaer
Scott, T. H., PE, Ph.D............................ Florida
Townsend, L. W., Ph.D........................... Idaho

The Department of Nuclear Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees. Students may elect a traditional nuclear engineering M.S. or Ph.D. program (focusing on fission energy or fusion energy) or a radiological engineering concentration at the master's level. The radiological engineering concentration prepares students for careers in the radiation safety field (health physics). The program is designed for graduates of undergraduate programs in engineering, physics, biology and chemistry.

All entering students must have, as a minimum, competency in mathematics through ordinary differential equations, competency in atomic and nuclear physics, and competency consistent with a course in introductory nuclear engineering. If these competencies do not exist, the student must take appropriate courses for undergraduate credit. This department head is the contact for all interested students, both those with nuclear engineering degrees and those from other disciplines.

THE MASTER'S PROGRAM

A graduate program leading to the Master of Science is available to graduates of recognized undergraduate curricula in engineering and physics. Each applicant will be advised as to the necessary prerequisite courses before he/she enters the program.

The student must complete 24 semester hours of coursework approved by the student's advisory committee that includes the following:

1. A major consisting of a minimum of 12 semester hours of graduate courses in nuclear engineering. This must include at least one of the following sequences: 511, 512, 551, 552; 571, 572.

2. A minor of 6 semester hours of elective courses in mathematics, statistics or computer science.

3. Six semester hours in either nuclear engineering or a related field.

The M.S. candidate must also demonstrate research or design capability. This requirement may be satisfied by a thesis project or engineering practice projects as described below:

Thesis - The student performs independent research on a topic approved by the graduate committee. He/she submits a thesis on this research. The student then must pass an oral examination on the thesis and all graduate coursework. The student must enroll for six semester hours of NE 500 (Thesis).

Engineering Practice - The student performs independent research on two to four separate topics approved by his/her
graduate committee. Each project is similar to a thesis project but smaller in scope. He/She submits a report, in thesis format, on each project. The student must then pass an oral examination on his/her engineering practice report and an oral dissertation of the completed project. The student must enroll for six semester hours of NE 598 (Nuclear Engineering Practice).

THE DOCTORAL PROGRAM

Students in the field of nuclear engineering desiring to study for the Doctor of Philosophy must have a Bachelor of Science or Master of Science from an accredited university, with a major in engineering or physics. All candidates will be required to demonstrate general competence in a comprehensive area of knowledge in the areas of engineering, science, mathematics, physics, and nuclear engineering.

Specific course requirements for the Ph.D. in Nuclear Engineering include:

1. A minimum of 48 semester hours beyond the Bachelor’s degree, exclusive of credit for the M.S. thesis or Nuclear Engineering Practice.

2. A minimum of 24 semester hours in doctoral research, NE 600.

3. A minimum of 30 semester hours in nuclear engineering courses numbered 500 and above (or the equivalent), with at least 9 semester hours of 500-level courses. These are exclusive of thesis or dissertation credit.

4. A minimum of 12 semester hours in mathematics, computer science, or statistics courses beyond nuclear engineering undergraduate requirements numbered 400 or above.

5. A minimum of 6 semester hours in courses numbered 500 or above from a department other than nuclear engineering. The choice depends on the student's overall program and should expand his/her knowledge in a given field.

6. A reading knowledge of one foreign language may be specified by the student's doctoral committee.

The comprehensive examination is prepared by the nuclear engineering faculty and consists of 12 hours of written examinations. All past examinations are filed in the library, and students are encouraged to review them. Students are invited to take the comprehensive examination after completing approximately 30 semester hours of coursework. A student who fails the written part of the examination must take and pass the examination the next time it is offered to remain in the Ph.D. program. Registration for NE 500 is not permitted until the written examination is passed. The comprehensive examination is completed with a successful oral defense of the dissertation proposal.

A candidate must successfully defend, in an oral examination, all material presented for the degree—all coursework and the dissertation.

GRADUATE CREDIT FOR UNDERGRADUATE COURSES

400-level courses in nuclear engineering may be used for graduate credit. However, students must recognize that at least two-thirds of the minimum required hours (30) in a master's degree program must be taken in courses numbered 500 or above.

GRADUATE COURSES

403 Nuclear and Radiological Engineering Laboratory II (3) Cross section measurements, diffusion properties of materials, shielding, dynamics and control, tritium, alpha and beta spectroscopy, radiation fields and dosimetry. Prereq: Nuclear and Radiological Engineering Laboratory I.

404 Nuclear Fuel Cycle (3) Mining, milling, fabrication, in-core management, reprocessing, waste disposal, regulatory and health issues and requirements. Prereq: 470 or equivalent.

406 Radiation Shielding (3) Types of radiation sources, fundamentals of gamma ray and neutron attenuation, biological effects, approximate methods of shielding design, concrete ordnance, and Monte Carlo. Prereq: Physics 232.

421 Introduction to Nuclear Criticality Safety (3) Fundamentals of nuclear criticality safety, criticality accidents, safety standards, overview of experiments, computational methods, and applications. Prereq: Introduction to Nuclear Engineering.


432 Radiation Risk Analysis (3) Radiation risk estimates for external and internal radiation, dose response models, dose rate effects, prediction of radiation risks, radiation safety standards.

463 Introduction to Fusion Energy I (3) (Same as Electrical Engineering 463.)

464 Introduction to Fusion Energy II (3) (Same as Electrical Engineering 464.)

470 Nuclear Reactor Theory I (3) Fundamentals of reactor physics relative to cross sections, kinematics of elastic scattering, reactor kinetics, reactor systems, and nuclear data. Linear and non-linear, analytical and numerical methods applicable to general criticality problems. Prereq: 470 or equivalent.

483 Introduction to Reliability Engineering (3) Probabilistic failure models, parameter estimation (maximum likelihood, Bayesian techniques), model identification and validation, life testing, failure prediction, system reliability, preventive maintenance, and warranty analysis. Prereq: Senior standing or consent of instructor.

484 Introduction to Maintenance Engineering (3) Principles of maintenance and reliability in engineering and management. Information extraction from machine learning, monitoring, maintenance management, identification and classification, life testing, failure prediction, system reliability, preventive maintenance, and warranty analysis. Prereq: Senior standing in engineering and consent of instructor.

484 Special Topics in Nuclear Engineering (3) Problems related to recent developments and practice. Prereq: Senior standing and consent of instructor. May be repeated. Maximum 6 hrs.

500 Thesis (1-15) P/N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when using University facilities and/or faculty time before degree is completed. May not be toward degree requirements. May be repeated. S/NC only. E

511-12 Transport Processes in Nuclear Engineering (3, 3) Rheology of non-Newtonian fluids, integral and conservation equations for single and multi-component fluids, development of differential conservation equations for fluids, energy, and momentum; exact and approximate solutions of equations of motion; boundary layer analysis; numerical analysis of fluid flow and heat transfer.

521 Nuclear Systems Dynamics and Control (3) Introduction to state variable methods for system dynamics and control analysis and application of these methods to nuclear plant dynamics, simulation, and control problems.

522 Experimental Methods in Reactor Dynamics (3) Techniques to time domain and frequency domain analysis, introduction of procedures for obtaining and analyzing data, interpretation of results, presentation of data.


543 Selected Topics in Nuclear Criticality Safety (3) Criticality analysis and experimental methods for enrichment, fabrication, storage, reprocessing, and transport applications; overview of safety practices and regulatory requirements. Prereq: Consent of instructor.

550 Radiation Measurements Laboratory (3) Physics and electronics associated with radiation detection and measurement, methods of data analysis. Applicability of various detector measurements and fundamental methods of radiation detection instrumentation. Prereq: Consent.


552 Radiological Assessment and Dosimetry (3) Transport of radionuclides, external and internal dosimetry, personnel dosimetry. Prereq: Consent of instructor.

553 Radiation Risk Analysis (3) Methods for radiation risk prediction, survival analysis, parameter estimation, real data analysis, and computational techniques. Prereq: Consent of instructor.


572 Nuclear System Design (3) Design analysis of a nuclear system, interface with non-nuclear aspects of system design, system reliability and economics. Prereq: Consent of instructor.

576 Expert Systems in Engineering (3) Application of expert systems in engineering: logic and rationale, development of expert systems, advanced topics. Prereq: Consent of instructor. (Same as Mechanical Engineering 576 and Engineering Science 576.)

577 Neural Networks in Engineering (3) Neural network technology for use in intelligent expert systems, neural computing, structure of neural computing systems, programming, and applications. Prereq: Consent of instructor. (Same as Mechanical Engineering 577 and Engineering Science 577.)

578 Fuzzy Systems in Engineering (3) Fuzzy numbers, fuzzy environment, uncertainty and randomness, approximation reasoning, fuzzy models and structures, decision problems in fuzzy environment, fuzzy computing, fuzzy logic controllers, fuzzy expert sys-
Nursing

(College of Nursing)

MAJOR DEGREE

Nursing M.S.N., Ph.D.

Joan L. Creasia, Dean
Martha Alligood, Director of M.S.N. Program
Sandra Thomas, Director of Ph.D. Program

Professors:
Alligood, Martha R., Ph.D. New York
Creasia, Joan L., Ph.D. Maryland
Droppleman, Patricia G., Ph.D. Tennessee
Farr, Glen, Pharm.D. Tennessee
Groer, Maureen, Ph.D. Illinois
Mozingo, John N., Ph.D. Walden

Pierce, Joan U., Ph.D. Utah
Seavor, Carol, Ed.D. Massachusetts
Thomas, Sandra P., Ph.D. Tennessee

Associate Professors:
Bowen, Sheila, Ph.D. Tennessee
Davis, Mitzi, Ph.D. Tennessee
Elliott, Mary Jo, Ph.D. Alabama (Birmingham)
Fenske, Mildred M., Ph.D. Vanderbilt
Hall, Joanne, Ph.D. San Francisco
McGuire, Sandra, Ed.D. Tennessee
Smith, Helen, Ph.D. Maryland
Wallace, Debra C., Ph.D. South Carolina

Assistant Professors:
Brown, Allie J., M.S.N. (Albany) (Birmingham)
Brown, Mary Lynn, Ph.D. Tennessee
Conlon, Kathleen P., M.S.N. SUNY (Buffalo)
Ewing, Ginger W., M.S.N. Tennessee
Fox, Marie X., M.S.N. Tennessee
Helton, Sally M., M.S.N. Texas Women's Kollar, Mary, Ph.D. Tennessee
Nalle, Maureen, Ph.D. Tennessee
Pierce, Margaret, M.S.N. Tennessee

THE MASTER'S PROGRAM

The College of Nursing offers the Master of Science in Nursing degree with concentrations in adult health nursing, family nurse practitioner, mental health nursing, nursing administration, and nursing of women and children. The program is accredited by the National League for Nursing Accrediting Commission and is unconditionally approved by the Tennessee Board of Nursing.

The purpose of the Master's program in nursing is to prepare leaders, managers, and practitioners who facilitate quality decisions and promote high standards of health care services. The program prepares advanced practice nurses for a career in adult health nursing, nursing of women and children, and mental health nursing as well as role preparation as nurse practitioners, clinical nurse specialists or nursing administrators.

Advanced Practice nursing involves the delivery of care, management of resources, interdisciplinary collaboration, and application of technology, information systems, knowledge, and critical thinking.

Admission Requirements
1. Meet requirements for admission to The Graduate School.
2. Achieve a score of 500 or above on the verbal and on the quantitative portions of the Graduate Record Examination.
3. Achieve a TOEFL score of 550 or above if native language is not English.
4. Hold a Bachelor's degree in Nursing (BSN) from a National League for Nursing accredited program.
   a. Hold or be eligible for licensure to practice nursing in Tennessee.
   b. Have an undergraduate GPA of 2.5 or higher on a 4-point scale, or a GPA of 3.0 for courses in the undergraduate major.
   c. Have completed a health assessment and physiology course in the past five years.
   d. Have completed 3 hours of graduate level statistics.

Hold a bachelor's degree in a discipline other than nursing (master's entry student or RN) from an accredited college or university.

a. Have a cumulative undergraduate GPA of at least 3.0 on a 4-point scale.

b. Have satisfactorily completed the following prerequisite courses: chemistry (8 hrs); microbiology (including lab); anatomy and physiology (6-8 hrs); nutrition (covering lifespan in health and illness); behavioral sciences (12 hrs in sociology, anthropology, growth and development, and at least one general psychology course); undergraduate research course or equivalent; 3 hours of graduate level statistics prior to enrollment in graduate research course.

5. New students normally are admitted to the program only at the beginning of fall semester. However, under special circumstances and on a space available basis, a B.S.N. graduate may be admitted at the beginning of spring or summer term in a temporary non-degree status. Applications from full-time BSN and master's entry students for fall admission must be received by February 1. Part-time and post-master's applications must be received by October 1.

Special Requirements
1. Each student must hold personal professional liability insurance.
2. Registered nurses must be licensed to practice nursing in Tennessee.
3. Each student must present proof of hepatitis B vaccination and rubella and rubella immunization or sufficient titer for immunity; TB status.
4. Each student must present evidence of current 2-person CPR certification.
5. Non-registered nurse students must have completed courses in chemistry, microbiology, anatomy, and physiology plus 12 semester hours of behavioral science courses.
6. Contact student services for more detailed information about the application process: Student Services/MSN Program, UT College of Nursing, 1200 Volunteer Blvd., Knoxville, TN 37996-4180; phone: 865 974-7606.

Thesis and Non-Thesis Options
The thesis option is available for interested students and is especially encouraged for those who are considering pursuit of a doctoral degree someday in the future. Students who choose the non-thesis option must register for 582 Scholarly Inquiry for Advanced Practice Nursing.

Program Requirements
All students must complete a minimum of 33 semester hours distributed as follows:

Core (9 credits)
503 Health Promotion in Advanced Practice Nursing 3
510 Theoretical Foundations of Nursing 3
520 Advanced Practice Nursing and Health Delivery Systems 3

Advanced Practice Core (9 credits)*
504 Advanced Health/Physical Assessment 3
505 Advanced Clinical Pharmacology 3
515 Advanced Pathophysiology for Nursing Practice 3

* Only one course from the above core may be counted toward the M.S.N. degree.
Nursing Research (6-9 credits)
501 Nursing Research: Methods, Design & Analysis 3
500 Thesis 6
OR
582 Scholarly Inquiry for Advanced Practice Nursing 3

Concentration (12-17 credits)—choose one
550-51 Nursing of Women and Children 16
550-61 Mental Health Nursing 12
570-71 Family Nurse Practitioner 17
590-91 Nursing Administration 12

Elective (6 credits)—Required for students in nursing administration concentration only.
*Not required for nursing administration concentration.

Students who enter the program as non-RNs must complete the following under-graduate nursing courses in addition to meeting the requirements listed above:

301 Clinical Pharmacology 3
302 Introduction to Professional Nursing 5
304 Nursing Assessment and Health Promotion 4
306 Health Deviation Concepts I 3
316 Health Deviation Concepts II 4
330 Nursing of Adults 6
414 Community Mental Health Nursing 6
415 Family/Community Health Nursing 6
431 Nursing of Children 4

Registered nurses whose bachelor's degrees are not in nursing must have completed courses in chemistry, nutrition, microbiology, anatomy, and physiology plus 12 hours of behavioral science courses. They must also complete 305, 332, 405, and 433 and complete or successfully challenge the following:

301 Clinical Pharmacology 3
304 Nursing Assessment and Health Promotion 4
306 Health Deviation Concepts I 4
316 Health Deviation Concepts II 4
330 Nursing of Adults 6
401 Family Health Nursing 6
411 Psychosocial Long Term Nursing 6
431 Nursing of Children 4

A total of 16-18 credits can be obtained by successful completion of the NLN Nursing Mobility Profile Examination. See undergraduate catalog for other challenge options. RNs who are in the process of completing a BSN at UT with the intent of enrolling in the MSN program follow the same plan with the addition of 313.

Final Examination Requirements
All students must successfully complete a final examination as required by The Graduate School. For thesis students, the examination will consist of an oral defense of the thesis as well as other written or oral questions designed to measure student mastery of the entire program of study. For non-thesis students, the written examination will cover the entire program of study and may, at the discretion of the student's committee, be followed by an oral examination.

Special Policies
1. If the clinical performance of any student for any course is found to be unsatisfactory, the student will receive a grade of "F" for the course.
2. If a student achieves a final grade of "D" or "F" for any required undergraduate or graduate nursing course, he or she will not be permitted to repeat the course and will be required to withdraw from the program.
3. If the clinical performance of any student is characterized by unethical, unprofessional or unsafe behavior, or behavior that places the client in jeopardy, the student will be required to withdraw from the program.

THE DOCTORAL PROGRAM
The College of Nursing offers a doctoral program leading to the Doctor of Philosophy degree with a major in Nursing. This is a unified program offered jointly with The University of Tennessee, Memphis, College of Nursing. Students may complete all or part of the program at either site. The dissertation must be completed in its entirety at one site.

The doctoral program prepares nursing scholars capable of integrating research, theory, and practice into their roles as researchers, educators, and/or administrators. Specifically, the graduate of this program should be able to:

1. Analyze, test, refine, extend, and expand the theoretical basis of nursing practice.
2. Conduct research that generates knowledge and advances nursing as a discipline.
3. Provide leadership as nurse researchers, educators, and/or administrators in current and emerging health care settings.
4. Collaborate with members of other disciplines in health-related areas of mutual concern.
5. Analyze, develop, and recommend health care policy at various levels.

Admission Requirements
1. Meet requirements for admission to The Graduate School.
2. Hold a master's degree in nursing from a program accredited by the National League for Nursing. Some outstanding applicants who are prepared at the bachelor's level in nursing may be considered. In such cases, graduate level courses in nursing theory, concentration specialty, and/or research will be integrated into the terminal program of doctoral degree requirements.
3. Have a minimum cumulative grade-point average of 3.3 on a 4.0 scale for previous college work.
4. Have a combined score of at least 1000 on the verbal and quantitative sections of the Graduate Record Examination.
5. Have successfully completed a basic statistics course and graduate nursing theory and research courses prior to enrollment in nursing doctoral level courses.
6. Have TOEFL scores of at least 550 if native language is not English.
7. Complete Graduate Program Data Form, College of Nursing.

8. Submit Graduate School Rating Forms from three college level instructors and/or nurses and administrators who have supervised applicant's professional work.
9. Submit a sample of scholarly writing (e.g., thesis, published paper).
10. Submit an essay describing personal and professional aspirations.
11. Submit Graduate Application for Admission, academic transcript(s), Graduate Record Examination scores, and, if required, TOEFL scores to the Graduate School.
12. Submit three Graduate School Rating Forms, sample of scholarly writing, and Graduate Program Data Form with essay to the Director of the PhD program prior to November 1 of the year prior to fall admission.
13. Schedule a personal interview with the College of Nursing PhD Student Admissions Committee prior to March 15 of the year preceding Fall admission. International applicants may be interviewed by telephone or teleconferencing at the discretion of the admissions committee.

Program Requirements
The following courses are required for all students:
620 Directed Research 3
601-02 Theory Analysis & Construction I, II 6
605-06 Nursing Research Seminar 4
607 Qualitative Nursing Research 3
608 Quantitative Nursing Research 3
609 Research Practicum* 4
610 Nursing Science Seminar 2
611 Advanced Nursing Seminar 2
612 Health and Nursing Policy/Planning 3
614 Nursing Preceptorship 3
... Statistics 6
... Cognates 6
... Electives 3
600 Dissertation 24
TOTAL 72
*Note: A minimum of 1 hour per semester must be taken for 4 semesters.

Possible cognate areas include, but are not limited to, anthropology, child and family studies, psychology, education, management, medical ethics, public health, social work, philosophy, and statistics.

Doctoral Committee
Early in the student's program, a nursing faculty advisor will be selected by the student in consultation with the program director. The student's comprehensive examination committee consists of the faculty teaching core courses and one representative from the cognate area. The student then selects the dissertation committee. Four faculty holding the rank of assistant professor or above comprise the committee, three of whom (including the chair) must be approved by the Graduate Council to direct doctoral dissertations. At least one member of the committee must be from an academic unit other than nursing.

Special Policies
1. A maximum of 6 graduate hours taken before acceptance into the doctoral program may be applied toward the degree.
2. Minimum grades of B in all nursing doctoral courses and a 3.0 cumulative GPA are required for continuation in the program.

MINOR IN GERONTOLOGY

Graduate students in the College of Nursing may pursue a specialized minor in gerontology. This interdisciplinary, interdepartmental program gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S.N. program in Nursing is available to residents of the state of Oklahoma (concentration in nursing of women and children). The Ph.D. program is available to residents of the state of Arkansas. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E

501 Nursing Research: Methods, Design, and Analysis (3) Basic principles of research process in application to clinical questions; critical evaluation of nursing and health-related research. Prereq or coreq: 510, graduate level statistics. F, Sp

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or coursework below degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Health Promotion in Advanced Practice Nursing (3) Principles of health promotion, education, and innovative strategies for achieving wellness of individuals, families, groups, and communities.

504 Advanced Health/Physical Assessment (3) Development of advanced clinical reasoning and assessment skills to determine client health status and needs. Application of physical, psychological, sociocultural, and psychosocial concepts with implications for advanced practice nursing. Didactic (2.5) and lab (5).

505 Advanced Clinical Pharmacology (3) Pharmacological agents utilized to treat common, recurrent health problems: indications, contraindications, side and interactive effects of commonly prescribed drugs. Prereq: 501 or equivalent or consent of instructor. F


510 Theoretical Foundations of Nursing (3) Historical evolution of nursing science, nursing metaparadigm, and its influences on practice, and social, ethical, political, economic and technological factors which impact advanced practice nursing and delivery of health care.

510-06 Nursing Research Seminar (2, 2) Selected topics pertaining to dissertation process, research experience, and defense. Coreq: 501. May be repeated. Graduate level statistics course.

511 Statistical Applications to Nursing Research (3) Descriptive and inferential statistics: statistical concepts and applications to clinical settings and their applications to advanced practice nursing.

515 Advanced Pathophysiology for Nursing Practice (3) Advanced physiological and pathophysiological concepts, principles, and theories applied to deviations of human systems.

520 Advanced Practice Nursing and Health Delivery Systems (3) Nursing's role in dynamic health care system: health evaluation, organizational, social, ethical, political, economic and technological factors which impact advanced practice nursing and delivery of health care.

530 Adult Health Nursing I (6) Advanced practice nursing for health promotion, restoration, and maintenance of young, middle-aged, and older adults. Theories and research to advanced practice with clinical clients in a variety of settings. Prereq: 504, Prereq or coreq: 501. Coreq: 520. Didactic (2) and practicum (4). Sp

531 Adult Health Nursing II (6) Continuation of 530. Planning, provision, and management of health care for adult groups and communities. Prereq. 530. Didactic (2) and practicum (4). F

532 Advanced Practice Nursing: Models and Theories (6) Application of holistic nursing concepts to management of chronic and common health problems. Role refinement and exploration of major issues in delivery of holistic primary nursing care. Clinical experiences vary depending on student's intent to pursue certification as family or adult nurse practitioner. Prereq: MSN in clinical concentration, 505 equivalent, and consent of instructor. 3 hrs and labs. Su

550 Nursing of Women and Children I (6) Advanced practice nursing for women and children; clinical experience in role of nurse practitioner or clinical nurse specialist in various settings. Health promotion and nursing interventions for actual or potential health problems of women, children, and families. Prereq: 504, Prereq or coreq: 501. Coreq: 520. Didactic (2) and practicum (5). Sp

551 Nursing of Women and Children II (6) Continuation of 550. Role refinement of nurse practitioner or clinical specialist in health maintenance and restoration for women, children, and families. Prereq: 550. Didactic (3) and practicum (5). F

552 Parent Child Nursing Field Work and Seminar (3) Seminar and intensive clinical practicum designed to facilitate further development of specialized knowledge and skills utilized for advanced parent-child nursing practice. Prereq or coreq: 551. 1 hr and 4 labs. Sp

557 Nurse Midwifery Seminar I (1) Exploration of art and science of midwifery, nature and scope of midwifery practice, professional and ethical issues in advanced nursing practice. Prereq or coreq: 501. Sp

560 Mental Health Nursing I (6) Theories of advanced practice nursing for mental health problems; advanced practice nursing in specialty of mental health; clinical practice with clients of various ages in acute and community settings. Prereq: 504 or coreq: 501. Coreq: 520. Didactic (2) and practicum (4). Sp

565 Teaching Practicum (1-6) Individually designed teaching experience in college nursing program or nursing practice setting. Objectives to be developed collaboratively with student and faculty. Prereq or coreq: 564 and consent of instructor. S/NC or letter grade. Sp

566 Educational Principles and Strategies (3) Exploration and analyses of selected educational, curricula, teaching-learning strategies, and evaluation methods and principles and theories as applied to instruction of undergraduate nursing students, staff development, and patient education. Prereq. Consent of instructor. Su

570 Family Nurse Practitioner I (4) Application of advanced health/physical assessment and diagnostic reasoning in nursing management and primary care and of individuals and their families with actual and potential acute health problems; clinical experience in role of family nurse practitioner in a variety of settings. Prereq: 504, 515, Coreq: 520. Didactic (2) and practicum (2). Sp

571 Family Nurse Practitioner II (6) Continuation of 570. Management and primary care of individuals and their families in all developmental life stages; clinical experience in variety of settings. Prereq: 540. Prereq or coreq: 501. Didactic (2) and practicum (4). F

572 Family Nurse Practitioner III (7) Continuation of 571. Nursing management of chronic health problems of individuals and families in all developmental life stages; role refinement and exploration of major issues of family nurse practitioner; clinical experience in variety of settings. Prereq: 571. Didactic (2) and practicum (5). Sp

577 Special Topics (1-3) Topic is determined by faculty and student interest. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

582 Scholarly Inquiry for Advanced Practice Nursing (6) Use of research process through experimental learning or critical evaluation of science in area of interest. Conducted under faculty guidance and culminating in scholarly paper. Coreq: 501. May be repeated. Maximum 6 hrs. E

583 Directed Clinical Practice (1-9) Additional opportunities for advanced practice nursing practice. Objectives to be developed collaboratively by student and faculty. Prereq: In completion of core courses and minimum 1.5 credits from graduation in or completion of graduate level courses in clinical nursing. Maximum 9 hrs. S/NC or letter grade. E


590 Nursing Administration I (6) Exploration, analysis, and application of selected organizational, management theories and financial principles to delivery of nursing services. Structure, functions, organization, behavior, and adaptive processes of health care organizations. Prereq: 504. Prereq or coreq: 501, 520. 2 hrs and 4 labs. E

591 Nursing Administration II (6) Continuation of 590. Utilization of human and financial resources, conflict resolution, and organizational development with application to mid-level and top-level nursing administration positions. Prereq: 552. 2 hrs and 4 labs. F

593 Independent Study (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

600 Doctoral Research and Dissertation (3-15) P/NP only. E

601-02 Theory Analysis and Construction I, II (3, 3) Nursing theory development, analysis of existing health and nursing theories, theory building from existing knowledge. Prereq: 510 or equivalent or consent of instructor. F, Sp

605-06 Nursing Research Seminar (2, 2) Selected topics pertaining to dissertation process, research experience, and defense. Coreq: Completion of core courses. F, Sp

607 Qualitative Nursing Research (3) Exploration and analysis of philosophical bases, theoretical implications, methods, and data analyses of qualitative nursing research. Sp

608 Quantitative Nursing Research (3) Exploration and analysis of philosophical bases, theoretical implications, methods, and data analyses of quantitative nursing research. Prereq or coreq: Graduate level statistics course.

609 Research Practicum (1-3) Supervised individual or group research experience under guidance of faculty. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. S/NC or letter grade. E

610 Nursing Science Seminar (2) Critical analysis and synthesis of literature in selected focus area within nursing science. Prereq: Admission to doctoral program in nursing or consent of instructor. F

611 Advanced Nursing Seminar (2) Exploration of historical and current issues of interest to doctoral prepared nurses.
Nutrition

(College of Human Ecology)

MAJORS

DEGREES

Human Ecology ........................................Ph .D.
Nutrition .............................................M.S., M.S.-M.P.H.

Michael B. Zemel, Head

Professors:
Beauschene, Roy E. (Emeritus), Ph .D........Kansas State
Carruth, Betty Ruth, Ph .D.............Missouri
Namey, T. C., M.D. (Emeritus), Ph .D........Washington (St. Louis)
Sachan, Dileep S., Ph .D........Penn State
Skinner, Jean D., Ph .D............Oregon State
Smith, John T. (Emeritus), Ph .D.......Missouri
Zemel, Michael (Liaison), Ph .D..........Wayne State

Associate Professors:
Bailey, James W., Ph .D...........Iowa State
Brooks, M. D. (Memphis), M.S ..............Alabama
Haughton, B., Ed.D...........Columbia
Karlstad, Michael, Ph .D.............Loyola
Moussa, Naime, Ph .D..............Paris
Whelan, Jay, Ph .D............Penn State
Zemel, Paula, Ph .D........Ph. D. Wayne State

Assistant Professors:
Bittle, Joyce (Memphis), Ph .D........Tennessee
Chencharick, Judith (Memphis), Ed.D........Maryland

The Master of Science program is available in Nutrition, with a concentration in nutrition science or public health nutrition. A graduate degree combined with a Dietetic Internship (D.I.) beyond the baccalaureate degree qualifies the graduate to apply for the Registration Examination to become a Registered Dietitian (R.D.). Students may request more information from the department about the D.I. program. The Dietetic Internship is currently granted accreditation by the Commission on Accreditation for Dietetics Education of The American Dietetic Association, 216 W. Jackson Blvd., Chicago, IL 60606-6995, Tel: 312 899-5400. Students may also select an interdisciplinary minor in gerontology.

ADMISSION REQUIREMENTS

A complete file for review includes the Graduate School application form, Graduate Record Examination (GRE) scores for the general section, and three Graduate School Rating Forms completed by individuals who can attest to the applicant's potential for graduate education. Forms may be obtained from the Departmental Office, 229 Jesse Hall, University of Tennessee, Knoxville, TN 37996-1900. Forms may also be obtained from the Department's website at http://nutrition.he.utk.edu.

Admission into the graduate program in the department is dependent on completion of undergraduate courses that give the necessary background for success in the graduate program. Required undergraduate courses include: general and organic chemistry, physiological chemistry/biochemistry, physiology, statistics and advanced nutrition. Admission to the Ph. D. program in Human Ecology with a concentration in Nutrition Science requires a master's degree. Applicants to all programs with related experience may be given preference.

THE MASTER'S PROGRAM

Students may choose a thesis or non-thesis option in Nutrition. Attendance at Nutrition 540 is required every semester.

Thesis Option: The program consists of a minimum of 36 hours with at least 33 hours of coursework in the department. NTR 511, 512, 540, 541 and 3 hours of graduate level statistics are required. Students in public health nutrition must take NTR 511, 512, 513, 514, 515, 541 and the minor in public health. Six hours of Thesis 500, and 5 hours outside the department are required. A minimum of 22 hours at the 500 or 600 level is required. An oral comprehensive examination is required upon completion of the thesis.

Non-Thesis Option: The program consists of a minimum of 36 hours with at least 27 hours of coursework in the department. NTR 511, 512, 540, 541, 2 hours from 542-544 and 3 hours of graduate level statistics are required. Students in public health nutrition must take NTR 511, 512, 513, 514, 515 and the minor in public health. Six hours in one area outside the department are required. A minimum of 24 hours at the 500 and 600 level is required. A written comprehensive examination is required for completion of the program.

DUAL M.S.-M.P.H. PROGRAM

The College of Human Ecology offers a coordinated dual program leading to the conferral of both the Master of Science with a major in Nutrition (public health nutrition concentration) and the Master of Public Health. The dual program allows students to complete both degrees in less than four years. Programs of study are individualized and designed to meet the needs of students who are interested in the benefits of majors in both nutrition and public health. Therefore, it accommodates the interests of students who: 1) plan a career in public health nutrition and want to acquire the knowledge and skills of the nutritionist and public health professional; 2) plan a career in nutrition and want to acquire the knowledge and skills and the perspective of the public health professional; 3) plan a career in public health and want to acquire the knowledge, skills and perspective of the nutritionist.

Admission Requirements

Applicants for the M.S.-M.P.H. program must make separate application to, and be competitively and independently accepted by, the Department of Nutrition for the M.S., Department of Health and Safety Sciences for the M.P.H., and the Public Health Academic Program Committee.

Students who have been accepted by both departments may apply for approval to pursue the dual program anytime prior to, or after, matriculation in either or both departments. Such approval will be granted, provided that dual program studies be started prior to entry into the fourth semester of the M.S. and M.P.H. programs.

Curriculum

A dual degree candidate must satisfy the requirements for both the M.S. (public health nutrition concentration) and the M.P.H. degrees, as well as the requirements for the dual program. All candidates for the dual degree must successfully complete Health and Society (PH 555), two credits of Seminar in Public Health (PH 509), and a minimum of 60 credits. The Department of Nutrition will award a maximum of 6 semester hours of credit toward the M.S. degree for successful completion of approved graduate level courses offered in the Department of Health and Safety Sciences. The Department of Health and Safety Sciences will award a maximum of 11 semester hours of credit toward the M.P.H. degree for successful completion of approved courses offered in the Department of Nutrition. All courses for which cross-credit is awarded must be approved by the Public Health Academic Program Committee and the student's graduate committee. A single block field experience (or public health internship) is required of all students and the analytical field paper incorporates public health nutrition and the student's public health concentration. Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward the M.S. or M.P.H. degree for courses taken in the other program, except as such courses qualify for credit without regard to the dual program.

Approved Dual Credit

M.S. courses to be counted toward the M.P.H. program must include 10 semester hours of Field Study in Community Nutrition (NTR 515) and 1 semester hour of Graduate Seminar in Public Health (NTR 599). M.P.H. courses to be counted toward the M.S. include Public Health Administration (PH 520), Biostatistics (PH 530), and Epidemiology (PH 540).
THE PH.D. CONCENTRATION

The nutrition science concentration enables students to study the science of nutrition from the cellular level to the application of nutritional principles by people in changing environments.

The doctoral program emphasizes cellular/molecular nutrition, human nutrition, nutritional epidemiology, and experimental nutrition. Cognate areas may include anthropology, biochemistry, chemistry, communications, education, food technology, human development, physiology, public health, sociology, statistics, and/or toxicology.

Minimum requirements include:
1. Sixteen hours in nutrition including 4 hours at the 600 level (exclusive of dissertation);
2. NTR 511, 512, 541, and 2 hours from either 542-544;
3. Four hours of NTR 540, attendance required every semester;
4. Six hours of statistics;
5. Six hours in a cognate area;
6. Nine hours at the 600 level;
7. Students without college teaching experience are required to take the fall semester teaching seminar for GTA's and NTR 548 comprising a faculty-supervised problem in college teaching.

GRADUATE COURSES

500 Thesis (1-18) P/1N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

506 Culture, Food, and Nutrition (3) Food-related behavior of individuals and groups in the United States. Sociocultural, economic, and technological influences. Nutrition and food surveys, public policy. Prereq: Advanced Nutrition or consent of instructor. F

509 Graduate Seminar in Public Health (1) Same as Public Health. Prereq: 509 and Social Work 509. S

511 Advanced Physiological Chemistry (4) Bioenergetics, flux control, and hormonal interrelationships. Prereq: Advanced Nutrition or equivalent. F


513 Community Nutrition I (3) Orientation to community: assessment of nutrition problems, needs, and resources. Concurrent field experiences. Prereq: Advanced Nutrition or consent of instructor. F

514 Community Nutrition II (3) Planning, implementation, and evaluation of public health nutrition programs. Concurrent field experiences. Prereq: 513 or consent of instructor. Sp

515 Field Study in Community Nutrition (1-12) Personal participation in and analysis of state or regional community nutrition program. Location of in-depth study to be selected in consultation with instructor. Prereq: 513, 514 and consent of instructor. S/NC only. Su

516 Maternal and Child Nutrition (3) Nutrition principles related to growth and development during pregnancy, infancy, and childhood to age 5, high risk conditions. Prereq: Advanced Nutrition or consent of instructor. F

517 Childhood and Adolescent Nutrition (3) Application of nutrition principles to school age children; effects of diseases on growth and health maintenance; nutritional assessment and counseling for nutrition. Prereq: Advanced Nutrition or consent of instructor. Sp

518 Nutrition and Aging (3) Nutritional problems of adults: nutritional requirements, dietary intakes; effects of nutrition on biologic aging. Prereq: Advanced Nutrition or consent of instructor. Su

520 Nutritional Ecology (2) Examination of issues in natural, political, physical, and social environments that impact availability of food and nutrients in the U.S. food supply. F, A

521 Physiological Basis for Diet and Disease (2) Altered nutrient needs as result of metabolic changes that occur in selected disease states. Prereq: Nutrition in Disease or consent of instructor. Sp

522 Nutrition Counseling (2) Individual eating habits and disorders, evaluation strategies for effectiveness of helping process. Prereq: Nutrition in Disease or consent of instructor. F, A

524 Nutrition Education: Principles, Implementation, and Evaluation (3) Conceptual models, principles, application, and evaluation models in nutrition education research. Prereq: 508 or consent of instructor. Su, A

540 Seminar in Nutrition (1) May be repeated. S/NC only. E

541 Research Methods (1) Basic principles of planning, conducting, and interpreting nutrition and foodservice systems administration research. Prereq: Graduate hrs in nutrition and food system administration and statistics. Sp

542 Advanced Experimental Nutrition (2) Application of research principles to individual project using experimental animals. Prereq: coreq or 541. Sp


547 Field Experience (3-9) Experience in food-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/NC only. E

548 Directed Study in Nutrition (1-3) Advanced study in nutrition. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

549 Special Topics (1-3) Recent advances in nutrition. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

600 Doctoral Research and Dissertation (3-15) Pr/Th only. E

602 Advanced Topics in Nutrition Science (1-3) Comprehensive individual study and group discussion of topics related to current problems in nutrition. Prereq: 512 or consent of instructor. May be repeated. E

603 Current Trends in Food and Sociocultural Change (2) Critical evaluation of research. Prereq: 508 or consent of instructor. F, A

Ornamental Horticulture and Landscape Design

(College of Agricultural Sciences and Natural Resources)

MAJOR

Ornamental Horticulture and Landscape Design.................. M.S.

Robert N. Trigiano, Interim Head

Professors:

Albrecht, M. L., Ph.D. ......................... Ohio State

Augé, R. M., Ph.D. ............... Washington State

Cellahan, L. M. (Emeritus), Ph.D. ........ Rutgers

Cramer, G. D., Ph.D. ..................... Ohio State

Graham, E. T. (Emeritus), Ph.D. .......... Penn State

McDaniel, G. L., Ph.D. ............... Iowa State

Samples, T. J., Ph.D. ............. Oklahoma State

Trigiano, R. N., Ph.D. ............. NC State

Williams, D. B. (Emeritus), Ph.D. .... Penn State

Associate Professors:

Day, J. W., Ph.D. ............... Mississippi State

Rogers, S. M., M.L.A ................... Georgia

Starman, T. W. (Liaison), Ph.D. ........ Texas A&M

Witte, W. T., Ph.D. ............... Maryland

Assistant Professors:


Kingerman, W. E., Ph.D. .......... Georgia

Menendez, G. L., M.S. ............. Tennessee

The Department of Ornamental Horticulture and Landscape Design offers the Master of Science degree with concentrations in horticulture, landscape design, turfgrass, woody ornamentals, and public horticulture. Various interests may be emphasized in any of these commodity areas, including micropropagation, innovative production and maintenance systems, and the molecular biology, genetics, ecology and stress physiology of ornamentals.

THE MASTERS PROGRAM

Admission Requirements

Students having bachelor's degrees in fields both related and unrelated to ornamental horticulture may apply, although acceptance may require some prerequisite courses. For admission to the M.S. degree program, a student must meet all of the requirements of The Graduate School and must have completed (in semester hours): 12 hours of upper level general education and/or landscape design (in some cases, depending on individual student's interests and up to the discretion of a major professor in consultation with the OHLD Graduate Coordinator, upper level courses in other agricultural, biological or environmental subjects may substitute for some or all of these hours); 6 additional hours of biological science; 8 hours of math; 8 hours of chemistry. In addition, three completed rating forms and a written statement of career goals and interest in ornamental horticulture are required.

Students from non-science fields applying for the program may wish to enroll as non-degree graduate students while taking prerequisites. Both thesis and non-thesis options are available, each guided by a graduate committee with three or more faculty members. For further information see web site at http://ohld.ag.utk.edu/ or contact the graduate liaison.

Degree Requirements

1. Successful completion of 12 hours of coursework in OHLD at the graduate level (400 or above), exclusive of 500, 502, and 503. Two of these hours must be 590. Six of
GRADUATE COURSES

410 Nursery Management and Production (3) Modern management methods as applied to retail and wholesale nurseries and landscape contracting firms. Methods of producing liners, container and field-grown woody ornamental plants. Prereq: 220, 330, and Plant and Soil Science 210, or consent of instructor. 2 hrs and 1 lab. Sp

426 Public Horticulture (2) In-depth study of public horticulture industry. Diversity of public horticulture institutions, career opportunities, and research. Discussion of current issues and topics. Prereq: Senior standing in OHLD or consent of instructor. Sp

440 Advanced Turfgrass Management (4) Principles and scientific basis of turfgrass culture: adaptation, ecology, physiology, soil fertility, and grass nutrition; climatic influences on turfgrass physiology and clipping and water management; design, construction, and management of golf courses; and physiological influences on construction and control measures. Prereq: 340 or consent of instructor. 3 hrs and 1 lab. Sp

450 Specialty Landscape Construction (3) Methods of design, materials, and construction techniques for specialized components of landscape industry. Irrigation systems, outdoor lighting, garden ponds and water features. Prereq: Basic Landscape Construction. F

451 Plant Tissue Culture (3) (Same as Botany 451.)

460 Professional Practices in Landscape Construction and Management (2) Professionalism, salesmanship, proposals, bidding, estimating, specification, and contract management in landscape services industry. Interaction with industry representatives through special presentations. Prereq: 350 or consent of instructor. F

494 Professional Horticultural Communications (3) Communication for public horticulturists through written, oral and visual media. Communication skills using proper writing techniques and grammar for print media, brochure design using desktop publishing, slide show development, oral presentations, and video for educational and informational presentations in ornamental horticulture. Prereq: Agriculture 290 Microcomputer Applications. F

495 Plant Disease Fungi (4) (Same as Entomology and Plant Pathology 510.)

501 Special Topics in Ornamental Horticulture and Landscape Design (1-3) Topics to be assigned. May be repeated. Maximum 6 hrs. Prereq: Consent of instructor. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses diversity facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E

503 Non-Thesis Project (1-2) Library, field, or laboratory project under supervision of faculty member. Not for thesis candidates. May be repeated. Maximum 4 hrs. E

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Food Science and Technology 507, and Plant and Soil Sciences 507.) S/N/C only. F

509 Scientific Communication (1) (Same as Agriculture and Natural Resources 509, Animal Science 509, Food Science and Technology 509, and Plant and Soil Sciences 509.) F

511 Plant Disease Fungi (4) (Same as Entomology and Plant Pathology 510.)

512 Stress Physiology (1) Introduction to abiotic plant stress physiology: drought, flooding, salinity, light, pollutants, other stresses. Prereq: Introductory Plant Physiology or equivalent. 3 hrs weekly for 5 weeks. Sp,A

522 Stress Physiology (1) Introduction to abiotic plant stress physiology: drought, flooding, salinity, light, pollutants, other stresses. Prereq: Introductory Plant Physiology or equivalent. 3 hrs weekly for 5 weeks. Sp,A

523 DNA Analysis (1) Practical experience in isolating Genomic DNA from plants and fungi, amplification of DNA using arbitrary oligonucleotide primers. DNA profiling techniques (GAP, ACP) isolation and purification of amplified products. Data analysis of relationships between organisms. Prereq: 8 hrs biological/botanical sciences, 8 hrs chemistry, consent of instructor. 1 hr and 4 labs weekly for 5 weeks. Sp,A

524 Protein Gel Electrophoresis (1) Practical experience in isolating native and denatured proteins from plants and fungi; determining protein concentrations, PAGE of proteins including total proteins and assays for specific enzymes (2D PAGE) analysis. Prereq: 8 hrs biological/botanical sciences, 8 hrs chemistry, consent of instructor. 1 hr and 4 labs weekly for 5 weeks. Sp,A

525 Plant Microtechnique (1) Practical light and scanning electron microscopic techniques for investigating aspects of plant development, histochemistry and pathological structures in ornamental forest and crop species. Prereq: 8 hrs biological/botanical sciences and consent of instructor. 1 hr and 4 labs weekly for 5 weeks. Sp,A

526 Public Garden Operations and Maintenance (3) Principles and practices of summer annuals production and installation; aquatics; soil and water management; irrigation system maintenance; spring fertilization programming; vegetative waste management; computer-based record keeping and label development; weed control measures for public spaces, and information dissemination methods for public outreach, using facilities and materials of the UT Institute of Agriculture Gardens. Enrollment limited to 12. Prereq: 220 Basic Landscape Design, 370 Grounds Maintenance, 390 Fall Herbaceous Ornamental Plants, 430 Greenhouse Floral Crop Production or consent of instructor. Sp
hours of coursework of which at least two-thirds must be in courses at or above the 500 level. Students seeking the non-thesis option must pass a final written examination. As a part of the Master’s degree, and in addition to a final comprehensive examination, a culminating (capstone) experience is required.

Examples of culminating experiences include preparing a paper at a refereed national or regional philosophy conference, or preparing a paper at a departmental colloquium.

THE DOCTORAL PROGRAM

Students must hold an M.A. with a major in Philosophy or an equivalent degree when entering the Ph.D. program. Twenty-seven hours of coursework beyond the M.A. is required, of which 6 hours will be in courses numbered above 600. See the Philosophy Department Graduate Student Procedures for specific course requirements.

Students must demonstrate a reading knowledge of one foreign language, normally a living language in which there exists a significant body of philosophical literature. (In special circumstances relating to the area of dissertation research, the Graduate Committee may approve a language not satisfying these conditions.) If not done by passing the doctoral language examination given by the appropriate department, if available, or by passing French 302 or German 332 with a B or better, B- or multilingual (normally, foreign) students, whose native language (other than English) is one in which there is a significant body of philosophical literature, are exempted from the foreign language requirement.

Students receiving the Ph.D. with concentration in medical ethics are also exempted.

CONCENTRATIONS

Medical Ethics

The department has an M.A. and Ph.D. program of graduate study with a concentration in medical ethics. Detailed information concerning the program may be obtained from the Graduate Director of Graduate Studies in Philosophy or the Director of the Medical Ethics Program.

Religious Studies

The department has an M.A. program of graduate study with a concentration in religious studies. Details concerning the program may be obtained from the Director of Graduate Studies in the Department of Religious Studies.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.A. and Ph.D. programs in Philosophy are available to residents of the states of Alabama, Kentucky, or Texas; the Ph.D. program to residents of Louisiana, Mississippi, Virginia or West Virginia; and the M.A. program to residents of Delaware or Oklahoma. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

400 Special Topics (3) May be repeated when topic varies. Maximum 6 hrs.

411 Modern Religious Philosophies (3) (Same as Religious Studies 411.)

420 Topics in History of Philosophy (3) Figures or movements from antiquity through mid-twentieth century. Prereq: 6 hrs of philosophy or consent of instructor. May be repeated when topic varies. Maximum 9 hrs.

435 Intermediate Formal Logic (3) Metatheory of formal logic and philosophy of logic. Prereq: Consent of instructor.

440 Contemporary Ethical Theory (3) Topics in meta-ethics or ethics. Prereq: 6 hrs of philosophy or consent of instructor.

446 Theoretical Issues in Medical Ethics (3) Prereq: 240 or 345 or consent of instructor.

452 Philosophy of Biology (3) Current issues: nature of selection, adaptation, and fitness; level of selection debate; nature of species; interaction of environment and organism, and others. Prereq: upper division coursework in philosophy or biology or consent of instructor.

472 Philosophy of Language (3) Problems of meaning, reference and truth. Relation between words and world. How sentences make up about the world. What is true? Prereq: 3 philosophy courses 200 level or above.

473 Philosophy of Mind (3) Problems of mind and body in relation to consciousness and personal identity. Prereq: 6 hrs of philosophy or consent of instructor.

479 Studies in Recent Continental Philosophy (3) Selected thinkers or topics: existentialism, phenomenology, hermeneutics, structuralism, post-structuralism. Prereq: 6 hrs of philosophy or consent of instructor. May be repeated when topic varies. Maximum 9 hrs.

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when University facilities and/or faculty time before degree is completed. May be repeated. S/NC only. E

510 Philosophical Research (3) Paper workshop (writing, revising papers, getting papers ready to publish). Does not count toward hours required for degree. May be repeated. S/NC only.

520 Topics in Ancient or Medieval Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

522 Topics in Modern Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

524 Topics in Twentieth-Century Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

528 Topics in Contemporary Philosophy (3) Intensive critical work on themes in late 20th-century philosophy. May be repeated. Maximum 9 hrs.

540 Topics in Ethics or Value Theory (3) May be repeated. Maximum 9 hrs.

542 Topics in History of Ethics (3) Dominant movements in the history of ethics. May be repeated. Maximum 9 hrs.

544 Topics in Applied Ethics (3) Single author, tradition, or topic in ethical theory, application to issues in health, business, technology, ecology, and other practical fields. May be repeated. Maximum 9 hrs.

546 Orientation to Medical Ethics (3) Survey of ethical theories in application to issues in medical ethics.

547 Ethical Issues in Mental Health (3) Values in "mental health" and "mental illness," informed consent in psychiatry, competence, patients' rights, involuntary hospitalization and treatment, and behavior control therapies.

548 M.A. Clinical Practicum (3) Series of clinical rotations at one or more local health care institutions. Open only to graduate students concentrating in medical ethics. Prereq: 547 and consent of Medical Ethics Committee and the UTMC Graduate Education Committee.

575 Topics in Metaphysics and Epistemology (3) May be repeated. Maximum 9 hrs.

577 Topics in Philosophy of Mind (3) Relation of mental to physical and of role of words in discourse for mental activities, thinking and feeling. May be repeated. Maximum 9 hrs.

585 Special Topics (3) May be repeated. Maximum 9 hrs.

587 Advanced Clinical Medical Ethics (3) Critical concepts in medical ethics, relationship of theory to practice, and professional roles and responsibilities for health care ethics consultant. Open only to Ph.D. students concentrating in medical ethics. Prereq: Consent of Medical Ethics Committee.

588 Ph.D. Clinical Practicum (3) Series of clinical rotations at one or more local health care institutions. Open only to Ph.D. students concentrating in medical ethics. Prereq: 587 and consent of Medical Ethics Committee and the UTMC Graduate Education Committee.

590 Topics in Social and Political Philosophy (3) Philosophical problems concerning social and political life: family, state, freedom, justice, major theoretical responses: anarchism, social contract, Marxism. May be repeated. Maximum 9 hrs.

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

600 Doctoral Research and Dissertation (3-15) P/NP only. E

620 Topics in Ancient or Medieval Philosophy (3) May be repeated. Maximum 9 hrs.

622 Topics in Modern Philosophy (3) May be repeated. Maximum 9 hrs.

640 Topics in Ethics or Value Theory (3) May be repeated. Maximum 9 hrs.

644 Topics in Applied Ethics (3) Prereq: Consent of Medical Ethics Committee. May be repeated. Maximum 9 hrs.

675 Topics in Metaphysics and Epistemology (3) May be repeated. Maximum 9 hrs.

Physics and Astronomy

(College of Arts and Sciences)

DEGREES

MAJOR

Physics........................................M.S., Ph.D.

Lee Riedinger, Head

Professors:

Barnes, F. E., Ph.D..........................California

Bingham, C. R., Ph.D..........................Tennessee

Blass, W. E., Ph.D..........................Michigan State

Breinig, M., Ph.D..........................Oregon

Bugg, W. M., Ph.D..........................Tennessee

Burgdoerfer, J. (Distinguished Prof.), Ph.D..........................Frie Universitat Berlin
Graduate programs leading to the Master of Science and Doctor of Philosophy are offered in a number of concentration areas: astrophysics, atomic and low temperature physics, biophysics, chemical physics, condensed matter and surface physics, elementary particle physics, geophysics (Master's only), health physics (Master's only), molecular spectroscopy, nuclear physics, and theoretical physics.

Departmental graduate programs leading to the M.S. and Ph.D. are also available at The University of Tennessee Space Institute, Tullahoma, where opportunities for study and research are available in quantum optics and laser physics, atomic and molecular spectroscopy, solid-state physics and theoretical physics. For additional information, contact the department head.

ADMISSION REQUIREMENTS

A student who enrolls in The Graduate School with the intention of attaining an advanced degree in Physics will have completed an undergraduate major in Physics or its equivalent. Physics 311-12, 321, 361, 431-32, 421, 461, and 411-12 constitute the minimum courses prerequisite to graduate study.

A student who intends to present Physics as a graduate minor will have completed an undergraduate minor in Physics or its equivalent. Physics 311 and 431-32 constitute the minimum coursework prerequisite to a minor in Physics.

All first-year graduate students are required, for advising purposes only, to take a qualifying examination in undergraduate physics during the fall semester registration period.

THE MASTER'S PROGRAM

Thesis Option

This program is designed primarily for students intending to go into industrial or governmental laboratories as physicists. The course requirements include 24 semester hours of physics courses, which at least 12 semester hours are taken from Physics 511-12, 521-22, 531-32, 541-42, or 571-72. Each candidate must present an acceptable thesis, 6 hours of 500, and pass an oral examination on course material and thesis.

Non-Thesis Option

This program is designed primarily for students intending to teach in colleges or universities on the elementary or intermediate level, or for students specifically intending to work toward a Ph.D. Students seeking the non-thesis option must apply to the department's graduate committee for permission to enroll under this program. The requirements are the satisfactory completion of 30 hours of coursework composed of 18 semester hours from Physics 511-12, 521-22, 531-32, 541-42, and 571-72; 6 semester hours in a minor field; and 6 semester hours from other courses numbered above 400 (preferably of advanced laboratory nature). At least 20 hours must be taken at the 500 level or above. In addition, the candidate must pass a written examination administered by his/her committee.

THE DOCTORAL PROGRAM

Astronomy

Graduate Courses

411 Astrophysics (3) Development of analytical physical models of galactic structure, stellar and interstellar matter, and planetary systems. Topical and interdisciplinary, consideration of quasars, pulsars, black holes, and other astronomical objects. Prerequisite: Physics 411-12.

421 Modern Optics (4) Transmission of light in uniform, isotropic media; reflection and transmission at interfaces; mathematics of wave motion and interference effects. Rudiments of Fourier optics and holography. Prerequisite: Physics 421 or Physics Majors or Fundamentals of Physics: Modern Physics or equivalent. Mathematics 435.


Physics

Graduate Courses

THE MASTER'S PROGRAM

The M.S.P. requires completion of at least 48 hours of graduate credit, at least 30 of which must be in planning. The following courses are the core curriculum required of all students: 510, 511, 512, 515, 520, 521, 530, 531, 532, 540 and 570.

Students should plan to enter the program in the fall term to take core courses in the proper sequence.

Each student is required to develop an area of concentrated competence beyond the core curriculum. After selecting the area of concentration, usually by the end of the second semester, the student takes a minimum number of courses or hours from a prescribed set of courses in the subject area. Further enhancement of the concentration is gained by focusing the thesis or major study on the subject. Concentration courses are drawn from the planning curriculum and from other departments in the University. Concentrations are available in land use planning, environmental planning, real estate development planning, and transportation planning.

Students have the latitude to propose an alternate specialization consisting of at least 9 hours of coursework, subject to approval of a faculty committee. Each student is required to demonstrate competence in individual research. This may be done in one of two ways:

**Thesis Option**—Complete a thesis for 6 hours credit.

**Non-Thesis Option**—Complete a major study with acceptable documentation. To be eligible for the major study option, the student must have completed at least 12 hours of graduate coursework in planning with at least a 3.5 cumulative grade-point average. The student meeting these criteria may present a proposal to his/her committee for a major study that will include at least 6 hours of subsequent coursework. The proposal shall justify the selection of the topic, describe the approach to the study, and describe the nature of the final product. The topic will normally be expected to reinforce or complement the student's concentration.

A successful completion of a comprehensive exam is required before graduation. The exam will normally be given after completion of the core requirements in the major field. Based on the material generally used by the American Institute of Certified Planners (AICP), this requirement provides an additional capstone experience as well as preparation for meeting AICP professional certification requirements.

Student academic progress is monitored by the faculty. A student failing to maintain an acceptable grade-point average may be placed on probation or dismissed from the program.

**MINOR IN ENVIRONMENTAL POLICY**

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an out-of-state tuition basis. The M.S.P. program is available to residents of the states of Arkansas, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

401 The City in the U.S. (3) Development and character of U.S. cities. Contemporary issues and selected case studies. (Same as Urban Studies 401.)

402 Survey of Planning (3) History of city development of planning. U.S. experience in urban and other levels of planning. State of the art, process, comprehensive plan, implementation devices, Planning issues in society. Not for credit for M.S.P. degree.


500 Thesis (1-15) PNP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

510 Fundamentals of Planning (2) Planning process, policy process and development process. Field reconnaissance of study community and development of approaches for assessing community.

515 Theory of Planning (2) Analysis of nature and objectives of planning process; role of planner and planning function in public decision-making. Prereq. 510 or consent of instructor.

520 Planning Research Methods (3) Overall structuring of social science research in planning practice; familiarity with structure of planning literature information sources, systematic retrieval techniques, processes and tools, practice in posing research questions relevant to planning.

521 Information Systems and Networks in Planning (3) Use and impact of computer-based information systems and global networks in planning and public management. Development of practical skills in design of planning decision support systems, databases, Internet based tools and geographic information systems (GIS). Prereq: Basic experience with computer software and hardware or consent of instructor.

523 Statistics for Planners (3) Applications of statistical techniques. Intuitive explanations and practical applications. Computer analysis to explore concepts.

525 Planning Information Systems (3) Design, analysis, and use of information systems in planning and public management. Design of planning decision support systems; use of public databases; impact of information revolution and new technologies on planning profession. Prereq: Consent of instructor.

530 Policy and Land Use Analysis (4) Basic methods of policy analysis and planning. Concept and framework for land-use planning. Population, employment, and economic base studies, and forecasting techniques. Coreq: 520 or consent of instructor.

531 Urban and Regional Analysis (3) Past, present and possible future patterns of urban and regional structures drawing on contemporary theories, models, and empirical research.

532 Planning Methods (4) Preparation of comprehensive plans for urban areas or regions. Development of baseline data and forecasts; formulates of alternative plans and strategies, and development of plans implementation programs. Extensive laboratory experience. Prereq: 510, 512, 520, 530 and 531 or consent of instructor.
537 Planning and Transportation (3) (Same as Civil Engineering 558.)

538 Urban and Site Design (3-6) Principles of design of residential subdivisions and some components of physical community, shopping centers, institutional complexes, central business districts. Problems of reviewing and designs against each other or written regulations. Extensive laboratory experience.

539 Planning for Historic Preservation (3) Planning for preservation, restoration, and conservation of historic buildings, areas and sites as related to comprehensive planning process. National, state, and local government role in preservation, designation of sites, legislative needs, financing and administrative organizations.

540 Legal Aspects of Planning (3) Legal basis for planning and guiding community development. Legal tools of planning. Prereq: S10 or consent of instructor.

543 Cultural Resources Planning (3) Cultural characteristics creating identity and spirit of place; role in environmental and land-use planning; use in protection of natural environment and cultural heritage. Cultural components of National Environmental Protection Act and case studies.

545 Planning and Property Development (2) Process of urban physical growth and change; functioning of private sector in real estate development and its relationship to planning. Partnership roles of public and private sectors in urban development and redevelopment. Prereq: $10 or consent of instructor.

547 Negotiation (1) Methods, strategies, techniques and skills useful to planners in mediation, negotiation, and dispute resolution concerning urban planning and development.

548 Tourism Planning (3) Planning of tourist resources and programs within a geographic region. Tourism planning models. Relationships among tourists, tourism developments and planning of tourist attractions and services. Application of techniques in selected area.

549 Local Fiscal Planning and Capital Improvements (3) Fiscal concepts and capital improvements programming in plan implementation. Tax and expenditure limitations, infrastructure financing, municipal bond market, alternative revenue sources, development fees, exactions, intergovernmental aid. Evaluation of fiscal policies.


551 State and Regional Planning (3) Theory and practice of planning at state, sub-state, and metropolitan levels.

552 Development Planning in the Third World (3) Seminar on urban and regional development in Third World nations. Population growth, settlement patterns, economic development, land framework of integrated resource management. (Same as Ecology and Evolutionary Biology 562.)

555 Environmental Planning (3) Role of planners and planning in maintenance of balance between nature and built environment. (Same as Ecology and Evolutionary Biology 555.)

560 Strategic Planning & Policy Development (3) Models of strategic planning and process of policy development in applied decision making. Qualitative approaches, program evaluation and impact assessment.

570 Plan Implementation Process (1) Interactive community and environmental dynamics in plan implementation. Dynamics of change, conflict, resolution and consensus building.

590 Practicum (3) Prereq: Consent of instructor. S/NC or letter grade.

591 Special Topics (1-3) Prereq: Consent of instructor. May be repeated.

592 Readings in Planning (1-3) Prereq: Consent of instructor. May be repeated.

593 Problems in Planning (1-3) Prereq: Consent of instructor.

538 Environmental Assessment and Sustainable Development in Third World Countries (3) (Same as Ecology and Evolutionary Biology 635 and Botany 665.)

Plant and Soil Sciences

(College of Agricultural Sciences and Natural Resources)

<table>
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<tr>
<th>MAJOR</th>
<th>DEGREES</th>
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<tbody>
<tr>
<td>Plant and Soil Sciences</td>
<td>M.S., Ph.D.</td>
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FRED L. ALLEN, Head

Professors:

Allen, Fred L., Ph.D. ......... Minnesota
Ammon, J. Tom, Ph.D. ......... West Virginia
Bell, Frank F. (Emeritus), Ph.D. ......... Iowa State
Coffey, David L., Ph.D. ......... Purdue
Conger, Bob V. (Distinguished Prof.), Ph.D. ......... Washington State
Deyton, Dennis E., Ph.D. ......... NC State
Foss, John E. (Emeritus), Ph.D. ......... Minnesota
Fribourg, Henry A., Ph.D. ......... Iowa State
Hayes, Robert M., Ph.D. ......... Illinois
Howard, Donald D., Ph.D. ......... Auburn
Lewis, Russell J. (Emeritus), Ph.D. ......... NC State
Mullins, Charles A., Ph.D. ......... Tennessee
Parks, William L. (Emeritus), Ph.D. ......... Purdue
Reynolds, John H., Ph.D. ......... Wisconsin
Sam, Carl E., Ph.D. ......... Michigan State
Springer, Maxwell E. (Emeritus), Ph.D. ......... California
Swingle, Homer D. (Emeritus), Ph.D. ......... Louisiana State
Tyler, Donald D., Ph.D. ......... Kentucky
West, Dennis R., Ph.D. ......... Nebraska

Associate Professors:

Essington, Michael E. (Liaison), Ph.D. ......... California (Riverside)
Gwathmey, C. Owen, Ph.D. California (Davis)
Lessman, Gary M., Ph.D. ......... Michigan State
Logan, Joanne, Ph.D. ......... Nebraska
Mueller, Thomas C., Ph.D. ......... Georgia
Mullen, Michael D., Ph.D. ......... NC State
Reich, Vernon H., Ph.D. ......... Iowa State
Wyatt, Jim E., Ph.D. ......... Florida

Assistant Professors:

Gale, Paula M. (UT Martin), Ph.D. ......... Arkansas

Research Professors:

Lee, S. Y., Ph.D. ......... Wisconsin
Miller, Robert D., Ph.D. ......... Kentucky

Research Assistant Professor:

Pantalone, Vincent R., Ph.D. ......... NC State

The Department of Plant and Soil Sciences offers graduate programs leading to the Master of Science and the Doctor of Philosophy. Concentrations for the graduate programs are offered in soil science, plant breeding and genetics, and crop physiology and ecology. For further information, contact the department head.

THE MASTER'S PROGRAM

Thesis Option

A thesis is based on original research is required. A graduate advisory committee will be assembled at the beginning of the student's program. The committee consists of the major professor, who acts as chair of the committee, and at least two other faculty members. Prior to conducting research, the student must develop a detailed written research proposal that shall be approved by the student's committee. Upon completion of the thesis, this committee will also conduct the final oral examination that integrates the thesis and coursework.

Six hours of 500 level courses are required. In addition to the thesis, 24 hours of graduate coursework is required. At least 14 of these hours must be taken in courses numbered 501 and above. The student must take at least 12 of the 24 hours in Plant and Soil Sciences courses, excluding 500. The student's committee may require additional coursework beyond the 24 hours if the student's progress or background indicates a need or deficiency. All students pursuing the M.S. degree must take the following courses: 509 Scientific Communication (1 hr); 503 Seminar (1 hr); 511 Soil-Plant Relations (3 hrs). The student must also present an oral seminar to the Department over the research project.

All students pursuing a concentration in soil science must take at least three of the following courses: 512, 513, 514, and 516. All students must take at least 12 hours of 501 and above in Plant and Soil Sciences courses, excluding 500. A student who has started a degree under the thesis option is not eligible to transfer to the non-thesis option after the end of the first semester of graduate studies or after receiving a graduate assistantship stipend for more than one semester. A student who has started under the non-thesis option may transfer to the thesis option upon approval of a potential major professor and the department head.

Non-Thesis Option

A student desiring the non-thesis option should declare this intention at the beginning of the first semester of graduate studies, and must declare it before the beginning of the second semester. In lieu of a thesis, students are required to complete three hours of 593 for satisfactory participation in a single research program for a period of 12 weeks and the writing of an original, creative, and well-written report.

A graduate advisory committee will be assembled at the beginning of the student's program. The committee consists of the major professor, who acts as chair of the committee, and at least two other faculty members. This committee approves the student's plan of study and the participation and report on research activity from 593. In addition, this committee administers and evaluates a comprehensive written examination that serves to integrate the student's coursework.

In addition to three hours of 593, a minimum of 30 hours of graduate coursework is required. At least 20 hours must be taken in courses 501 or above.
412 Soil Genesis and Classification (3) Soil genesis and formation processes; soil classification and mapping. Prereq: Soil Science. 2 hrs and 1 lab. F

413 Environmental Soil Chemistry (3) Composition and chemical properties of soils and processes that act on them. Prereq: Soil Science. F

414 Soil, Land Use, and the Environment (3) Soil as an environmental component and its role in land use planning. Prereq: Soil Science. F

415 Soil Hydrology (3) Physical properties of soils; water movement and transport through soil systems. Prereq: Soil Science. 2 hrs and 1 lab. F

431 Physiology and Ecology in Agroecosystems (3) Plant physiology and ecology applied to crop production and management. Prereq: Soil Science and Ecology. 2 hrs and 1 lab. F

432 Bioclimatology (3) Basic principles of climatology, with emphasis on climate and weather in agricultural systems. Prereq: Soil Science. 2 hrs and 1 lab. F

433 Agricultural Pesticides (3) Regulation of pesticide development, manufacture, transportation, and use. Prereq: Soil Science. 2 hrs and 1 lab. F

434 Fruit and Vegetable Crops (3) Principles of production systems to counter environmental stresses. Prereq: Soil Science. 2 hrs and 1 lab. F

435 Field and Forage Crops (3) Agronomic principles of crop production and management. Prereq: Soil Science. 2 hrs and 1 lab. F

453 Principles of Plant Breeding (3) Principles and techniques used in plant improvement. Prereq: General Genetics. 2 hrs and 1 lab. F

512 Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: Soil Science. 2 hrs and 1 lab. Sp, A

513 Advanced Soil Chemistry (3) Chemical properties and processes of soil in agroecosystems, soil formation, mineral solubility, and soil organic matter. Prereq: Soil Science. 2 hrs and 1 lab. Sp, A

514 Advanced Soil Physics (3) Theory and mathematical description of soil and solution transport in saturated-unsaturated soil systems. Prereq: Soil Science. 2 hrs and 1 lab. Sp, A

516 Soil Biology and Biochemistry (3) Soil organisms and their role in soil formation, soil organic matter cycling, and soil ecosystem processes. Prereq: Soil Science. 2 hrs and 1 lab. Sp, A

530 Integrated Pest Management (3) Integrated pest management strategies in agriculture. Prereq: Soil Science. 2 hrs and 1 lab. F

532 Environmental Crop Physiology and Ecology (3) Principles of crop physiology and ecology in relation to crop improvement and environmental sustainability. Prereq: Soil Science. 2 hrs and 1 lab. F

536 Ecology of Grazing Land Systems (3) Multi-disciplinary approach to the study of grazing land ecosystems. Prereq: Soil Science. 2 hrs and 1 lab. F

551 Organizational Genomics (3) The study of the organization of genomes in plants. Prereq: General Genetics. 2 hrs and 1 lab. F

571 Design and Analysis of Biological Research (3) Principles of statistical methods and experimental design in biological research. Prereq: General Statistics. 2 hrs and 1 lab. F

580 Special Problems in Plant Science (1-3) Prereq: Consent of instructor. 1-3 hrs. F, Sp

599 Scientific Communication (1) Presentation and discussion of scientific material. Prereq: Consent of instructor. 1 hr. F

600 Doctoral Research and Dissertation (3-15) Prereq: Consent of instructor. 3-15 hrs. F, Sp

610 Special Topics in Soil Science (1-3) Special topics in soil science, including soil properties, soil survey, and soil mapping. Prereq: Consent of instructor. 1-3 hrs. F

631 Plant-Soil Relationships (3) Principles of mineral nutrition and plant responses to environmental conditions. Prereq: Consent of instructor. 3 hrs. F, Sp

632 Microclimatology of agroecosystems, plant growth and responses to stress, physiology of crop growth and reproduction. Prereq: Consent of instructor. 3 hrs. F, Sp

633 Plant-Soil Relationships (3) Principles of mineral nutrition and plant responses to environmental conditions. Prereq: Consent of instructor. 3 hrs. F, Sp

634 Soil-Plant Relations (3) Principles of mineral nutrition and plant responses to environmental conditions. Prereq: Consent of instructor. 3 hrs. F, Sp

635 Soil-Plant Relations (3) Principles of mineral nutrition and plant responses to environmental conditions. Prereq: Consent of instructor. 3 hrs. F, Sp
and germplasm in crop production, theory and application
of quantitative methods in crop physiology and
ecology research. May be repeated. Maximum 6 hrs.
E
605 Special Topics in Plant Breeding and Genetics
(1-3) Genotype by environment interactions, estima-
tion of quantitative parameters, mutations, chromo-
some dynamics, polyploidy, genetic engineering,
interspecific hybridization, linkage, screening methods,
genome organization. May be repeated. Maximum 6 hrs.
E
613 Advanced Topics in Soil Chemistry and Fertil-
ity (2) Topics of current significance, scientific litera-
ture. Prereq: 513 or equivalent. Sp,A
614 Advanced Topics in Soil Biology and Biochem-
istry (2) Topics of current significance, scientific
literature. Prereq: 516 or equivalent. F,A
615 Advanced Topics in Soil Physics, Genesis, and
 Morphology (2) Topics of current significance, scien-
tific literature. Sp,A
633 Plant Metabolism (3) Metabolism of chemical
compounds of economic importance in crop produc-
tion; plant growth regulators, naturally occurring plant
metabolites, and herbicides. Prereq: Botany 521 or 522
and organic chemistry or biochemistry. Sp,A
653 Advanced Plant Breeding (4) Development and
utilization of concepts of quantitative parameters,
introgressing heterosis, methods of selection, in vitro
breeding, interspecific hybridization, stability parame-
ters, genetic resistance and vulnerability to pests and
environmental stresses. Prereq: 453 and 571 or equiva-
lent or consent of instructor. 3 hrs and 1 lab. Sp,A

Political Science
(7 College of Arts and Sciences)

MAJORS DEGREES
Political Science .................. M.A., Ph.D.
Public Administration .......... M.P.A., J.D.-M.P.A.

Patricia Freeland, Head

Professors:
Cunningham, Robert B., Ph.D. .......... Indiana
Fitzgerald, Michael R., Ph.D. .......... Oklahoma
Freeland, Patricia K. ................. Wisconsin (Milwaukee)
Gant, Michael M., Ph.D. .......... Michigan State
Gorman, Robert A., Ph.D. .......... New York
Lyons, William D., Ph.D. .......... Oklahoma
Peters, John, Ph.D. ................. Illinois
Plea, Hyram, Ph.D. ................. Utah
Scheib, John M., II, Ph.D. .......... Florida
Smith, T. Alexander, Ph.D. .......... Ohio State
Stephens, Otis H. (Distinguished Prof.)
Ph.D. .................................... Johns Hopkins
Turk, Thomas D. (Emeritus), Ph.D. .... Iowa
Weltorn, David M. (Emeritus), Ph.D. .... Texas

Associate Professors:
Folz, David H. (Liaison), Ph.D. ...... Tennessee
Houston, David J., Ph.D. .......... SUNY (Binghamton)
Nowness, Anthony J., Ph.D. .......... Kansas
Peterson, Robert L., Ph.D. .......... Yale
Zhong, Yang (Liaison), Ph.D. .......... Kentucky

Assistant Professors:
Kelly, Janet, Ph.D. .......... Wayne State
Van Cott, Donna, Ph.D. .......... Georgetown

The Department of Political Science offers the M.A., M.P.A., and Ph.D. The department also offers a dual program with the College of Arts and Sciences.

of Law. Inquiries concerning all programs should be directed to the departmental office.

ADMISSION REQUIREMENTS

Three departmental recommendation forms must be submitted to The Graduate School, at least two of which must be completed by instructors at the institution most recently attended. In addition, scores on the general portion of the Graduate Record Examination must be submitted.

THE MASTER OF ARTS PROGRAM

A Bachelor's degree or its equivalent is required for admission. Normally an overall average of 3.0 is also required together with an average of 3.2 in the last two years of political science or social science. In addition, a composite score of at least 1100 on the verbal and quantitative parts of the GRE is normally required.

Students pursuing the Master of Arts degree may follow one of two options:

Thesis Option: (30 hours) Coursework, preparation of a thesis, and an oral examination on coursework and the thesis, is required. At least 12 of these hours must be in political science, with 6 in the field of methodology (Political Science 510 and either 511 or 512). Six hours may be earned through thesis credit.

Non-Thesis Option: (36 hours) Coursework, plus a written comprehensive examination on all coursework is required. At least 12 of these hours must be in political science, with 6 in the field of methodology (Political Science 510 and either 511 or 512), and 3 hours in the 600-level research seminar in the student's first field of interest.

THE MASTER OF PUBLIC ADMINISTRATION PROGRAM

The MPA program is intended to prepare students for public service careers by acquainting them with management principles, analytical tools, and ethical dilemmas they will face as public administrators. It consists of a total of 39 semester hours, including a core program, an elective specialization and a recommended internship.

Applicants for admission to the program must have a Bachelor's degree and its equivalent. Normally, an overall average of 3.0 and an average of 3.2 in the last two years of political science or social science courses is required. In addition, a composite score of at least 1100 on the verbal and quantitative parts of the GRE is normally required.

Students must demonstrate proficiency in the use of software applications for the personal computer. This requirement can be fulfilled by achieving a satisfactory grade in Political Science 596, Workshops in Computer Applications. Exceptions to this requirement will be considered on an individual basis.

The MPA is a non-thesis program requiring 39 hours. Specific requirements include the following:

1. Core Curriculum (24 hours)
   a. General perspectives (9 hours) - 550 Political Science
   b. Quantitative Political Analysis; 514 Research and Methodology in Public Administration
   c. Management skills (9 hours) - 560 Public Budgeting and Finance; and any two of the following: 562 Public Management; 554 Human Resources Management; 556 Policy Analysis

2. Specialization (9 hours)
   A specialization is designed by the student in consultation with the coordinator of the MPA degree program. Possible specializations include general government, public health, budgeting and finance, planning, natural resources, program evaluation, criminal justice, public relations, personnel, and others.

3. Recommended Internship (6 hours) Internships are arranged in consultation with the coordinator of the MPA degree program.

4. Final Examination
   A written final examination, which may be followed by an oral examination, is required.

DUAL J.D.-M.P.A. PROGRAM

The College of Law and the Department of Political Science in the College of Arts and Sciences offer a coordinated dual degree program leading to the conferral of both the Doctor of Jurisprudence and Master of Public Administration degrees. In this program, a student may earn the MPA and J.D. degrees in about four years rather than the five years that otherwise would be required. Students pursuing the dual degree program should plan to be enrolled in coursework or an internship for one summer term in addition to taking normal course loads for four academic years.

Admission

Applications for the J.D.-MPA program must make separate application to, and be independently accepted by, the College of Law for the J.D. degree and the Department of Political Science and The Graduate School for the MPA degree. Applicants must also be accepted by the Dual Degree Committee. All applicants must submit a Law School Admission Test (LSAT) score. An applicant's LSAT score may be substituted for the Graduate Record Examination (GRE) score, which is normally required for admission to the MPA program. Application may be made prior to or after matriculation in either the J.D. or the MPA program, but application to the dual program must be made prior to entry into the last 29 semester hours required for the J.D. degree and prior to entry into the last 15 hours required for the MPA degree.

Curriculum

A dual degree candidate must satisfy the requirements for both the J.D. and the MPA degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The MPA program will award a maximum of 9 semester hours of credit toward the MPA degree for successful completion of
approved courses offered in the College of Law. All courses for which such cross-credit is awarded must be approved by the J.D.-M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

1. During the first two years in the dual program, students will spend one academic year completing the required first year of the College of Law curriculum and one academic year taking courses solely in the M.P.A. program. During those first two years, students may not take courses in the opposite area, without the approval of the J.D.-M.P.A. coordinators in both academic units. In the third and fourth years, students are encouraged to take both law and political science courses each semester. Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

**Awarding of Grades**

For grade recording purposes in the College of Law and the Department of Political Science, grades awarded in courses in the other unit will be converted to either Satisfactory or No Credit and will not be computed in determining a student's GPA or class standing. The College of Law will award a grade of Satisfactory for an approved M.P.A. course in which the student earns a grade of B or higher and a grade of No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of 2.0 or higher and a grade of No Credit for any lower grade. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

**THE DOCTORAL PROGRAM**

The Ph.D. program prepares students for careers in college teaching, as well as careers in other occupations related to service in the public or private sectors. Applicants for admission to the program normally have completed a master's degree in political science, as well as training in a related field with at least 3.5 GPA in all graduate work. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

1. During the first two years in the dual program, students will spend one academic year completing the required first year of the College of Law curriculum and one academic year taking courses solely in the M.P.A. program. During those first two years, students may not take courses in the opposite area, without the approval of the J.D.-M.P.A. coordinators in both academic units. In the third and fourth years, students are encouraged to take both law and political science courses each semester. Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

**MINOR IN ENVIRONMENTAL POLICY**

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

**GRADUATE COURSES**

430 United States Constitutional Law: Sources of Power and Restraint (3) Analysis of judicial review, constitutional powers of President and Congress, federalism, sources of regulatory authority, and constitutional protection of political and economic rights.

431 U.S. Constitutional Law: Civil Rights and Liberties (3) Analysis of current issues in civil rights and liberties including: first amendment freedoms, equal protection, privacy, and rights of accused.

435 Criminal Law and Procedure (3) Substantive and procedural law in criminal justice field, constitutional questions and public policy issues.

442 Administrative Law (3) Legal dimensions of administrative power and procedures, and constitutional controls over administrators.

452 Black African Politics (3) Recent evolution and current political environment of Black African nations. (Same as Afro-American Studies 452.)

454 Government and Politics of China and Japan (3) Examination of the political setting, structure and political processes in China and Japan.

456 Government and Politics of the Soviet Union (3) Origins and development of Soviet political system, and study of selected policy areas.

461 Policy Making in Democracies (3) Comparative approach to theory and process of making public policies.

463 Contemporary Middle East Politics (3) Government and politics in the Middle East, their characteristics, bases, and interrelationships.

470 International Law (3) Nature and development of international law and compliance. Function of international law in context of international conflict.

475 Ancient and Medieval Political Thought (3) Survey of major western political thinkers from Socrates to Marsilius of Padua.
628 Topics in Political Theory (3) Selected issues and problems in normative political theory. Specific content determined by instructor. May be repeated with consent of instructor. Maximum 9 hrs.

639 Special Topics in American Government and Politics (3) Advanced study of selected topics. May be repeated with consent of instructor. Maximum 9 hrs.

640 Special Topics in U.S. Constitutional Law (3) Systematic analysis of published research and judicial decisions on development of constitutional law as major component of public policy. May be repeated with consent of department. Maximum 9 hrs.

650 Public Budgeting and Finance (3) Technical and political aspects of planning, preparing and adopting government budgets. Management implications of revenue collection, debt management, treasury function, accounting, internal auditing, purchasing risk management, post-audit.

652 Public Management (3) Interpersonal and leadership skills, techniques and methods for planning, decision making, and implementation of management strategies in public sector. May be repeated with consent of department. Maximum 9 hrs.


656 Ethics, Values, and Morality in Public Administration (3) Moral, ethical, value dilemmas confronting administrators in American political system.

659 Internship in Public Administration (3-9) Open to students participating in approved internship programs. May be repeated with consent of department. Maximum 9 hrs. S/NC only.

670 Comparative Government and Politics (3) Selected topics in modern governments. May be repeated with consent of department. Maximum 9 hrs.

672 The Politics of Development (3) Selected topics dealing with political problems of less developed countries. May be repeated with consent of department. Maximum 9 hrs.

674 Area Seminar in Comparative Government and Politics (3) Selected topics in area studies; African, Asia, Latin America, Middle East, Soviet Union and Eastern Europe or Western Europe. May be repeated with consent of department. Maximum 9 hrs.

580 International Politics (3) Survey of literature and major aspects of international politics. May be repeated with consent of department. Maximum 9 hrs.

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

594 College Teaching in Political Science (1) Instructional effectiveness, techniques, organization, materials for teaching political science at college level. Prereg: Consent of instructor. S/NC only.

595 Readings and Special Problems in Political Science (1-3) Selected topics. Consent of instructor. May be repeated. Maximum 15 hrs.

596 Workshops in Computer Applications (1) Training in software applications to support research and decision making tasks in public service. Successful completion certifies proficiency of IPA students in use of software applications for personal computer. S/NC only.

600 Doctoral Research and Dissertation (1-15) Pr: Not open to graduate students. Independent study in experimental psychology. This course is appropriate for students who desire a master's degree as part of their progress toward a doctorate or for those who wish to complement a degree in a different field.

Admission

Any student with a B.A. or B.S. may apply to the Department of Psychology for admission to the master's program. All students must also submit scores from the Graduate Record Examination (general and subject).

Major Advisor and Committee

Initially, the Director of Experimental Psychology will advise the student. As soon as possible, the student must select an advisor and obtain his or her approval for registration. Subsequently, the advisor and student will select two additional faculty members to comprise the student's master's committee. Final approval comes from the Graduate Dean, upon recommendation by the Department Head.

Program Requirements

All students must complete 30 semester hours of graduate level courses in psychology. These hours must include 504-05, or Statistics 531-32 or an equivalent sequence; 565 or 420; six semester hours of Thesis 500; and twelve hours of 500- or 600-level foundations courses. Students must earn a grade of B or better in all courses that are to count toward the 30-hour total. Students must also propose, conduct and successfully defend an original piece of research in the form of a master's thesis.

THE DOCTORAL PROGRAM

A student with a B.A. or B.S. may apply to the Department of Psychology for admission to the doctoral program with a concentration in experimental psychology or clinical psychology. The doctoral program with a concentration in ethnology is offered through the Life Sciences program. Doctoral study in industrial and organizational psychology is offered through the Intercollegiate program in Industrial and Organizational Psychology, to which application is made through the Department of Management.
**Experimental Psychology**

The Ph.D. program in Psychology with a concentration in experimental psychology is designed to allow students to select from a variety of specializations oriented toward careers in research, teaching, and application of psychology in academic, institutional, or industrial settings. The program is flexible, individualized, and emphasizes a professional apprenticeship model of training. A full description of the program is given in the "Handbook for Students in Experimental Psychology," available from the department.

The basic requirements are:

1. Twelve semester hours of statistics and research (504-05 or Statistics 531-32 or equivalent and 6 additional hours in research methods or design).
2. Fifteen semester hours in experimental psychology (585 or equivalent and 4 courses from the following: 510, 511 or 512, 513, 543, 546 or 547, 550, 560, and 570 or 571).
3. Six semester hours of research practicum (509).
4. Psychology 528 - preparation for college teaching.
5. Two 600-level graduate seminars.
6. Six semester hours of graduate level courses outside the Psychology Department.
7. Predissertation research project involving the collection of original data or the original analysis of existing data, reported in publishable form and accepted by the student's advisory committee.
8. Comprehensive examination, determined and evaluated by the student's doctoral committee. This examination is comprised of an integrative review or theoretical paper and an oral exam or additional questions.
9. Twenty-four hours of dissertation research (600).
10. An original piece of research in the form of a doctoral dissertation, proposed, conducted, and defended.

**Clinical Psychology**

This program is designed to lay the groundwork for a career as a clinical psychologist capable of working in both academic and applied settings. The program emphasizes the theoretical foundations of psychology as well as supervised experience oriented toward the development of practical skills. The program embodies a model of clinical psychology in which practice and research are integrated. Clinical program students must complete a predissertation research project by the end of the second year.

After forming the doctoral committee, students must then pass a comprehensive examination administered and evaluated by the committee. This examination is comprised of two parts, one addressing a topic of the student's choice, and the second addressing an understanding of one individual's personality and cognitive functions. All doctoral students must complete a minimum of 78 hours of graduate level courses, including coursework required by their program; at least 6 hours in courses outside of psychology; and at least 24 hours of dissertation research (Psychology 600). Finally, students must complete an acceptable doctoral dissertation and conduct a satisfactory oral defense of the dissertation. Requirements are as follows.

**GRADUATE COURSES**

400 Cognitive Psychology: Language and Symbolic Processes of Psychology of knowing, explaining, and understanding. Directed and associative thinking, memory, problem-solving, and concept formation. Natural uses, and development of language. Prereq: General Psychology or consent of instructor.

499 Group Facilitation (3) Study of theory and technique through supervised experience in small groups. Prereq: General Psychology or consent of instructor. May be repeated. Maximum 6 hrs.

410 Sensory Processes & Perception (3) Survey of physiological and psychological theories of perception, audition and vision. Prereq: General Psychology or consent of instructor. Prereq: Statistics in Psychology or Statistical Reasoning or Introduction to Statistics or graduate standing.

415 Psychology of Religion (3) History of psychology of religion: various philosophical and empirical orientations. Psychological function of religion for individuals and society. Prereq: General Psychology or consent of instructor.

420 History and Systems of Psychology (3) History of psychological thought. Classical approaches and recent developments. Prereq: General Psychology or consent of instructor.

424 Psychology and the Law (3) Psychological aspects of legal systems. Prereq: General Psychology or consent of instructor.

430 Health Psychology (3) Survey of psychological factors related to health and illness: stress, personality, and environment. Applications of psychological treatments to physical illness. Prereq: General Psychology or consent of instructor.

434 Psychology of Gender (3) Biological, psychological, and social factors in gender: importance of gender roles and stereotypes for behavior and experience. Prereq: General Psychology or consent of instructor.

440 Organizational Psychology (3) Social-psychological analysis of organizations, role-theory and systems theory. Prereq: General Psychology and Social Psychology or consent of instructor.


450 Comparative Animal Behavior (3) (Same as Ecology and Evolutionary Biology 450.)

459 Comparative Animal Behavior Laboratory (3) Coreq: 450. (Same as Ecology and Evolutionary Biology 459.)

461 Physiological Psychology (3) Nervous system and psychological correlates of behavior. Biological basis of emotion, learning, memory, and stress. Prereq: General Psychology or consent of instructor and either Biodiversity and Organization or Function of the Cell, or Human Origins and Principles of Biological Anthropology.

470 Theories of Personality (3) Survey of major theories of personality and their development. Prereq: General Psychology or consent of instructor.

475 Adolescent Development (3) Theoretical perspectives and empirical research findings pertinent to adolescent development. Prereq: General Psychology or consent of instructor.

480 Theories of Learning (3) Classical and current approaches to learning and cognition. Prereq: General Psychology or consent of instructor.

482 Topics in Psychology (3) Intensive analysis of special topics: Afro-American psychology or evaluation of programs in community. Prereq: General Psychology or consent of instructor. May be repeated. Maximum 6 hrs.

488 Supervised Research (1-99) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs in 489, 491, 492, and 493 combined may apply toward undergraduate major.

500 Thesis (1-15) Pr/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E
532 Topics in the History of Religions (3) Prereq: Consent of instructor.

533 Topics in Religious Thought (3) Prereq: Consent of instructor.

591 Foreign Study (1-15) See College of Arts and Sciences.

592 Off-Campus Study (1-15) See College of Arts and Sciences.

593 Independent Study (1-15) See College of Arts and Sciences.

### Russian

See Modern Foreign Languages and Literatures

### Small Animal Clinical Sciences

See College of Veterinary Medicine and Comparative and Experimental Medicine

### Social Work

#### Graduate Courses

405 Modern Jewish Thought (3) History, culture, and geography of the new Israeli portion of Levant from 1850 to present. Founding of modern state of Israel in 1948 and political complexities of Middle East. Israeli culture and literature. Writing emphasis course. (Same as Judaic Studies 405.)

411 Modern Religious Philosophies (3) Religious implications of major Western thinkers and movements from Nietzsche to twentieth-century German Idealists. (Same as Philosophy 411.)

412 Classical Indian Systems of Philosophy: The Moksha Tradition (3) Investigation of selected writings and problems in religious, philosophical, and metaphysical traditions of Samkhya, Yoga, Vedanta, Buddhism, or Jainism. Prereq: 374 or 376 or consent of instructor.

425 Seminar in Western Religions (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

430 Seminar in American Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

440 Seminar in Comparative Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

490 Readings and Research in Religious Studies (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.


506 Historical and Comparative Studies of Religions (3) Description and analysis of religious traditions, phenomena, and themes. May be repeated. Maximum 6 hrs.

507 Religion, Power and Society (3) Studies of religions in relation to social structure and political institutions: issues of gender, race, class, and ethnicity, caste, slavery, religion and the state, globalization and human rights. May be repeated. Maximum 6 hrs.

513 Religion, the Arts, and the Media (3) Material and expressive culture, religion and literature, mass communication technologies, popular culture, issues of representation, cultural studies methodologies. May be repeated. Maximum 6 hrs.

514 Religion and Healing (3) Ecology of religion, nature, shamanism, healing of body and mind, spirituality, religious dimensions of medical ethics. May be repeated. Maximum 6 hrs.


520 Readings in the Study of Religion (1-6) May be repeated. Maximum 12 hrs.

522 Topics in the History of Religions (3) Prereq: Consent of instructor.

GRADUATE COURSES

405 Modern Jewish Thought (3) History, culture, and geography of the new Israeli portion of Levant from 1850 to present. Founding of modern state of Israel in 1948 and political complexities of Middle East. Israeli culture and literature. Writing emphasis course. (Same as Judaic Studies 405.)

411 Modern Religious Philosophies (3) Religious implications of major Western thinkers and movements from Nietzsche to twentieth-century German Idealists. (Same as Philosophy 411.)

412 Classical Indian Systems of Philosophy: The Moksha Tradition (3) Investigation of selected writings and problems in religious, philosophical, and metaphysical traditions of Samkhya, Yoga, Vedanta, Buddhism, or Jainism. Prereq: 374 or 376 or consent of instructor.

425 Seminar in Western Religions (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

430 Seminar in American Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

440 Seminar in Comparative Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

490 Readings and Research in Religious Studies (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.


506 Historical and Comparative Studies of Religions (3) Description and analysis of religious traditions, phenomena, and themes. May be repeated. Maximum 6 hrs.

507 Religion, Power and Society (3) Studies of religions in relation to social structure and political institutions: issues of gender, race, class, and ethnicity, caste, slavery, religion and the state, globalization and human rights. May be repeated. Maximum 6 hrs.

513 Religion, the Arts, and the Media (3) Material and expressive culture, religion and literature, mass communication technologies, popular culture, issues of representation, cultural studies methodologies. May be repeated. Maximum 6 hrs.

514 Religion and Healing (3) Ecology of religion, nature, shamanism, healing of body and mind, spirituality, religious dimensions of medical ethics. May be repeated. Maximum 6 hrs.


520 Readings in the Study of Religion (1-6) May be repeated. Maximum 12 hrs.

522 Topics in the History of Religions (3) Prereq: Consent of instructor.
Advanced Standing

The University of Tennessee College of Social Work has an advanced standing program. Admission to advanced standing requires: (1) a B.S.W. from an accredited program, (2) an overall undergraduate GPA of 3.0 or greater, and (3) personal qualifications acceptable for entrance into the professional practice of social work. Students admitted into advanced standing are required to complete a minimum of 36 hours of study in either of the college's concentrations - clinical social work practice or social work management and community practice. These students will follow the curriculum plan and meet all requirements of the concentration during three semesters of study in the program.

Specific information about the advanced standing program is available from the college. Application for admission to the advanced standing program is through the regular admission process.

Extended Study

PLanned part-time programs are available in all three locations of the college. Admission requirements are the same as for full-time study. Coursework can be completed over a three-year period.

Financial Aid

Students may apply directly to the University's Financial Aid Office for assistance such as the National Direct Student Loan or the Work-Study Program. Information regarding scholarships administered by the College is made available after admission.

General Requirements

1. The program requires successful completion of a minimum total of 60 semester hours including completion of the foundation curriculum (30 hours) and 200 hours in one of the two concentrations (clinical social work practice or social welfare management and community practice).

2. Students may select a thesis or nonthesis option. Students pursuing the thesis option receive six credit hours for successful completion.

3. Successful completion of a comprehensive exam or thesis defense.

4. An overall GPA of 3.0 or better on all graded courses and satisfactory performance in field.

The Professional Foundation Curriculum

All students must complete 30 semester hours in the foundation curriculum consisting of 24 hours in foundation classroom courses and 6 hours in field practice. The foundation is the initial phase of the master's program and contributes to the process of professional identification. The faculty provides a comprehensive, broad base of theory, knowledge, and skills from which to practice. The foundation classroom courses include: Foundations of Social Work Practice I, II and III; Human Behavior in the Social Environment I and II; Social Welfare Policy and Services; Social Work Research; and Social Work and Oppression. Students also complete a two-semester field placement, Field Practice (6 hours). Upon successful completion of the foundation curriculum, all students must complete a minimum of 30 hours in the concentration curriculum including field practice (12 hours). Students select a concentration in clinical social work practice or social welfare management and community practice.

Clinical Social Work Practice: The clinical social work practice concentration focuses on students developing expertise in clinical social work practice with client systems including individuals and small groups, particularly with clients from high-risk and vulnerable populations. The concentration emphasizes theoretical and empirical knowledge and practice skills in differential assessment, clinical interventions and practice evaluation. The concentration also emphasizes knowledge and skills directed toward (1) an elaboration of complex psycho-social, interpersonal problems; (2) ethically sound and culturally sensitive practice; and (3) influencing the development of services and programs that are responsive to the needs of vulnerable, high-risk clients and groups.

Required courses:
521 Clinical Social Work Practice with Individuals (3 hours)
525 Clinical Social Work Practice with Groups (3 hours)
526 Evaluating Clinical Practice (3 hours)
582-83 Field Practice (12 hours)
Minimum of three (total of 9 hours) advanced course electives as follows:
One or more from a pool of advanced clinical practice courses.
One or more from a pool of advanced general courses.

Social Welfare Management and Community Practice: The social welfare management and community practice concentration focuses on students developing skills directed toward the management and analysis of complex service delivery needs within organizations and communities; knowledge and skills in the development of service intervention strategies to address such related needs; and the organizational and management skills that enable practitioners to work in a variety of challenging and turbulent environments. The concentration emphasizes theory and skills related to leadership and administration, and permits flexibility in tailoring a program to fit the student's individual interests, capabilities, and career goals.

Required courses:
541 Leadership and Management in Human Services (3 hours)
543 Financial Management and Resource Development (3 hours)
547 Evaluation Research (3 hours)
582-83 Field Practice (12 hours)
Minimum of three (total of 9 hours) advanced course electives as follows:
One course in advanced policy (3 hours)
Two courses from a pool of advanced general courses (6 hours).

Field Practice

Field instruction is a critical component of the student's first- and second-year programs. Through cooperation with a wide range of social agencies and human service programs throughout Tennessee, the college is able to provide field placements in a variety of social work practice areas. The faculty works closely with the placement agencies and the field instructors to insure that students have quality field practice experiences, meeting the objectives of the core curriculum and the concentration.

The college uses a concurrent class and field plan. Students are in field two days per week during the first year and three days per week in the second year.

First-year agency placements are selected to provide practice experiences related to the foundation curriculum content. Within the placement, each student's experiences are planned and designed according to educational objectives.

Second-year placements are selected according to the student's area of concentration, individual career interests, and educational needs. The student actively participates with the field practice coordinator and the educational committee in selection of the second-year placement. The second-year field placement experiences focus on the integration of social work knowledge and values, and emphasizes the acquisition and development of practice skills.

Students are responsible for meeting the requirements of their placement agencies in terms of office hours and workload coverage. This responsibility takes precedence over scheduled University breaks and may result in variations in holidays and office hours for the student.

Students receiving a grade of NC in field practice may not repeat the field practice.

Transfer Credits

Coursework equivalent to the first year of the master's program, completed in another accredited graduate social work program, is usually accepted toward degree requirements. Applicants must meet the admission requirements of The Graduate School and the College of Social Work. Transfer courses must be approved as equivalent to required courses by The Graduate School and the College of Social Work.

Transfer coursework must be completed within the six-year period prior to the receipt of the degree. A maximum of 6 semester credits from work earned in disciplines other than social work may be transferred as elective credits. The student's academic committee must approve the request and the transfer credit must meet Graduate School requirements.

Proficiency Examination

Students in the master's program may earn a maximum of nine hours by proficiency examination, with the exception of field practice courses. Students interested in proficiency examinations are referred to The Graduate School statement describing the procedure for applying for examination.

THE DOCTORAL PROGRAM

The College of Social Work offers the Doctor of Philosophy with a major in Social Work.

The focus of social work education at the doctoral level is to foster the development of an attitude of scientific inquiry, knowledge of the scientific method, ability to extend the
knowledge base of social work practice, and effective participation in leadership roles in social work education, research, and practice.

The emphasis of the doctoral program is upon:
- The analysis of direct intervention and social administration and of the interrelationships among each of them and their social policy, organizational, and community contexts.
- Research-based knowledge to inform and guide social work practice, social policy, and social welfare program development.

The program consists of foundation courses, elective courses, and dissertation research. The courses are available only in Knoxville. Students and their committees can develop a plan for completing their research in Nashville and Memphis based on the availability of dissertation resources.

Students have the opportunity to work in the Children's Mental Health Services Research Center as part of their training. The Center focuses on services to children who have experienced mental health problems associated with abuse, neglect, violence, and a variety of psychosocial problems.

Admission Requirements
The Ph.D. program is designed for students who have completed a master's degree in an accredited school of social work and have post-master's social work/social welfare experience. Applicants who do not meet these requirements, but believe they have equivalent credentials should contact the Chair of Ph.D. program for further information regarding admissions criteria.

General Requirements
1. A minimum of 66 hours beyond the master's degree including:
   a) completion of 27 hours of required coursework, b) completion of 15 credits of advanced electives, at least 12 of which are taken outside the department, and 9 of those 12 related to the dissertation, and c) completion of at least 24 credit hours of dissertation research.
2. Successful completion of qualifying and comprehensive examinations.
3. Completion and defense of the dissertation.

Curriculum
The curriculum of the Ph.D. program consists of foundation coursework, electives, and dissertation research. The foundation curriculum consists of 27 hours of coursework in the history and philosophy of social work, issues in direct service and administration and planning, areas of practice, and research methodology and statistics. Upon this foundation, students and their academic committees develop a plan of study consisting of coursework in Social Work and other departments of the University.

Typically, the 24 hours of foundation coursework are completed and elective coursework begun during the first year of study. Social Work 670 and the elective requirement are completed and dissertation research begun in the second year of study, and dissertation research is continued in the third year of study. While it is generally expected that the coursework will be completed on a full-time basis, dissertation research can be completed on a planned part-time basis.

Specific courses required are 601, 602, 612, 613, 640, 650, 670, and Statistics 531 and 532 or any two graduate level statistics courses approved by the Doctoral Program Chair.

Examinations
All doctoral students are required to pass a qualifying examination and a comprehensive examination. The qualifying examination covers the foundation curriculum. The comprehensive examination is administered by members of the doctoral committee and is designed for the student to demonstrate comprehensive knowledge of the major and cognate areas and the dissertation topic. In case of failure of either examination, the student may request a retake. The result of the second examination is final.

Financial Aid
Financial aid is available to qualified students in the form of fellowships, scholarships, and teaching and research assistantships. Graduate assistantships and other forms of assistance are awarded on the basis of merit and interest to applicants who are accepted into the Ph.D. program.

MINOR IN GERONTOLOGY
Graduate students in the College of Social Work, at the Knoxville location, may pursue a specialized minor in gerontology. This interdepartmental/interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

POST-MASTER'S CERTIFICATE IN MANAGEMENT AND COMMUNITY PRACTICE
The College of Social Work offers a 15-credit hour post-master's certificate program designed for social workers desiring supervisory, management, administration and community practice training and education to enhance career advancement or career redirection. Required for admission is a master's degree in social work or closely related field.

Course requirements are 541, 543, 547, and two courses selected from 550, 551, 552, 555.  

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.S.S.W. and Ph.D. programs in Social Work are available to residents of the state of Arkansas. The Ph.D. to residents of Delaware, Oklahoma or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

NOTE: Graduate students majoring in fields other than social work are admitted to certain social work courses with the approval of the College of Social Work and the student's major professor.

500 Thesis (1-15) P/NP only. E

501 Foundations of Social Work Practice I (3) Survey of history, mission, and identity of profession. Basic theory, professional values and ethics, and methods generic to social work practice at various systems levels. Assessment, planning, communication, intervention, and evaluation skills.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

503 Foundations of Social Work Practice II (3) Generalist practice with family and small group systems. Ecological theory to frame understanding of such systems and their adaptation to environments. Various social work roles and intervention strategies pertaining to client systems.

504 Foundations of Social Work Practice III (3) Basic theory, methods, problems, and strategies in implementing planned change within and among larger social systems; task groups, human service organizations, and community systems. Various practice roles: planner, program developer, supervisor, administrator, advocate and task group leader.

506 Social Work Research (3) Research methodologies with respect to evolution and application to social work theory and practice. History and philosophy of science; problem formulation; research design; ethics; instrument use and construction; data collection; analysis and reporting; and evaluation and utilization of results.

508 Practicum in Social Work Research (3-6) Supervised practice in application of research methods to social work. May be repeated. Maximum 6 hrs. S/NC only.

509 Graduate Seminar in Public Health (1) Same as Public Health 509, Exercise Science 509, Nutrition 509, and Nursing 509.

514-15 Human Behavior in the Social Environment I, II (3,3) Major social science theories that inform social work profession's understanding of human behavior and social systems from ecological perspective and the time, interactions among biological, social, psychological, and cultural systems on development across life cycle. Effects of ethnic, racial, and cultural variables. Sexual orientation, gender, and sexual orientation variables. 514—Life cycle from infancy through adolescence. 515—From young adulthood through senior adulthood.

516 Social Welfare Policy and Services (3) Development of contemporary social policy at local, state, national, and international levels. Contribution of social work professionals to formal policy-making process through which microsocial change is effected and through which aggregate social welfare services are proposed, authorized, financed, and programmed. Theories of complex organizations applied to social welfare service delivery settings.

518 Social Work and Oppression (3) Sources, dynamics, and impact of oppression in U.S. society as manifested in both social/educational/ economic systems and personal experience. Concepts among various forms of oppression: racism, sexism, classism, and heterosexism, and forces that perpetuate such conditions.

521 Clinical Social Work Practice with Individuals (3) Theories, knowledge, and skills for clinical practice with individuals from ecological perspective. Therapeutic process and intervention strategies, incorporating concept from psychodynamic and cognitive practice models, and specific client problems.

523 Clinical Social Work Practice with Families (3) Concepts related to understanding and analyzing family dynamics and interactional patterns from perspective of major family therapy models. Techniques of intervention in terms of application to families with varied system and individual problems and to families from varied social and cultural backgrounds.

525 Clinical Social Work Practice with Groups (3) Theoretical and historical approaches to social work.
505, or 560. Sociology 534, 622, and Statistics 532 are recommended. Sociology courses at the 400 level may be taken with the approval of the student's committee. A student's plan of study should follow one of the following approaches: Plan 1, 6 hours in one of the department's concentrations and 6 hours in a second area, including areas outside the department, subject to the approval of the student's committee; Plan 2, 12 hours in a special area of study approved by the student's committee and the Graduate Program Committee. Students are encouraged to prepare a program synthesizing their knowledge of the concentration(s). Students who incorporate supervised field experience in their programs are encouraged to prepare a report based on those experiences that demonstrates their understanding of research, theory, and report writing. All students must take final written and oral examinations that include questions on their general coursework in theory and methods and on their special areas of study. Subject to approval by the student's committee, up to 12 hours may be taken in courses outside the department for either program.

THE DOCTORAL PROGRAM

Coursework
Twenty-four hours of coursework beyond the master's degree are required (exclusive of S/N/C credits). Twelve hours of course credit in Sociology at the 600 level are required. Students who enter the program without the courses required for the M.A. degree (521, 531, Statistics 531) or their equivalents must take them as remedial work which does not apply to their residence. Students must complete Sociology 622, 534, 563, 633, or 636; and Statistics 532 or another advanced course in statistics. Completion of 9 hours in each of two concentrations is encouraged. A student who cannot achieve his/her educational goals within the department's concentrations may construct an individualized course of study subject to the approval of the student's doctoral committee and the Graduate Program Committee. Sociology courses at the 400 level may not be taken without the consent of the student's advisor and the Graduate Program Committee. Six hours may be taken in related fields without petitioning the Graduate Program Committee for approval. The student's program may include a minor or cognate field.

Comprehensive Examinations
Written examinations in four areas are required (sociological theory, research methodology, and two substantive areas). Doctoral students are eligible to take the theory and methodology examinations whenever offered. Substantive examinations may be taken upon completion of theory and methodology examinations. Detailed information on examinations and examination options (generalist, specialist, and collateralist) may be obtained from the department.

Dissertation and Final Examination
A dissertation based on original research must be completed (24 hours). The candidate must pass an oral defense of the dissertation, including the theory and methodology related to the research, in accordance with the deadlines specified by The Graduate School.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

MINOR IN GERONTOLOGY

Graduate students in the Department of Sociology may pursue a specialized minor in gerontology. This interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The M.A. program in Sociology is available to residents of the state of Virginia (concentration in criminology only), the Ph.D. to residents of Florida (concentration in criminology only), or West Virginia. Additional information may be obtained from the Admission Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

405 Sociology of Sport (3) Social meaning, organization, and process of sport. Prereq: 291 or consent of instructor.
414 Sociology of Health Care (3) Organization of health care facilities, staff-patient relationships, demographic characteristics, and prevalence of disease.
415 Sociology of Aging (3) How roles and statuses change with age in relation to major social institutions; impact that rapidly increasing number of older people has on society, effect of society on older people.
446 The Modern World System (3) Critical examination of capitalist world-system as social system, its coherence, boundaries, regions, member groups, cleavages, and patterns of conflict. Analysis of who gets what, why, and how in global political economy.
455 Society and Law (3) How laws and legal processes are affected by social change, social impact of legal sanctions, relations between law and social justice.
459 Organizational and Corporate Crime (3) Analysis of crime and deviance committed by organizations. Case studies of corporate and organizational crime, organizational dynamics of crime, theories of corporate crime, and organized responses to this type of crime by governmental regulatory agencies.
462 Population (3) Demographic factors and social structure; trends in fertility, mortality, population growth, migration, distribution, and composition; population policy.
464 Urban Ecology (3) Relation of humans to their urban environment: conservation and use of appropriate technology. (Same as Urban Studies 464.)
465 Social Values and the Environment (3) Human dimensions of ecosystem management and public policy. Applied focus on social values activated within specific biophysical and social settings. Prereq: 110 Social Problems and Social Change or 120 General Sociology or consent of instructor.
471 Sociolinguistics (3) (Same as English 471 and Linguistics 471.)
480 Diffusion of Agricultural Technology (3) (Same as Rural Sociology 480.)
500 Thesis (1-15) P/NP only; E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. Maximum 6 hrs.
504 Sociological Foundations of Political Economy (3) Survey of contemporary sociological theories of political economy, sources of political and economic power and conflict.
505 Foundations of Criminology (3) Critical overview of contemporary developments in criminology, theories of crime causation and theories of responses to crime. Prereq: 350 or equivalent.
507 Foundations of Social Psychology (3) Current and classical theoretical perspectives in social psychology.
510 Teaching Sociology (3) Art and craft of teaching sociology from curricular considerations through teaching techniques. May be repeated. Maximum 6 hrs.
521 Sociological Theory I (3) Assessment of what sociological theory is; its major figures and their approaches to understanding society.
531 Research Methods in Sociology (3) Research design, measurement, sampling, qualitative and quantitative data collection techniques, data, reduction, and analysis.
534 Advanced Sociological Analysis (3) Underlying assumptions and logical procedures used by sociologists in formulating explanations; foundations of sociological research strategies and techniques.
540 Occupations (3) Occupations in relation to individuals and society, economic stratification, and social organizations.
541 Collective Behavior, Social Movements, Social Change (3) Basic theory and research on conditions of social unrest in human collectivities and efforts of collectives to change existing society.
543 Sociology of Development (3) Sociological theories and studies of development: modernization, colonialism, dependency; comparative impact of various development paths upon selected aspects of social structure and change.
551 Delinquency and the Social Structure (3) How study of delinquency and juvenile justice is affected by changing statuses of childhood and adolescence, changing demographic and institutional influences, and changing views about responsibility and punishment.
560 Environmental Sociology (3) Systematic treatment of current research in environmental sociology. Social impact analysis and conflicts over environmental issues.
563 Demographic Techniques (3) Standard rates and measures of demographic variables, life table analysis, increment-decrement models, and survey techniques of population analysis.
580 Advanced Rural Sociology (3) (Same as Rural Sociology 580.)
585 Seminar in Gerontology (1) (Same as Human Ecology 585, Consumer Education, and Counseling Psychology 585, Exercise Science 585, Nutrition 585, Public Health Science 585, Psychosocial Studies 585, and Sociology 685.)
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.
Special Programs

GRADUATE COURSES

510 Humanities Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in humanities. Emphasis on nature and special forms of human experience and its interpretation through study of formal texts and critical figures.

520 Natural Science Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in physical and biological sciences drawing on history of science, critical figures in shaping of scientific thought, and methodology for observation and experimentation in natural sciences.

530 Social Science Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in social sciences. Emphasis on methodology for observation and research in study of human beings, their social environments and their behavior.

Speech Communication

(College of Communications)

MAJORS

Communications ......................... M.S., Ph.D.

Professors:

John W. Haas, Head

D.K. Grant, Charles H., Ph.D.

Yeomans, G., Allan (Emeritus).

Ph.D. Louisiana State

Associate Professors:

Ambrester, M., L., Ph.D ...................... Ohio

Cook, N. C., Ph.D. ......................... North Carolina

Glenn, Robert W., Ph.D. ................... North Carolina

Haas, John W., Ph.D. ..................... Pennsylvania

Assistant Professors:

Ambler, R. S., Ph.D. ....................... Ohio State

Grant, Charles H., Ph.D. .................. South Florida

Violanti, Michelle T., Ph.D. ............... Kansas

The Department of Speech Communication offers a concentration area for the master’s degree with a major in Communications and participates in the interdisciplinary doctoral program. See Communications for additional information.

Graduate courses in Speech Communication also provide opportunities for students in a variety of disciplines to investigate how oral language can effect changes in the knowledge, the understanding, the ideas, the attitudes, or the behavior of other human beings.

GRADUATE COURSES

420 Communication and Conflict (3) Communication as significant factor in development, management, and resolution of conflict at interpersonal, small group, organizational or societal levels.

425 Interpersonal Health Communication (3) Interpersonal communication in health care settings: provider-client interactions, social support groups, stigma and disease, and contemporary models explaining use of health-related information.

440 Organizational Communication (3) Organizational setting and variables of communication process that affect quality of human interaction both within and outside organization.

466 Rhetoric of the Woman’s Rights Movement to 1930 (3) Historical and critical study of public address in campaign for women’s rights in United States from 1830’s through 1920’s. (Same as Women’s Studies 466.)

476 Rhetoric of the Contemporary Feminist Movement (3) Historical and critical study of rhetoric in campaign for women’s rights in United States from 1940’s to present. (Same as Women’s Studies 476.)

505 Research Methods (3) Understanding of wide array of data collection and analysis procedures used in research communication research. Development of project/thesis proposal.

510 Orientation to Teaching Assistantship (1) Curriculum, classroom management, and other issues associated with teaching at college level. For departmental GTAs.

526 Seminar in Interpersonal Health Communication (3) Seminar research in health communication: support groups, medical ethics, medical narratives, doctor-patient communication, or interpersonal communication theoretical perspectives in medicine.

550 Organizational Culture (3) Clarification of complex nature of organizational culture to communicate meaning and its usefulness to organizational effectiveness: challenges created by today’s changing organizations and workforces.

560 Special Topics in Speech Communication (3) Contemporary topics. Prerequisites: May be repeated. Maximum 6 hrs.

580 Contemporary Rhetorical Theory (3) Current theoretical contributions to rhetoric: Burke, Perelman, Weaver, feminist and critical scholars.

590 Directed Reading and Research (3) May be repeated. Maximum 6 hrs.

591 Foreign Study (1-15) Independent study outside U.S. Prior to departure student must have plan of study approved by department head and supervising faculty member. Credit given only upon fulfilling all requirements set by department. May be repeated. Maximum 15 hrs.

592 Off-Campus Study/Internship (1-6) Independent study outside traditional classroom setting: community involvement and/or work experience; Credit given only upon fulfilling all requirements set by department. May be repeated. Maximum 6 hrs.

593 Independent Study (1-6) Independent study under direction of faculty member. Must obtain approval of faculty member and department prior to study.

Statistics

(College of Business Administration and Intercollegiate Program)

MAJORS

Statistics ......................... M.S., Ph.D.

Business Administration ........... MBA, Ph.D.

Robert W. Mee, Head

Professors:

Bozdogan, Hamparsum, Ph.D. ............. Illinois

Guess, Frank M., Ph.D. ............. Florida State

McLean, Robert A. (Emeritus), Ph.D. ....... Purdue

Mee, Robert W. Ph.D. ....................... Iowa State

Perr, William C., Ph.D. ..................... Southern Methodist

Phlipot, John W. (Emeritus), Ph.D. ........ VPI

Sanders, Richard D. (Emeritus), Ph.D. ....... Texas

Sylvester, David L., Ph.D. .................... Stanford

Thigpen, Charles C. (Emeritus), Ph.D. ....... VPI

Associate Professors:

Lehnaker, Mary G., Ph.D. ............. Kentucky

Leon, Ramon V., Ph.D. ............. Florida State

Walker, Esteban, Ph.D. .................... VPI

Younger, M. S. (Liaison), Ph.D. ............ VPI

Spanish

See Modern Foreign Languages and Literatures

Special Programs

(College of Arts and Sciences)

GRADUATE COURSES

510 Humanities Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in humanities. Emphasis on nature and special forms of human
THE MASTER'S PROGRAM

The M.S. program in Statistics provides students with the foundations in theory and practice required for careers in applied statistics. In addition to the education traditionally offered in such a program, the department offers a concentration in industrial statistics, which provides unique opportunities for experiences in practical applications of statistics. Through involvement in The University of Tennessee Practical Strategies for Process Improvement Institute and related programs, department faculty participate in a variety of consulting and research projects in industry. Students may supplement their classroom study with an industrial internship and participation in research projects dealing with industrial problems. Department faculty also collaborate with researchers from many academic disciplines. Statistics graduate students may gain consulting experience by working with faculty involved in these consulting activities. All students are encouraged to participate in supervised internship or consulting activities as part of their graduate program.

Individuals with undergraduate or graduate degrees in other disciplines are encouraged to enter the program. The candidate's mathematics background should include differential and integral calculus of several variables. Individuals with limited mathematics background should seek departmental guidance regarding specific ways in which they may prepare themselves for the program by taking coursework as non-degree students. Requests for application forms and further information may be sent to the Director of Graduate Studies, Department of Statistics, Stokely Management Center, University of Tennessee, Knoxville, TN 37996-0532 or ewalker@utk.edu or http://www.pemsba.utk.edu/igsp.

Admission Requirements

General admission requirements for The Graduate School are stated beginning on page 12. Applicants for Statistics must submit results of the Graduate Record Examination (GRE) general portion, although GMAT exam scores may be substituted. Applicants for the statistics program must have completed at least two years of college-level mathematics, including the calculus of several variables and matrix algebra, and be proficient in a computer language. Applicants whose native language is other than English must submit results of the Test of English as a Foreign Language (TOEFL).

Curriculum

A minimum of 33 credit hours must be completed for the master's degree. Required of all students are 6 hours in statistical methods, 6 hours in statistical theory, and 1 hour in statistical computing. Students must complete a minimum of 21 hours in approved statistics courses, exclusive of consulting, internship, independent study, or thesis.

Thesis or Independent Study

The thesis option for the master's degree requires the student to complete 6 hours for the thesis. Alternatively, the non-thesis option requires a minimum of 3 hours for an independent study project.

Comprehensive Examination

Students must pass a two-part written comprehensive examination covering 1) theory and 2) methods. Upon failing either part of the examination, the student may retake it. The result of the second examination is final. For students writing a thesis, this examination must be passed before the thesis is defended.

INTERCOLLEGIATE GRADUATE STATISTICS PROGRAM

The Intercollegiate Graduate Statistics Program (IGSP) is a formal University of Tennessee academic program established to enable students to earn either a minor or an M.S. in Statistics simultaneously with a master's or doctoral degree in another department. Approved coursework taken to meet doctoral requirements in the student's home department may also be credited toward the M.S. in Statistics. Similarly, approved coursework in statistics taken to meet the requirements for a master's or doctoral degree in another department may also count toward the minor in Statistics. The program is open to graduate students in all departments which have an approved minor and/or M.S. joint major curriculum offered through the program. The Graduate Record Exam is administered by an Executive Committee, consisting of college representatives from all colleges with approved programs, with advisory input from the program faculty.

Degree Program

Doctorate in home department. M.S. in Statistics

The M.S. in Statistics requires 33 hours.

Course options consist of courses in statistics, offered either by the Department of Statistics or by other departments, which have been reviewed and approved by the IGSP Executive Committee. Students taking an M.S. in Statistics must pass the two-part comprehensive examination covering statistical theory and methods. Students taking a minor in Statistics in conjunction with a doctorate in another field must pass a written comprehensive examination in Statistics, constructed and evaluated by the student's Examining Committee. No formal comprehensive examination is required of students earning a Statistics minor along with a master's in another field beyond questions which the home department wishes to include as part of the comprehensive examination for the master's degree.

General Admissions and Degree Requirements

1. The student's home department must have approved a program of courses with the Executive Committee. That program will specify the sequence of statistics courses, chosen from the IGSP approved list, that are considered appropriate by the home department. Students who wish to participate in this program should contact their college representative or the Chair of IGSP in the Department of Statistics.

2. The student's graduate committee must include a member of the IGSP faculty. For students seeking doctoral degrees or the M.S. in Statistics, the committee member must be a faculty member in the Statistics Department.

3. The student's Admission to Candidacy form must contain all courses required for the chosen degree program set off in a group and labeled "Statistics Courses Required for the Minor or M.S. in Statistics." Should the student not decide to apply for admission to the program until after completion of some of the courses, the student's major professor should file a program change with the cooperating departments and assist the student in obtaining a Department of Statistics faculty member to serve on the student's graduate committee.

Successful completion of the Statistics M.S. or minor is recognized by appropriate documentation on the student's transcript. Students who do not complete the requirements of the minor or M.S. will still receive academic credit for the statistics courses they have successfully completed.

BUSINESS ADMINISTRATION CONCENTRATION

For complete listing of MBA program requirements, see Business Administration.

MBA Concentration: Statistics

Minimum course requirements are 571, 566, 572 with a grade of C or better, and 561.

Ph.D. Concentration: Statistics

This degree provides students with a broad knowledge of the field of statistics, the ability to apply statistics in practical situations to problems of business and industry and the ability to develop new statistical methods; all of which takes place while students are
exposed to coursework in the basic functional areas of business. Minimum course requirements are: 673, 666, 691, and 592.

**CERTIFICATE IN APPLIED STATISTICAL STRATEGIES**

The Department of Statistics offers a certificate program in applied statistical strategies. The program is designed for the part-time student, and several of the course are offered through distance education.

The 12-credit certificate is available by completing two required courses, 571-72, and two electives selected from the following: 573, 575, 579, and 585 or 566 or other graduate statistics courses as approved by the Statistics Graduate Program Committee.

**ACADEMIC STANDARDS**

A graduate student in the College of Business Administration whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative graduate grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next semester's coursework as established by the degree program for full-time students and the next two semesters' coursework as established by the degree program for part-time students.

**GRADUATE COURSES**


500 Thesis (1-15) S/N only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E


531 Survey of Statistical Methods (3) Univariate and bivariate data collection and organization; statistical estimation and hypothesis testing; analysis of real data; categorical and numerical data, including Chi-square tests and simple linear and quadratic regression. Use of computerized techniques. Prereq: 531 and 537. Prereq: 1 yr. college mathematics. F

532 Survey of Statistical Methods II (3) Multiple linear regression, including use of dummy variables; single and multiple factor analysis of variance and covariance; issues in experimental design and analysis. Use of computing facilities required. Prereq: 531. Sp

537 Statistics for Research I (3) Principles and application of statistical methodology, integrated with considerable use of modern statistical computing systems. Probability and probability distributions, forming and testing hypotheses using parametric and nonparametric inference methods; Maximum likelihood estimation, simple linear regression and correlation. Credit not given for both 531 and 537. Prereq: 1 yr undergraduate mathematics and 1 undergraduate statistics course. F

538 Statistics for Research II (3) General linear model as applied to multiple regression and analysis of variance, Diagnostic and influence techniques. One-way, factorial, blocked, and nested designs, planned versus post hoc analyses. Random factors and repeated measures. Prereq: 537 or 532. Sp

561 Introduction to Computing for Data Management and Analysis (1) UT computing environment for beginning statistics graduate students. Use of operating system commands, system editor, utility programs; and SASS statistical package for data entry and editing, file management and statistical analysis. Use of UTCC computing facilities required. Coreq: 531, 537 or 571, or consent of instructor. F

563 Introduction to Mathematical Statistics (3) Basic probability models and theory of distributions of random variables. Prereq: Mathematics 241. F

564 Theory of Statistical Inference (3) Theory underlying common statistical procedures of hypothesis testing and confidence intervals. Prereq: 563. Sp

565 Statistical Techniques in Industrial Processes (3) Applications of control charts and other statistical techniques in industrial setting. Attributes and variable control charts, process capability analysis, aspects of sampling, sampling planing, tolerancing, estimation of variance components, problems of measurement, special industrial applications. Prereq: 571 or equivalent. F


577 Design of Experiments (3) One-way ANOVA, multiple range tests, equal and unequal variances, transformations; factorial experiments, completely randomized designs, analysis of covariance, split-plot and nested designs, fractional factorial designs; sequential designs. Prereq: 571. Sp

578 Applied Time Series (3) Fundamentals of time series analysis: Box-Jenkins approach; stationary and nonstationary models, forecasting model identification, seasonal models, transfer function models, and spectral theory. Prereq: 538 or 572 or consent of instructor. Sp


583 Special Topics in Applied Statistics (1-3) May be repeated. Maximum 6 hrs.

585 Principles of Statistical Process Management (1-3) Statistical and other techniques applied to management of organizational processes. Prereq: Consent of department head.

587 Graduate Seminar (1) Directed readings and active participation in colloquium program of Department of Statistics and of student's minor program. Prereq: Consent of department director of graduate studies. May be repeated. Maximum 2 hrs. S/N/C only.

592 Internship (1-6) Supervised off-campus experience in application of statistical principles and methods in business, industry, or government. Written and oral report. Prereq: Graduates courses in graduate-level statistics or consent of statistics department director of graduate studies. May be repeated. Maximum 6 hrs. S/N/C only.

593 Independent Study (2-6) Faculty directed readings and investigation of specified topic in probability or statistics. Written report and oral presentation. Prereq: 2 courses in statistics and consent of the statistics department director of graduate studies. May be repeated. Maximum 6 hrs. S/N only.

595 Statistical Consulting Practicum (1-6) Supervised experiences helping on-campus researchers plan, manage data, and develop and perform analyses specific to designs and hypotheses. Discussion of activities in regular seminar meetings. Final written reports or/and detailed diaries. Prereq: 572 or 538. May be repeated. Maximum 6 hrs.

596 Computational Methods in Statistics (3) Up-to-date computational methods for statistics open architecture interactive computational languages supplemented by other statistical packages with graphical capabilities. Computer assisted statistical computing, numerical methods for linear models and generalized linear models, non-linear linear statistical methods, matrix computations and special matrices, essentials of Monte Carlo simulation, and resampling techniques. Knowledge of programming language and 572 or consent of instructor.


666 Advanced Statistical Process Control (3) Development of advanced SPC concepts; theory governing properties of Shewhart-type control charts. Comparisons with competing methodologies. Reading and discussion based on current literature. Prereq: 564 and 565.

673 Advanced Topics in Design of Experiments and Linear Models (3) Experimentation for product and process improvement: response surface methodology; optimal design methods; mixture experiments; optimal design topics; distribution of inference for linear models. Prereq: 570 or consent of instructor.

675 Categorical Data Analysis (3) Log-linear analysis of multidimensional contingency tables. Logistic regression. Theory, applications, and use of statistical software. Prereq: 1 yr graduate-level statistics, regression analysis and analysis of variance and familiarity with UNIX; or consent of instructor.

677 Statistical Modeling (3) Modern techniques of modeling: predictive, likelihood; Bayesian, and information-based model selection and model building paradigms. Application of techniques in various types of models for both continuous and discrete data modeling problems. Interactive computational tools. Prereq: 564 and 572 or 538, or consent of instructor.

679 Multivariate Statistical Modeling (3) Modern information based techniques and model selection in multivariate modeling: inferential tests of significance with multivariate data. Multivariate regression and variable selection, multivariate analysis of variance, and variable selection, multivariate regression. Principal component analysis, factor analysis and latent variable structural models with latent variables, mixture-model cluster analysis. Prereq: Matrix algebra and 564, or matrix and linear models, or consent of instructor. F

683 Special Topics in Statistics (1-3) Presentation of specialized topics in statistics. May be repeated. Maximum 6 hrs.
Theatre
(College of Arts and Sciences)

MAJOR DEGREE
Theatre ........................................ M.F.A.

Bill Black, Acting Head

Professors:
Black, W., M.F.A. ......................... Illinois
Custer, M., M.F.A. ......................... Wisconsin
Lester, L. W., Ed.D. ....................... Tennessee

Associate Professors:
Craven, E. H., M.A. ............................ Tennessee
DeCuir, L. J. (Liaison), M.F.A. .......... Tulane
Gould, B. K., M.F.A. ...................... Catholic

Assistant Professors:
Coleman, R., M.F.A. ..................... Yale
Van den Berg, Klaus, Ph.D. ........... Indiana
Weber, T., M.F.A. ......................... Alabama

The Department of Theatre offers the Master of Fine Arts degree with a major in Theatre, concentrations in costume design, international performance studies in acting, international performance studies in directing, lighting design, scene design, and theatre technology. Not all areas of concentration accept applicants every year. Applicants must have completed undergraduate degrees approximately equivalent in requirements to those specified for degrees conferred by The University of Tennessee. Three letters of recommendation and interviews with appropriate faculty are required of all applicants. Applicants for admission to the M.F.A. design/technical theatre programs must submit samples of their work. Auditions are required of M.F.A. degree acting applicants.

For detailed information about the graduate program, contact the Director of Graduate Studies, Department of Theatre.

THE MASTER OF FINE ARTS PROGRAM

At least 60 semester hours, 40 of which must be at the 500 level or above, are required for the degree of Master of Fine Arts with a major in Theatre, which is normally to be completed in three consecutive years of full time residence. Theatre 501 is required in the first year of residence. Three additional hours at the 500 level are required from history, literature, or dramaturgy. Students in the M.F.A. degree program are evaluated annually by juried performance or portfolio submission. Continuation in the program is with the approval of the faculty committee for the M.F.A. degree program. Theatre 599, Projects in Lieu of Thesis, and an oral defense of the project must be completed satisfactorily before the degree is conferred.

Additional to the core requirements listed above, each area of concentration has specific requirements:

Design/Technical Production
Required courses are at least 12 hours of Theatre 580, Design and Technical Production Seminar, and at least 6 hours in the projects courses. Theatre 401, Principles of Design is required in the first year of residence.

International Performance Studies in Acting
Theatre 520-21-22-23-24-25 Master Class are required, along with one course in directing and two hours each in voice and dance.

International Performance Studies in Directing
Theatre 530-31-32-33-34-35 Master Class are required along with Theatre 401 Principles of Design. Directing candidates are also expected to take art and music survey courses and language courses as advised.

REQUIREMENTS FOR SECOND MASTER’S DEGREE

Students admitted to the MFA program who have already earned a master’s or a doctoral degree may apply to 12 credit hours from the previous graduate program to the MFA degree with approval of the student’s committee, the Dean of the College of Arts and Sciences, and the Dean of The Graduate School.

Any such credits applied from a previous graduate program would be from courses that are directly relevant to the student’s MFA curriculum and must have been earned within the time limit (6 years) established for completion of the MFA degree.

GRADUATE COURSES

401 Principles of Theatrical Design (3) Fundamental principles of design, visual and structural relationships. Projects assigned to develop understanding and perception.

409 Stage Make-up (3) Study and problems in make-up design and application: character analysis. Prereq: Introduction to Theatre.

420 Special Studies in Acting (3) Content varies. Exercises in selected concentrated areas such as styles, techniques, approaches, e.g., Shakespeare, movement, humor. Prereq: Advanced Acting and consent of instructor. May be repeated. Maximum 9 hrs.

423 Period Movement and Dance (2) Movement styles and dances from Renaissance to 20th century. Prereq: Stage Movement or consent of instructor.

424 Theatre Dance II (2) Advanced dance technique incorporating elements of musical theatre. Prereq: Theatre Dance or consent of instructor. May be repeated. Maximum 6 hrs.

425 Selected Musical Theatre Techniques (2) Study and practice of musical theatre material: dance and vocal work. Prereq: Theatre Dance or consent of instructor. May be repeated. Maximum 4 hrs.

426 Applied Phonetics (3) Development of skills in transcriptions and re-creation of principal varieties of English Language in North America and selected foreign dialects in North America. Prereq: Consent of instructor.


445 Advanced Costume Construction I (3) Advanced studies in construction technique, tailoring, vacuum forming, plastic molding, and cobbling. Prereq: 345 or consent of instructor.

446 Costume Patterning (3) Draping patterns for periods of costume. Corsetry and study of historic patterns 1500-1800. Prereq: 345 or consent of instructor.

450 Advanced Scenery Technology I (3) Study of historical methods of construction, production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

451 Advanced Scenery Technology II (3) Study of historical methods of construction, production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

452 Advanced Scenery Technology III (3) Study of historical methods of construction, production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

546 Scenery Painting (2) Introduction to materials, techniques, and principles of craft. Gaining skill and understanding through studio experience. Prereq: Consent of instructor.


556 Scenery Painting (2) Introduction to materials, techniques, and principles of craft. Gaining skill and understanding through studio experience. Prereq: Consent of instructor.

462 Advanced Lighting Design (3) Advanced problems in lighting design and theory, lighting musical theatre, opera, and dance. Prereq: 362 or consent of instructor.

464 Computer Assisted Design for Theatre (3) Advanced techniques in computer assisted design for theatre. Prereq: CAD, Computer Drawing, Graphics, and/or 3D Modeling software for preparation of theatrical designs. Specific content varies with semester. Admission by consent of instructor only. May be repeated. Maximum 9 hrs.

470-71 Playwriting (3,3) Advanced instruction in writing of plays. Prereq: Consent of instructor.

491 Foreign Study (1-15) See College of Arts and Sciences.

492 Off-Campus Study (1-15) See College of Arts and Sciences.

493 Independent Study (1-15) See College of Arts and Sciences.

501 Introduction to Graduate Research in Theatre (3) Research tools and methods for theatre artists and scholars.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. 15 hrs.

510 Studies in Theatre History (3) Intensive study of selected topics. May be repeated. Maximum 9 hrs.

512 Dramatic Literature Analysis (3) Dramaturgical examination of plays, using techniques of analytical approach to the construction/disconstruction.

520-21-22-23-24-25 Master Classes in Acting (6,6,6,6,6,6) Master classes in acting technique, voice, and movement. Theatre MFA students only.

530-31-32-33-34-35 Master Class in Directing (6,6,6,6,6,6) Master classes in directing technique. Prereq: Admission to MFA program.

536 Projects in Play Directing (3) Practical work in play direction involving various lengths and kinds of scripts. May be repeated. Maximum 9 hrs.
Theory and Practice in Teacher Education

(College of Education)

MAJORS

DEGREES

Education ............................... M.S., Ed.S., Ed.D., Ph.D.

L. Knight, Leader

Professors:

Alexanders, J. Estell, (Emeritus), Ed.D. ................. Kentucky
Benner, Susan M., Ed.D. ................. Columbia
Brozo, William G., Ph.D. ................. South Carolina
Christensen, Mark A. (Emeritus), Ph.D. ................. Kansas
Collett, Laurence J., Ph.D. ................. Kent State
Davis, A. R., Ph.D. ................. Ohio State
Davis-Wiley, Patricia E.D. ................. Houston
Hargis, Charles H. (Liaison), Ed.D. ................. Colorado State
Harris, G. A., Jr., Ph.D. ................. Michigan
Hatch, J. Amos, Ph.D. ................. Florida
Huff, P. (Emeritus), Ph.D. ................. Ohio State
Hull, Howard N. (Emeritus), Ed.D. ....... Peabody
Jost, Carl J., Ed.D. ................. Oklahoma
Knight, Lester N., Ph.D. ................. Texas
Lindsey, LaVerne B., Ed.D. ................. Mississippi State
Long, Vena M., Ph.D. ................. Missouri (Columbia)
Rowell, C. Glennon, Ed.D. ................. George Peabody
Schindler, W. Jean, Ph.D. ................. Kent State
Watkins, J. Paul (Emeritus), M.S., Ed.S., Ed.D., Ph.D.

Associate Professors:

Cagle, Lynn C., Ed.D. ................. Georgia
Chance, Charles A., Ph.D. ................. Ohio State
Hannum, Michael C., Ed.D. ................. Northern Colorado
Hodge, E. L., Ph.D. ................. Texas
Judge, Sharon L., Ph.D. ................. California (Santa Barbara)
Meehan, Claudia T., Ph.D. ................. Ohio State
Puckett, Kathleen S., Ph.D. ................. Tennessee

Assistant Professors:

Bell, Sherry M., Ph.D. ................. Tennessee
Gilrane, Colleen P., Ph.D. ................. Illinois
Hendrick, D. A., Ph.D. ................. Alabama
Mollanen, Mark B., Ph.D. ................. Wisconsin
Rearden, Kristin T., Ph.D. ................. Texas

The Department of Theory and Practice in Teacher Education offers graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Education

Track 1-art education
Track 1-elementary education
Track 1-English education
Track 1-foreign language/ESL education
Track 1-mathematics education
Track 1-modified and comprehensive special education
Track 1-reading education
Track 1-science education

Track 1-social science education
Track 1-special education: early childhood
Track 2-art education
Track 2-elementary teaching
Track 2-modified and comprehensive special education
Track 2-secondary teaching
Track 2-special education: early childhood

Education Specialist

Education

Elementary education
English education
Foreign language/ESL education
Mathematics education
Reading education
Science education
Social science education

Doctor of Education

Education

Literacy, language education, and ESL education
Teacher education

Teacher Education

See Education under Fields of Instruction for full description of all degree requirements. The department also houses programs for students seeking licensure in early childhood, primary, and middle school education (grades K-8) and 1-8, reading endorsement, special education licensure, and secondary education and study programs. Early childhood licensure and degree programs are also available through the College of Human Ecology. The department houses three areas of interest: holistic teaching/learning, early childhood education, and secondary content teaching.

The holistic teaching/learning area's central emphasis is on holistic, integrative, and interdisciplinary teaching/learning as opposed to teaching disciplinary subject content (e.g., science, mathematics, foreign language arts) as separate entities. The focus on integration is similar to how children learn and how language is central to the teaching/learning process. The faculty believe that students should be prepared as teachers who can facilitate learning rather than merely dispense content. Central to the philosophy of holistic teaching and learning is knowing each individual child's learning style, abilities, and interests.

The early childhood education area is focused on the preparation of teachers for the education of all young children with and without disabilities in inclusive settings. Young children are defined as children from birth to age eight, including children of poverty, those of color, with disabilities, with advanced development and "mainstreamed" children.

The secondary content teaching area's mission is the preparation of teachers for instruction in art, ESL, English, foreign language, mathematics, social science and science. The emphasis is on how these disciplines are taught in context of different cultures.
Art Education

GRADUATE COURSES

510 History and Philosophy of Art Education (3) United States from 1860's to present. Prereq: Consent of instructor.

520 Studies in Art Education (3) Issues and topics current to the field of art education. Prereq: Consent of instructor.

530 Production and Critical Analysis of Art (3) Relationship of production and critical analysis of works of art to discipline-based art education.

540 Instructional Materials and Production Related to the Teaching of Art (3) Development and use of instructional aids concerned with all aspects of teaching art: videotapes, audiotapes, slides, charts, and learning aids.

Early Childhood Education

GRADUATE COURSES


515 Seminar (1-3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to goals of students' programs. May be repeated. Maximum 6 hrs. S/NC only.

554 Assessment in Early Childhood Special Education (3) Development of knowledge and skills in appropriate formal and informal assessments of handicapped infants and young children: screening, identification, diagnosis, placement and programming assessment issues. Prereq: 553 or consent of instructor.

566 Curriculum for Early Childhood Education (K-3) (3) Theoretical foundations and current research in content and skill areas of curriculum for kindergarten-grade 3: application to local school setting. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Sp,Su.

567 Application of Theory in Early Childhood Education (K-3) (3) Principles and practices from selected theoretical orientations. Prereq: Course in early childhood education or consent of instructor. May be repeated. Maximum 6 hrs. F,Su.


650 Advanced Studies in Early Childhood Education (3) Prereq: 2 graduate courses in early childhood education and consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

Elementary Education

Note: See Mathematics, Reading, Science, and Social Science Education for additional Elementary Education courses.

GRADUATE COURSES

421 Elementary and Middle School Science and Social Studies Instruction (3) Methods and materials for teaching science and social studies. Development of function, relationships and entities of two fields. Not open to students with recent course or background in teaching science and/or social studies. Prereq: Admission to teacher education. F,Sp

428 Language Arts/Reading Instruction in Elementary and Middle Schools (3) Language and language development as applied to teaching of reading, listening, and speaking; and aspects of literacy (reading process, oral language, and writing). Not open to students with recent course in language arts methods. Prereq: Admission to teacher education. F,Sp


505 Elementary and Middle School Teaching Methods II (6) Methods of teaching reading, language arts, science, social studies and mathematics; accommodation strategies for students with diverse needs. Prereq: Elementary and Middle School Teaching Methods I. Coreq: 576. F

523 Diagnosis and Correction of Children's Difficulties in Learning Mathematics (3) Children's difficulties in learning mathematics and procedures for helping classroom teacher correct difficulties. Prereq: 522 or equivalent or consent of instructor. Sp

524 Teaching for Creative Thinking and Expression (3) Creative and constructive potential of each child's experience; creative potential across academic curricula. Prereq: Consent of instructor. F

526 Teaching Language Arts Elementary and Middle School (3) Recent trends in current materials and methods in teaching elementary language arts (except reading). Prereq: Course in language arts or consent of instructor. Sp,Su.

529 Practicum in Diagnosis and Remediation of Difficulties in Learning Mathematics (3) Assessment and practical experience with children having difficulties in learning elementary school mathematics. Prereq: 523 or consent of instructor. Su

530 Assessment and Correction of Language Arts Difficulties (3) Procedures for diagnosing and correcting language arts difficulties; analysis of children's work. Prereq: At least one language arts course or consent of instructor. Su

568 Research in Elementary Education (3) Analysis of research in elementary education with application to classroom teaching. Prereq: Research course. Su

651 Advanced Studies in Elementary School Language Arts (3) Selected issues in elementary school language arts. Prereq: Graduate course in elementary school language arts or consent of instructor. Sp,

English Education

GRADUATE COURSES


460 Teaching Reading and Literature in the Secondary School (3) Approaches for teaching basic reading skills and ways of teaching literature. Sp

461 Developing Reading Skills in Content Fields (3) Techniques for teaching reading and study skills in content areas of school program. Prereq: 460. F

470 Teaching Poetry Grades 7-12 (3) Theoretical and practical approaches to teaching English in middle school. May be repeated. Su

592 Linguistic and the Teaching of English (3) Grammar, usage, semantics, dialectology, history of language and lexicography. F

597 Teaching Drama Grades 7-13 (3) Strategies and materials for teaching creative dramatics, enacting and writing of plays, reading of scripts. Sp

608 Developing Speaking and Listening Skills, Grades 7-12 (3) Approaches to nonverbal communication, interpersonal and group communication, public address and listening. Prereq: Consent of instructor. Su

590 Seminar in Teaching English in Secondary Schools (3) Content varies. Theoretical and practical approaches to teaching English in secondary school. May be repeated. Su

Foreign Language/ESL Education

GRADUATE COURSES

455 Teaching of Foreign Languages, Grades 7-12 (3) Instructional methods, lesson planning, peer-teaching, materials for teaching foreign language and culture, evaluation of techniques. Required for certification in modern foreign languages and Latin. Prereq: Completion or near completion of foreign language hours for certification and Admission to teacher education.

555 Foreign Language in the Elementary Schools Practicum (3) Experiences designing, implementing and assessing second language instruction in elementary school setting. Prereq: 587 or consent of instructor.

556 English as a Second Language Practicum (3) Experiences in teaching English as a second language. Required for ESL certification. Prereq: Consent of instructor.

578 Teaching English as a Second Language (3) Theoretical and practical approaches to teaching English as a second language. Prereq: Consent of instructor.

687 Advanced Studies in English as a Second Language (3) Research, curricula, assessment, trends
and issues in English as a second language. Prereq: 576 or consent of instructor.

687 Advanced Studies in Foreign Language Education (3) Research, curricula, assessment, trends and issues in foreign language education. Prereq: 587 or consent of instructor.

Mathematics Education

GRADUATE COURSES

485 Teaching Mathematics, Grades 7-12 (3) Preparation of teaching plans, evaluation, materials, for teaching mathematics; teaching simulation and directed observation in schools. Prereq: Admission to teacher education.

522 Programs and Materials in Elementary School Mathematics (3) Examination, development and use of materials for creating an active learning environment for learning mathematics in elementary and middle schools. Prereq: 530, 543, or equivalent.

530 Teaching Mathematics to Young Children: K-4 (3) Unit planning, daily planning, grouping and other strategies of teaching mathematics. For those with little preparation in teaching elementary school mathematics. Prereq: 530, 543, or equivalent.

543 Teaching Mathematics in Middle School: 5-8 (3) Unit planning, daily planning, grouping and other strategies of teaching mathematics. For those with little preparation in teaching middle school mathematics. Prereq: 485 or equivalent.

581 Seminar in Mathematics Education (3) Current issues influencing instruction in mathematics in schools, elementary through college. Related teaching methodologies. Opportunities for work on special problems. Prereq: 485 or equivalent.

582 Teaching Enrichment Mathematics in Middle and Junior High Schools (3) Topics to enrich middle and/or junior high mathematics. Geometrical, laboratory, and problem solving activities. Special attention to metric system. Opportunities for individual projects. Prereq: 485 or equivalent.

583 Teaching Mathematics in Senior High Schools and Community Colleges (3) Topics appropriate for high school and community/junior college mathemati- cians curriculum. Special problems related to enrichment, problem solving, and use of microcomputers. Opportunities for special projects. Prereq: 485 or equivalent.

586 Teaching Probability & Statistics (3) Teaching of probability and statistics in schools, elementary through college. Probabilities and statistical experiments, demonstrations, and applications. Prereq: 485 or equivalent.

583 Advanced Studies in Mathematics Education (3) Analysis of current research in mathematics education and implications of research for classroom practice. Prereq: Two graduate courses in mathematics education.

Reading Education

GRADUATE COURSES

430 Elementary and Middle School Developmental Reading Instruction (3) Word recognition (including phonics), comprehension, evaluation, and materials. Not open to students with recent course in reading methods. Prereq: Admission to teaching education.

434 Topics in Reading Education (1-6) Prereq: Admission to teacher education and course in reading education. May be repeated. Maximum 6 hrs.

530 Teaching Reading in Elementary and Middle Schools (3) Trends in methods, materials, basic approaches, skill development and assessment procedures for teaching reading at elementary school level. Prereq: Course in teaching of reading or consent of instructor.

534 Seminar in Reading Education (1-6) May be repeated. Maximum 6 hrs.

536 Psychology of Reading (3) Reading act, relationship between learning theory and reading, role or reading in child's overall intellectual development. Affective and cultural factors. Prereq: 500-level course in reading education or consent of instructor.

537 Diagnosis and Correction of Classroom Reading Problems (3) Procedures, methodologies and materials for diagnosing and correcting classroom reading problems. Prereq: Course in reading education, or equivalent teaching experience, or consent of instructor.

538 Practicum in Diagnosis of Reading Problems (3) Theoretical and practical applications of specific reading diagnostic instruments; testing of elementary and/or secondary school students; preparing case study reports, and conducting parent conferences. Prereq: Course in diagnosis and correction of classroom reading problems or consent of instructor.

539 Practicum in Remediation of Reading Problems (3) Application of learning and teaching methodology in working with elementary and/or secondary school students on one-to-one or small group basis. Prereq: Course in diagnosis and correction of reading problems or consent of instructor.

554 Developmental Reading Practicum (2) Diagnosing and teaching children having developmental and corrective reading needs. Prereq: Course in diagnosis and correction of reading problems or consent of instructor. May be repeated. Maximum 4 hrs.

602 Seminar in Reading Education (1-6) May be repeated. Maximum 6 hrs.

603 Advanced Studies and Theoretical Models of Reading (3) Research on reading processes. Current theoretical models related to how children process print. Prereq: 500-level courses in reading education or consent of instructor.

681 Seminar in Social Studies Education (3) Research, trends, and issues in secondary social studies. Prereq: Admission to teacher education program.

Science Education

GRADUATE COURSES

496 Teaching Science Grades 7-12 (3) Methods, materials, recent trends in science and environmental education programs for secondary schools. Prereq: Admission to teacher education.

531 Teaching Science in Elementary and Middle Schools (3) Recent trends in methods, materials and content in teaching elementary school science. Prereq: Course in teaching elementary school science or consent of instructor.

565 Instructional Trends and Issues in Science Education (3) Analysis of current trends in science instruction, instructional issues facing elementary, secondary, and community college science teachers, and application of learning theory to teaching biological, physical, and environmental sciences. Prereq: 496, teaching methods, or equivalent.

572 Nature of Mathematics and Science Education (3) Teaching and assessment of mathematics and science based upon student conceptions of nature of mathematics and science.


696 Research Trends in Science Education (3) Analysis of current research trends in science education and relationship of such trends within broader educational community. Prereq: 628.

Social Science Education

GRADUATE COURSES

454 Teaching Strategies and Issues in Social Studies Education (3) Goals, objectives, techniques, materials, and evaluation; directed observation in public schools, preparation of teachingpackages and materials; simulated teaching experiences. Prereq: Admission to teacher education.

521 Teaching Social Studies in Elementary and Middle Schools (3) Planning and techniques. Trends in curriculum, development of concepts and generalizations, integration of social sciences. Prereq: Course in teaching of social studies or consent of instructor.

525 Strategies, Programs, and Materials for Teaching Elementary Social Studies (3) Analysis of new and innovative social studies program materials and techniques. Exploration of current trends in social studies education. Prereq: Previous course in teaching of social studies or consent of instructor.


599 Seminar in Social Studies Education (3) Research, trends, and issues in secondary social studies.

621 Seminar in Social Studies Research and Theory (3) Status of research and theory. Needed research, related research from other fields, and application of research. Prereq: Recent course in teaching of social studies or consent of instructor. May be repeated. Maximum 4 hrs.

Special Education

GRADUATE COURSES


420 Field Experience in Modified Programs (3) Practicum in teaching in modified programs; planning, implementing, and evaluating instruction. Prereq: Special Education Principles, Special Education Strategies, and admission to educator education program. Coreq: 420. S/C only.

431 Field Experience in Comprehensive Programs (3) Prereq: Special Education Principles, Special Education Strategies, and admission to educator education program. Coreq: 430. S/C only.

432 Psychology and Education of Students with Moderate/Severe Disabilities (6) Nature and characteristics of individuals with moderate/severe disabilities and educational strategies appropriate for these persons. Prereq: Special Education Principles, Special Education Strategies, and admission to educator education program.


456 Speech and Language Basis of Learning Disabilities in the Classroom (3) Normal communication development; understanding of speech and language impairments in school-age students; integration of oral/Written, or equivalent, into existing curriculum, especially for high incidence special education students.

470 Psychology of the Exceptional Child (3) Varieties of exceptional children; general characteristics and educational needs. Implications of developmental
Variations for functioning as adults. Opportunity to expand study upon particular exceptionality. Enrollment limited to non-special education majors.

504 Clinical Experience in Teaching and Supervision of Exceptional Children (3-9) Placement in educational settings. May be repeated Maximum 9 hrs. S/N or letter grade. (Same as Rehabilitation and Deafness 504.)

506 Internships in Teaching in Special Education and Rehabilitation (3-15) Placement in professional settings in public schools or agencies under supervision of master practitioners. Enrollment limited to those in fifth-year program. S/N only.

553 Assessment of Exceptional Students (3) Current issues related to assessment of learning; advanced study of evaluation models for special education; dynamic and other innovative assessment approaches; advanced study of application to educational programming: basic statistics and application in assessment.

555 Characteristics of Affective/Motivational Functioning in Children with Disabilities (3) Definition, methods, identification and symptoms of children with affective/motivational development in disabled youngsters. Comparison to normal development and that of children labeled disturbed or behavior disordered.

556 Instructional Systems for Affective/Motivational Education for Children with Disabilities (3) Educational strategies and models of instruction; simulation, demonstration, and media. Teaching techniques, materials, and teacher/pupil/parent interactions. Therapeutic forms of education through art, music, role play, puppetry, and group interactions. Prereq or coreq: 555 or consent of instructor.

557 Positive Preventive Discipline (3) Instructional, classroom, and preventive/protective strategies for use in classroom which positively affects efficiency of classroom. Research on how curriculum can encourage appropriate interactions of children and youth. Prereq: Admission to graduate program.

558 Neuromuscular and Health Disorders: Educational Implications (3) Neurological impairments, physical disabilities and special health conditions. Autistic. Investigation of instructional techniques and adaptations.

564 Psychosocial Development of Gifted and Talented Children (3) Phenomena of talent development in context of home, school, and society. Implications of malfaturation. Practices for promoting social and emotional development. Prereq: 451 and 452 or equivalent or consent of instructor.

565 Instructional Systems for the Gifted and Talented (3) Instructional methods and systems evaluated in terms of effectiveness in various educational environments. Prereq or coreq: 564 or consent of instructor.

575 Creative Problem-Solving Strategies for Special Educators (3) Techniques for solving problems encountered by special educators in any setting.

586 Seminar in Research Techniques in Special Education (3) Evaluation of appropriate research methodologies with handicapped populations.


590 Application of Microcomputer Technology in Special Education and Vocational Rehabilitation (3) Application of microcomputer technology with emphasis on categories of exceptionalities and across all chrono- logical and functional age ranges. Microcomputer adaptive software, special switch access, authoring systems, telecommunication, and strategies for cognitive development.

592 Internship in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitio ner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/N or letter grade.

593 Theory and Practice in Teacher Education

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May be used toward degree requirements. May be repeated. S/N or letter grade. E


517 Seminar in Theory and Practice in Teacher Education (3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to student's programs. May be repeated. Maximum 6 hrs. S/N or letter grade. E

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Action Research and Practical Inquiry in Education (3) Principles of action research and practical inquiry for practitioners in early childhood and adolescence settings and methods for conducting such inquiries in professional role. Prereq: Admission to graduate program.

521 Clinical Studies (4) Relationship between educational theory and application during internship; research project, development of portfolio, and capstone experience.

533 Independent Study (1-3) May be repeated. S/N or letter grade. E

534 Supervised Readings (1-3) May be repeated. S/N or letter grade. E

535 Special Topics (1-3) May be repeated. S/N or letter grade. E

536 Clinical Experience in Assessment and Instruction (3) Academic remediation applied in labs/field settings; tasks related to teaching: assessment, preparation of lessons, and delivery of instruction. Coreq: 533. S/N or letter grade. F

600 Doctoral Research and Dissertation (3-15) Required for those who are not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May be repeated. S/N only. E

601 Internship in College Teaching and Supervision (3-15) Supervise teaching and supervision. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/N only.

617 Trends and Issues in Curriculum and Instruction - An Interdisciplinary Perspective (3) Current trends and issues in field of curriculum and instruction. Prereq: Admission to Ed.S. program.


629 Internship (1-3) Experience in principles and practices of curriculum development and instructional improvement. Prereq: Program prerequisites and consent of instructor. May be repeated. Maximum 9 hrs. S/N only.

630 Independent Study (1-3) May be repeated. S/N or letter grade. E

636 Supervised Teaching (1-3) May be repeated. S/N or letter grade. E

638 Special Topics (1-3) May be repeated. S/N or letter grade. E

645 Experimental Medicine (3) Hours English literature, speech, music, art, philosophy, religion, economics, anthropology, political science, psychology, sociology and geography. **Exclusive of laboratory. ***It is expected that this requirement will be fulfilled by a course in cellular or molecular biology.

Admission Procedures

Admission of new students is for the fall semester, with first priority given to residents of the state of Tennessee. The College of Veterinary Medicine utilizes the Veterinary Medical College Application Service (VMCAS) for all applicants. Forms and instructions for making application for admission may be obtained beginning June 1, 2000 from the Office of the Associate Dean, University of Tennessee, College of Veterinary Medicine, P.O. Box 37901-1071, Knoxville, TN 37901-1071.

Note: The deadline for receipt of the completed application materials by VMCAS is November 1. NON-TENNESSEE APPLICANTS MUST HAVE A MINIMUM CUMULATIVE GRADE-POINT AVERAGE OF 3.2 ON A 4.0 SCALE FOR APPLICATION TO BE CONSIDERED.

Applications are accepted only from U.S. citizens or permanent residents of the U.S.
D.V.M. Curriculum

The curriculum of the College of Veterinary Medicine is a nine-semester, four-year program. Each class begins in August and graduates four years later in May. The first three years generally follow the traditional fall and spring semesters. With the summer break following years one and two. The final year of the professional curriculum begins immediately following semester six and is a continuous clinical rotation experience extending over 54 weeks.

Development of a strong basic science foundation is emphasized in the first year. Courses consist mostly of preclinical subjects of anatomy (gross and microscopic), physiology, immunology, bacteriology, virology and parasitology. Also included in the first year are clinical subjects of physical diagnosis and epidemiology. Considerable integration of subject matter is incorporated during this year.

The second and third years include the study of diseases, their causes, diagnosis, treatment and prevention, and courses are team-taught on an organ system basis.

The final year (three semesters) is devoted to intensive education in solving animal disease problems involving extensive clinical experience in the Veterinary Teaching Hospital. Each student will participate exclusively in clinical rotations in the Veterinary Teaching Hospital and in required externships (preferably off-campus).

Innovative features of this curriculum include: eight weeks of student centered, small group, applied learning exercises in semesters four through six; three weeks of dedicated clinical experiences in the Veterinary Teaching Hospital in semesters three through five; and elective course opportunities in semesters four, five and six which allow students to focus on individual educational/career goals. Students enrolled in the D.V.M. program are required to complete at least 14 credit hours in the sixth semester and may register for up to 10 credit hours of graduate courses without enrolling in The Graduate School and these hours will be counted toward the D.V.M. degree.

Elective study offers a unique educational alternative for students interested in the Doctor of Philosophy degrees. Because of the interdisciplinary departmental administration of the College of Veterinary Medicine, the faculty have opportunities in the graduate programs of other instructional units, including Animal Science (nutrition, physiology, genetics and animal management), Microbiology (bacteriology, virology and immunology), Ecology and Evolutionary Biology (environmental toxicology), Public Health, and Comparative and Experimental Medicine. (Refer to other sections of this catalog for a full description of these programs.) The majority of the graduate students and graduate faculty of the College of Veterinary Medicine are involved in the Comparative and Experimental Medicine program. This program provides a wide spectrum of interclinical training that prepares for teaching and/or research careers in the health sciences.

PROFESSIONAL COURSES

801-02-03 Application Based Learning Exercise (ABLE), I, II, III (2, 2, 2) Small group, student-centered learning sessions with faculty facilitator for self-discovery of new information. Weekly sessions based on specific clinical case or problem, and integration of basic science and clinical material. S/C only.

804-05-06 Application Based Learning Exercise (ABLE) and Clinical Exposure I, II, III (2, 2, 2) Weeklong small group, student-centered learning sessions with faculty facilitator for self-discovery of new information based on specific clinical case or problem; integration of basic science and clinical material. One week of clinical experience through participation in specific clinical rotations in Veterinary Teaching Hospital.

811 Infection and Immunity I—Bacteriology and Mycology (3) Fundamental aspects of microbiology and cell biology relating to pathogenesis of bacterial and fungal diseases of animals: antimicrobial actions and mechanisms of bacterial resistance. General approaches to diagnosis, treatment and prevention.

813 Infection and Immunity II—Immunology (2) Basic biology and practical aspects of immunology: cells of immune system, immune function and dysfunction, immunodiagnostic techniques and specific diseases involving immune system.

814-16 Clinical Correlations and Ethics I, II (1, 2) Correlations between basic science material from concurrent courses and practice of veterinary medicine. Thought on current issues in veterinary ethics. S16—Student-led discussions follow faculty presentations.


821-22 Veterinary Anatomy I, II (6, 6) Integrated approach to study of developmental, macroscopic (gross) and microscopic anatomy of common domestic animals. Dissections of embalmed specimens of common domestic species for comparative purposes. Microscopy relates structure with function. Study of developmental anatomy related to normal and abnormal conditions.

823-24 Physiology I, II (4, 4) Introduction to concepts and problems in physiology which form basic clinical applications and for training in pharmacology, medicine, pathology, and surgery: Cellular, neural, cardiovascular, renal, respiratory, digestive, endocrine, and reproductive physiology.

827 Special Problems in Animal Science I-III (1-8) Extramural and specially designed study for students interested in selected topics in animal medicine, veterinary pathology, and veterinary public health.

831 Physical Diagnosis I (Basic care, feeding, restraint, and handling domestic animals. Introduction to physical examination and diagnostic techniques used by veterinarians.

832 Anesthesiology (2) Principles of anesthesiology: pharmacology of anesthetic agents, and introduction to anesthetic techniques in veterinary medicine.

833 Epidemiology and Evidence Based Medicine (2) Study of distribution and etiology of disease in animal populations. Use of knowledge (evidence) gained from management of clinical patients in past to improve future clinical decision making processes.

834 Hematopoietic System (2) Pathophysiology and diagnosis of disorders involving bone marrow and blood cells, platelets, and blood coagulation in domestic animals; interpretation of laboratory test results using an integrative clinical approach.

835 Principles and Practice of Surgery (2) Principles of surgical anatomy; aseptic technique, patient and surgical preparation, control of surgical hemorrhage and infection, and general operating room procedures. Proper methods of tissue handling, surgical instrumentation, and selection of sutures and suturing patterns. Pathophysiology of surgical and accidental wounds: wound healing and management.

836 Toxicology (2) Principles of toxicology, molecular mechanisms, pathologic processes and clinical features of animal diseases caused by common toxic agents.

837 Food Hygiene and Zoonoses (2) Host-agent relationships, public health aspects of veterinary medicine and role of veterinarians in ecology and food hygiene.

840 Integumentary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of integumentary system. Laboratory examination, pathology, diagnosis and treatment.

841 Reproductive System (4) Pathophysiology, special pathology, medicine and surgery of diseases of male and female reproductive systems and mammary glands.

842 Alimentary System (4) Pathophysiology, special pathology, medicine and surgery of diseases of alimentary systems.

843 Musculoskeletal System I (3) Pathophysiology, clinical description and basic treatment modalities of common diseases and conditions of skeletal system of small animals. Development of basic diagnostic and treatment skills.

844 Musculoskeletal System II (3) Pathophysiology, special pathology, medicine and surgery of diseases of musculature and skeletal systems. Advanced principles, radiographic interpretation and surgical procedures.

845 Veterinary Nutrition (2) Principles of nutrition, and nutrition of animals in health and disease. Applied nutrition relating to individual small or large animal patient or to herd situations.

846 Multispecies Medicine (4) Anatomy, pathophysiology, medicine, and surgery of avian species, laboratory and zoo animals and reptiles. Species and diseases seen by practicing veterinarian. Current topics on foreign animal diseases.

851 Urinary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of urinary system. Urinary system in health and disease.

852 Cardiovascular System (2) Pathophysiology, special pathology, medicine and surgery of diseases of cardiovascular system. Anatomic, physiologic and pharmacologic principles which provide basis for treatment.


854 Respiratory System (3) Pathophysiology, special pathology, medicine and surgery of diseases of respiratory system. Upper and lower respiratory system: infectious and noninfectious diseases.

855 Radiology (3) Basic, advanced and special techniques in radiology with interpretation and use of radiologic and related techniques in diagnosis and treatment of animal diseases.

856 Special Senses (2) Pathophysiology, special pathology, medicine and surgery of diseases of visual and auditory systems.

857 Nervous System (3) Pathophysiology, special pathology, medicine and surgery of diseases of nervous system: clinical neurology and neuropathology.

858 Neurology/Ophthalmology (4) Clinical training in specialties services: ophthalmology and neurology. Direct responsibility for diagnosis, patient care, and treatment of patients in both large animal and small animal clinical services.
FACILITIES FOR RESEARCH AND SERVICE
Facilities for research and service
Facilities for Research and Service

Bureau of Evaluation, Research, and Service
(College of Education)
Ian R. Rockett, Director

The Bureau is responsible for the coordination of research and evaluation activities and for the development of college research and service activities based in external funding. In addition, it may be called upon to provide brokering services to connect faculty expertise with needs for consultant services, technical assistance, and possible professional development activities. The Bureau directly coordinates select development of research proposals, as well as college grant and contract review, administration, and fiscal processes. The Bureau also provides the administrative home for the interdisciplinary Center for Literacy Studies, the Appalachian Rural Systemic Initiative Resource Collaborative, and the High School Equivalency Program (Migrant Education).

Center for Business and Economic Research
(College of Business Administration)
William Fox, Director

In its economic research endeavors, CBER today has the same basic mission determined at its inception over 60 years ago at the request of the Tennessee Legislature—to produce and disseminate new information in the field of economic research and in the specific areas of regional economic development and fiscal policy. The mission has also expanded to include influencing decision quality in the public and private sectors and integrating departmental research through cooperative ventures in the international arena. In addition to the annual Economic Report to the Governor and the biennial Tennessee Statistical Abstract, the Center publishes research on a wide range of socioeconomic and policy issues, including taxes, banking, telecommunications, environmental concerns, and employment prospects.

While its core mission remains little changed, the scope of the CBER unit has expanded from a largely individualistic fiscal assistance program to a regional economic research, policy analysis, and communications technology arm of the College of Business Administration. With a staff of three senior research faculty and a support staff in areas of research, information technology and information dissemination, CBER is located at 100 Glocker.

Center for Executive Education
(College of Business Administration)
John E. Riblett, Director

The College of Business Administration's executive/management education efforts are facilitated through the Center for Executive Education, 708 Stokely Management Center. The mission of the Center is to promote the learning and dissemination of an integrated framework of managerial excellence. The Center defines excellence in terms of competitive world standards of quality, efficiency, and service to the recognized concerns of all constituencies (customers, employees, suppliers, owners, students, and society in general). This mission includes the accepted responsibility for (1) developing close strategic partnerships with a selected set of companies to better facilitate learning and development of the knowledge which is truly externally valued, and (2) acting as a facilitator in driving this knowledge into the credit curriculum of the College.

The Center prides itself on the development of long-term relationships with organizations that provide a living laboratory to test and validate the new knowledge of the Center that is disseminated in a variety of forms. Executive and Management Education Programs are one form of dissemination. The Center has provided custom and public programs for 80 of the Fortune 500 companies.

The Center emphasizes consistent, high-quality programming, small class sizes, outstanding faculty who bring the added value of experience in the private and public sectors to the classroom, a highly interactive style of instruction, and an applied orientation. The focus is on longer term, more developmentally oriented programs of one to four weeks in length such as the four-week University of Tennessee Executive Program, three-week Practical Strategies for Process Improvement Institute, and one-week Lean Enterprise Systems Design Institute.

Center for Information Studies
(School of Information Sciences)

The Center for Information Studies (CIS) was established in June 1989 to be a focal point for research related to information systems and services. The Center, located at 304 Temple Court, has performed research for the federal government, state and local governments, and business and industry. Projects have ranged from strategic planning efforts to information system and service evaluations, to modeling of scientific and technical communication. Staff of the Center have been actively involved in proposal development and project performance with faculty and staff in other centers and departments at the University.

Areas of interest to the Center include information systems design, information organization and retrieval in very large databases, directories and locator tools in a networked environment, design of regional
library and information system networks, new technology applications, information system support for educational reform, modeling of information processes, development of measures and methods for evaluating information system performance and effectiveness.

Center for Literacy Studies
(Office of Research)

The Center for Literacy Studies was founded in 1988. The Center's purpose is to bridge theory and practice in the field of adult learning and literacy. To achieve its purpose, the Center collaborates with practitioners, policy makers, and other research organizations on projects that address five common themes: 1) building the capacity for literacy delivery systems that can meet the needs of a changing society; 2) building partnerships with practitioners who are working to make changes in their practice of adult education; 3) developing innovative approaches to adult learning and literacy; 4) developing innovative technology applications for the field; and 5) disseminating results to the field.

Center for Physical Activity and Health
(College of Education)

The mission of the Center for Physical Activity and Health is to integrate scientific research, education, and practical applications of exercise and health science in a manner that enhances health, fitness, performance, and quality of life. The Center is a service-oriented organization designed to educate the UT and Knoxville communities about the benefits of regular physical activity as well as warn about the serious potential health outcomes of a sedentary existence.

The Center focuses its efforts in four main areas: training future leaders in exercise promotion, providing exercise opportunities for members of the UT community, promoting exercise within the UT and Knoxville communities, and providing exercise testing and assessment.

For additional information about services, contact Dr. Dixie L. Thompson at (865) 974-1271 or via email at dixlee@utk.edu.

Center for Transportation Research
(Office of Research)

Stephen H. Richards, Executive Director

The Center for Transportation Research, formerly the Transportation Center, was created in 1970 to foster and facilitate interdisciplinary research, public service, and outreach in the field of transportation at the University of Tennessee. It began operating full-time in 1972 and since then has contributed greatly to the overall research program of The University.

The Center, 600 Henley St., Suite 309, is a University-level organization administratively positioned within the Office of Research at UT. The Center's multidisciplinary staff includes over 120 full-time researchers and technicians augmented with numerous faculty and students. The Center is currently organized into four major divisions: Logistics and Systems Analysis; Infrastructure and Environment; Safety and Traffic Operations; and Mobility Services and Policy.

The Center has three goals. The first is to conduct a program of research in transportation that is recognized for its excellence, comprehensiveness, innovation, productivity, and national leadership. The second is to develop and maintain a world-class research program within the various departments and colleges of UT. The third goal is to serve the transportation research, service, and training needs of state and local government, business, and industry in Tennessee, the southeast region, and the nation.

Center for Excellence for Materials Processing

The Center for Materials Processing is one of the "Centers of Excellence" created by the State of Tennessee. It has an interdisciplinary program designed to bring together individuals with appropriate expertise to solve important materials processing problems. It emphasizes 1) the development of desirable materials properties through the control of composition, molecular structure, and microstructure, 2) measurement of process variables, and 3) control of those variables to ensure proper processing. The Center conducts basic research and teaching in materials processing and carries out research to improve existing processing technologies and transfer of research results to private industry. A major aspect of the Center is student participation in industry-sponsored research programs.

The Center is located in 513 East Stadium Hall, 974-0816. For further information, contact Dr. C. J. McHargue, 974-7680.

Centers and Chairs of Excellence

In 1984, the General Assembly appropriated and the governor approved $10 million for the first Centers of Excellence throughout the state. The public colleges and universities submitted their proposals for Centers of Excellence to the Tennessee Higher Education Commission, which made the final determinations. Now four of the University's ten Centers of Excellence are sponsored by UT or located in Knoxville.

Concurrently, the University has received state funding which it must match dollar for dollar, for Chairs of Excellence. These Chairs are $1 million endowed professorships in areas of significance to the University and to the individual, foundation, or corporation providing the matching gift money. Chairholders are noted within their respective academic units. The Chairs of Excellence are:

- Bernard E. Schmitt Chair of Excellence in History
- Benard Blasingame Chair of Excellence in Agricultural Policy
- Chair of Excellence in Science, Technology, and Medical Writing
- Clayton Homes Chair of Excellence in Finance
- College of Business Administration Chair of Excellence in Policy Studies
- Condra Chair of Excellence in Computer Integrated Engineering and Manufacturing
- Condra Chair of Excellence in Power Electronics Applications
- Goodrich Chair of Excellence in Waste Management and Environmental Engineering
- Hodges Chair of Excellence of English
- J. Fred Holly Chair of Excellence in Political Economy
- Nancy Gore Hunger Chair of Excellence in Environmental Studies
- UT Willis Lincoln Chair of Excellence in Physics
- Pilot Chair of Excellence in Management
- Ivan Racheff Chair of Excellence of Ornamental Horticulture
- Ivan Racheff Chair of Excellence in Materials Science and Engineering
- Forrest & Patsy Shumway Chair of Excellence in Romance Languages

The combination of the Centers of Excellence and Chairs of Excellence adds a dimension to The University of Tennessee that is not easily equaled by other institutions. UT's reputation as the premier university in the southeast region and the nation adds a dimension to The University of Tennessee.
Communications Research Center
(College of Communications)

The Communications Research Center, 426 Communications Bldg., is an adjunct to the communications graduate program. Objectives of the Center are: (1) to conduct original research in mass and public communications; (2) to disseminate research-generated information; and (3) to provide research services to faculty, students, professional communicators, and others interested in improving the quality of human communications.

Division of Information Infrastructure

The Division of Information Infrastructure (DII) provides computing and telecommunication resources and services for students, faculty, and staff. DII consists of four operating units: Computing and Networking Services, Customer Technology Support, Innovative Technologies Collaborative, and Telephone Services. Information about DII is available on the website http://www.utk.edu/technology/.

DII provides the core information technology infrastructure for The University of Tennessee. DII provides public-access computer labs, central computing, administrative information systems and network services, as well as information security for UT.

Individual computer accounts are provided at no charge for all UT students, faculty and staff for the duration of their affiliation with UT. These accounts may be used for e-mail, coursework, research, and personal Web pages. Information and on-line registration for computer accounts is available at http://dii.utk.edu/accounts.html.

Students on the Knoxville campus may access the Internet through direct Ethernet or dial-up accounts. For on-campus students, each dorm room is provided with two switched 10 Mbit Ethernet ports. For off-campus students, the Enhanced Remote Access (ERA) pool is sustained by 756 modems supporting 56 Kbps analog and 64Kbps/128Kbps ISDN connections. Complete information on this service is available at http://dii.utk.edu/students/remote_access/ and http://www.dii.utk.edu/students/voresnet/.

To provide access to computing facilities on campus, DII maintains six staffed computing labs, 15 unstaffed labs, and supports computing installations in residence halls. The computing labs are equipped with more than 300 microcomputers and eight workstations including current models of Apple, IBM, Sun, Dell, and Gateway machines. In addition, there are laser printers, scanners and zip drives available. A variety of industry-standard software applications are available for use on the machines in the computing laboratories. Please refer to http://www.dii.utk.edu/labs.html for more information.
grams, how to use the CBT courses, how to use Webmail, Lotus Notes or Pink, how to surf the Internet on both Netscape and Microsoft Explorer, and how to access the campus computer system through a modem. No question is too basic. Introductory PC and Macintosh skills are taught, even things as simple as using a mouse. After-hours consulting can be arranged on an emergency basis.

ENHANCED REMOTE ACCESS (ERA) AND SUPPORT

DII supports approximately 6,000 users of ERA. Currently DII provides up to 128K ISDN connections and 56K analog connections. Any UT student, staff, or faculty member can obtain an ERA account that will give them access to the UT computer network, computer resources, and Internet access, all from home. The cost of these services is below that of an off-campus vendor and is further reduced for students by the Technology Fee. The Enhanced Remote Access office is located on the 103 Acconda Court (corner of Volunteer and Cumberland). The ERA office personnel will help set up accounts as well as provide technical assistance either over the phone or for walk-in customers.

COMMUNICATIONS SOFTWARE DISTRIBUTION

DII distributes communications software to students, faculty and staff through the Enhanced Remote Access office located in room 103 Acconda Court. This software is free of charge. The software can be used to access the resources on the UT network and the Internet. Programs are provided for both PC and Macintosh computers and are available on CD. These software packages allow a person to check e-mail, surf the Web and transfer files.

DORM ETHERNET CARD INSTALLATION

DII has wired every dorm room on campus for network access. Each network port in the rooms is a 10Mbps dedicated Ethernet connection. Students living in the dorms with network capable computers will be connected free of charge. Students with computers which do not have network cards installed may obtain a network card at a reduced price. Technicians are available to install the network card and communications software free of charge.

TECHNOLOGY TRAINING

Several courses are offered aimed at improving skills with the technology available at UT. For example, "Life Preserver: An Introduction to UT Computing," is offered several times each semester on supported application software and operating systems. Other courses include those about MS Office products, using the Internet and search engines, and Web Page Essentials which offers four levels of HTML training. There is also a series of courses on Adobe Photoshop.

COMPUTER-BASED TRAINING

Computer-Based Training (CBT) is a self-paced series of interactive, Web delivered, learn-as-you-go courses offered on many computing topics. CBT offers courses for Microsoft products (Word, Excel, etc.), Lotus Notes (database management, etc.), Internet topics (Internet basics, How to create a Web page, etc.), and more advanced topics, such as JavaScript, Visual Basic, object-oriented techniques, and open systems. There are over 500 courses available. This training is free to UT students, faculty, and staff. For registration and access to the CBT courses on the Web go to DII-UTK.EDU and click on "CBT."

STATISTICAL AND COMPUTATIONAL CONSULTING CENTER

The mission of the Center is to enhance the quality of research by effectively applying statistical and computing techniques. Assistance is offered to UT students, faculty and staff, as well as other organizations and individuals. For students, the Technology Fee covers the cost of services for up to two hours per month (10 hours per semester). Beyond that, the fee provides a subsidized rate of $20 per hour. Faculty and staff are offered five hours per month of centrally-funded consulting. Consulting is provided on:

*SAS, SPSS, and JMP
*Research planning and design
*Sample size determination
*Data entry and management
*Access to outside data sources such as census, stock market, ICPSR
*Analysis and interpretation
*Statistical graphics
*Review of journal articles, grant proposals, theses or dissertations
*Computer programming (not centrally funded)
*Training in the use of statistical and computing techniques

DII WEBSITE AND DOCUMENTATION

The DII Website is located at http://www.DII.utk.edu. The DII Web page provides access to information about, and access to, the many DII technology services that are available. On-line and printed documents describe use of resources available to students, faculty and staff. This documentation includes The Life Preserver, a manual to help get started using the UNIX account and sending/receiving e-mail, quick reference guides, and frequently-asked-questions (FAQ) Web pages.

INNOVATIVE TECHNOLOGIES COLLABORATIVE

The Innovative Technologies Collaborative (ITC) enriches the educational experience of UT students by supporting the academic community in advancing learning through the use of instructional technologies. The ITC's services and resources are available to all UT faculty, academic teaching staff, and graduate teaching assistants. The ITC staff is available to consult with instructors on everything from developing technology-driven course components to offering fully online curricula. At the heart of the ITC is a team of highly skilled professionals. The group has expertise in instructional, multimedia, graphical interface, and Web design. They also have expertise in technology assessment and integration, computer programming, and information science.

Each semester, the ITC offers a comprehensive selection of courses and workshops (itc.utk.edu/itc/courses) to all members of the UT academic teaching staff. In addition to the hands-on approach used during instruction, online components are available for reference and practice.

In response to current trends in higher education to move instructional materials and courses onto the World Wide Web, the ITC hosts Blackboard's CourseInfo as the course campus management system. CourseInfo allows instructional staff to create, edit, and add course materials, organize content flow, communicate with students, manage grades and student materials, and facilitate the course either wholly online or in conjunction with a face-to-face course. This service not only makes publishing class materials on the Web easier, it is free and hosted by the ITC on a restricted server, protecting intellectual property and student privacy. The ITC maintains the Online@UTK Website (online.utk.edu) with links to UT courses with a Web presence and courses powered by CourseInfo and the Get Online@UTK Website (itc.utk.edu/getonline) for access to training and support for the CourseInfo initiative.

The ITC maintains a variety of hardware and software resources for instructional use (itc.utk.edu/itc/resources). The ITC Development Lab is a multi-platform computer laboratory equipped with updated peripherals, software, and resources for designing, developing, authoring, producing, and evaluating online courseware and multimedia prototypes. Faculty may reserve a station and work independently, or consult with one of the ITC staff. In addition to the lab, the ITC maintains a small inventory of equipment that faculty may checkout for instructional use.

The ITC works with Academic Affairs to prioritize needs and standardize and implement technology-enhanced upgrades and renovations for classrooms and labs. This initiative includes oversight for the installation and use of instructional technology as well as the establishment of policies for the use and maintenance of these facilities. Smart classroom information, equipment use, and training classes are available upon request (itc.utk.edu/itc/smclass/home.html).

The ITC also maintains the UT Homepage (www.utk.edu) as the Internet portal to the University of Tennesse. This site is an educational and information resource for current and prospective students, alumni, faculty, staff, and the general public. The site averages more than four million hits a month.

The Innovative Technologies Collaborative is located at 4th floor of Dunford Hall, 915 Volunteer Blvd., Tel: 865-974-9670, FAX: 865-974-2050. E-mail: itc@utk.edu, ITC Website: itc.utk.edu. Hours: 8 a.m. to 5 p.m., Monday through Friday, or by appointment.
Energy, Environment, and Resources Center
(Office of Research)
Jack N. Barkenbus, Executive Director

The Energy, Environment, and Resources Center, 600 Henley Street, Suite 311, was created in 1973 to encourage interdisciplinary research directed at solutions to problems related to energy and the environment. The Center involves faculty and students in research and public service projects, manages research and development projects that involve several disciplines, and assists government and industry in specific problems related to energy, environmental, resource, and technology policy issues. The Center has a close working relationship with the Joint Institute for Energy and Environment and Oak Ridge organizations. Sponsors include federal and state agencies, industry, and foundations.

Current research includes solid and hazardous waste management, information systems, environmental education, global environmental problems, and pollution prevention. The Center operates the Waste Management and Education Institute, the Center for Clean Products and Clean Technologies, the Water Resource Research Center, the Center for Geography and Environmental Education, and the System Development Institute. Current grants and contracts are approximately seven million dollars per year.

Institute of Agriculture
Jack H. Britt, Vice President

The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee's Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled to offer instruction in agriculture and the mechanical arts for the first time. Since 1869, agricultural programs at the University have been expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Thus the Institute of Agriculture has come to include the work of four main divisions: the Agricultural Experiment Station, Agricultural Extension Service, College of Agricultural Sciences and Natural Resources, and College of Veterinary Medicine.

AGRICULTURAL EXPERIMENT STATION
Don O. Richardson, Dean

The Agricultural Experiment Station was established by The University's Board of Trustees on June 8, 1882, five years before the passage of the Hatch Experiment Station Act by the U.S. Congress. The University was one of the first five institutions in the U.S. to establish an Agricultural Experiment Station. Since its beginning, the Station has given first attention to investigations of concern to the agriculture of Tennessee.

The objectives of the Tennessee Agricultural Experiment Station are the creation and utilization of new knowledge through research. Fundamental research is directed toward: (a) Understanding the basic science of the processes of plant and animal production through conversion into usable products and services; (b) Understanding the resource and market forces which affect the production, transfer, processing, and utilization of agricultural commodities and the resulting impact on the economic well-being of the agricultural sector, rural areas, and the State of Tennessee; (c) Understanding the interaction of agricultural production and land use on natural resources and the environment they relate to long-term productivity and affect the quality of rural life; (d) Understanding the impact of food and fiber resources and the chemicals used in their production on people's well-being and the quality of life. Applied research utilizes these understandings to formulate effective production and marketing systems and to foster the development of a physical and economic environment that provides for the needs of rural, farm, and urban citizens.

The investigations of the Station follow a systematic method of gaining and applying knowledge efficiently to the biological, physical, and economic phases of producing, processing, and distributing farm and forest products; to the social and economic aspects of rural living; and to consumer health and nutrition. Both farm and urban populations gain from the accomplishments of the Agricultural Experiment Station. Examples of some of these accomplishments are new and improved varieties of crops, new and better methods of controlling crop and livestock pests, more efficient production of crops and pasture through improved fertilization and mechanization, and more efficient feeding and management of livestock.

The program is designed and administered through ten subject matter departments located at Knoxville. A majority of the faculty have teaching responsibilities in addition to their research. To assist in the research program, the Station employs approximately 100 graduate students. To serve Tennessee's diverse agriculture, branch stations are operated at Crossville, Grand Junction, Greeneville, Jackson, Knoxville, Lewisburg, Martin, Milan, Oak Ridge (forestry), Springfield and Spring Hill. Professional and technical staff are in residence at these locations.

AGRICULTURAL EXTENSION SERVICE
Charles L. Norman, Dean

The Agricultural Extension Service was established in 1914. Its purpose is to extend through various educational means agricultural and home economics information to farm families and others in the state who do not have the opportunity to enroll in resident courses of instruction at colleges.

The educational program is carried on through offices in each of the 95 counties of the state. Educational emphasis includes work in four major program areas: agriculture and natural resources, community resource development, home economics, and education of young people through 4-H Clubs.

County Extension staff members working directly with local people are supported in the various information fields by a specialist staff, members of which are stationed either in Knoxville, Nashville, or Jackson.

The Agricultural Extension Service operates administratively as one of four units of the Institute of Agriculture. For administration, the state is divided into five districts with supervisors located in their respective districts. District headquarters are maintained in Knoxville, Chattanooga, Cookeville, Nashville, and Jackson.

The Agricultural Extension Service operates as a three-way partnership among county, state, and federal governments. The University of Tennessee represents state and federal government and a County Agricultural Extension Committee represents county government in this partnership.

Libraries, The University of Tennessee
Aubrey H. Mitchell, Associate Dean

Professors:
Bayne, Pauline S., M.S.L.S. Alabama
Britten, William A., M.S.L.S. Clarion
Crowther, Karmen N.T., M.Ln. Emory
Felde-Hohme, Felicia H., M.S.L.S. Atlanta
Lloyd, James B., Ph.D., Missippi
Miller, Tamara J., M.S.L.S. Kentucky
Phillips, Linda L., M.L.S. Rutgers
Rader, Joe C., M.S.L.S. Tennessee

Associate Professors:
Baker, Gayle D., M.L.S. Alabama
Bridges, Anne E., M.L.S. Rhode Island
Dixon, Lana, M.S.L.S. Tennessee
Garrett, Marie A., M.L.S. Vanderbilt
Harris, Steven, M.L.S. Arizona
Keally, Jillian M., M.S.L.S. Tennessee
Kim, Sook-Hyun, M.A.L.S. Indiana
Leach, Sandra S., M.Ln. Emory
Mack, Thura, M.S.L.S. Tennessee
Mitchell, Aubrey H., M.S.L.S. Tennessee
Prescod, Janette, M.L.S. Western Michigan
Row, Jane S., M.L.S. Tennessee
Sammataro, Linda, M.L.S., Southern Connecticut State
Shrode, Flora G., M.L.S. Texas
Thomson, Mark, M.L.S. Illinois
Thomas, Deborah L., M.S.L.S. George Peabody
Thompson, Steve, M.S.L.S. Tennessee
Wise, Deborah A., M.Ln. Washington

Assistant Professors:
Atkins, David P., M.A.L.I.S. Wisconsin
Berry, Teresa, M.S.L.S. Tennessee
Ellis, Kathryn D., M.S.L.S. North Carolina
Johnson, Kay G., M.L.S. Pittsburgh
Ratledge, David, M.S.L.S. Tennessee
Robertson, Michelle, M.L.S. North Carolina
Viera, Ann R., M.L.S. California, Berkeley
Weber, Mary Ellen, M.L.S. Kentucky

The University of Tennessee Libraries own approximately 2.1 million volumes and
Ave., Nashville) serves College of Social Sciences for use in the Reading Room.

Tennessee life. Materials from Special Collections are paged for library users from material documents University of Tennessee, University Archives are primary source materials and costly modern of the Hoskins Library) is a repository of and digital formats are acquired from the Hoskins Library, Cumberland Ave. & 15th St. are collected.

Most of the publicationsof the U.S. Department of Agriculture, Veterinary Medicine Library (Room C-113, Veterinary Teaching Hospital) has a strong collection in agriculture, veterinary, comparative and human medicine, and related biological sciences. Most of the publications of the U.S. Department of Agriculture and the State Agricultural Experiment Stations and Extension Services are collected.

The Map Library (Room 15, basement of the Hoskins Library, Cumberland Ave. & 15th St.) maintains and develops a collection of sheet maps, atlases, journals, and books related to cartography. Materials in print, film, and digital formats are acquired from commercial sources as well as the Government Depository program.

The Music Library (301 Music Bldg.) has a comprehensive collection of music and music literature, including books, scores, audio and video recordings, current periodicals, and microfilm. All materials in the Library of Congress "M" classification are located here. Special Collections (2nd floor; west wing of the Hoskins Library) is a repository of primary source materials and costly modern library materials. The University Archives are also housed here. The Archives contain official records of the University; items published officially and unofficially; and other materials that document University of Tennessee life. Materials from Special Collections are paged for library users from closed stacks for use in the Reading Room.

The Social Work Library (1720 West End Ave., Nashville) serves College of Social Work students in field practice across the state. The library has a working collection of materials in social work and related disciplines.

The Law Library on the Knoxville campus and the libraries located on the campuses in Chattanooga, Martin, Memphis, and Tullahoma are individually administered. Each library of The University of Tennessee is accessible to all students and faculty of the University.

*Data describe the Knoxville campus, excluding the Law Library.

**Maintenance and Reliability Center**

**College of Engineering**

Thomas V. Byerly, **Director**

The Maintenance and Reliability Center (MRC), located at East Stadium Hall, was created in 1996 to provide an international center for research, development and application of advanced maintenance and reliability engineering. Over 25 industrial firms and a network of universities and national laboratories have joined with UT in this endeavor. The four-fold mission of the MRC consists of education, research and technology assessment, information sharing, and business support and alliances. The mission has established maintenance and reliability engineering as an interdisciplinary activity with application across a broad spectrum of industrial activities. The MRC stresses the development of management techniques that will provide industry with the means to assess the availability, costs and benefits of advanced maintenance engineering practices.

The MRC involves all departments in the College of Engineering. Interested and qualified students may affiliate as interns with the MRC program while pursuing a degree in any of the engineering departments. Maintenance and reliability engineering courses are available. Research opportunities and graduate assistantships are also available for qualified students.

**Measurement and Control Engineering Center**

**College of Engineering**

Arlene Garrison, **Director**

The Measurement and Control Engineering Center, 512 East Stadium Hall, is sponsored by the College of Engineering, the Oak Ridge National Laboratory, and the National Science Foundation. The Center's program combines education, research, and technology transfer. Graduate assistantships are available for qualified students. The research is funded by major U.S. industrial companies and focuses on theoretical and practical developments in measurement and control, concentrating on areas that will significantly improve the productivity, reliability, and safety of industrial systems and processes.

Center research is carried out in the fields of process control, signal and image processing, and sensor development. Research in process control concentrates in the areas of process analysis, process modeling, control system design, and real-time expert systems. Fiber optic sensor systems development is underway for monitoring and control of chemical processes.

**Nutrition Institute**

**College of Human Ecology**

Michael B. Zemel, **Director**

Thomas C. Namey, Associate **Director**

The Nutrition Institute is a system wide, multidisciplinary consortium of faculty who are engaged in clinical and experimental nutrition research, teaching and service. Its expertise and resources are multifaceted including tools and techniques used in cell biology, epidemiology, metabolism and clinical training.

The multidisciplinary nature of nutrition has created a situation where nutrition research and teaching is dispersed among a number of academic units, including the Department of Nutrition in the College of Human Ecology as well as in several departments in the colleges of Agricultural Sciences and Natural Resources, Arts and Sciences, Medicine, and Veterinary Medicine. The Institute provides a communication link among all efforts in nutrition sciences, coordinates collaborative research programs in nutrition and provides a unified forum for exchange and interactions with the national and international nutrition community. In addition, by creating formal ties among the units within the University that are involved in undergraduate, graduate and professional education in nutrition, teaching resources may be pooled to strengthen nutrition-related instruction in these units.

The Institute publishes an on-line magazine Nutrition Uncovered which addresses current issues and controversies in the field. It may be found on the Web at http://nutrinst.he.utk.edu/.

**Off-Campus Graduate Centers**

**KINGSPORT GRADUATE PROGRAM**

UT offers graduate programs in Human Resource Development at the master's level.

Students who enroll in these programs must be admitted to The Graduate School of UT. Information and application forms may be obtained from the ETSU/UT at Kingsport, 1501 University Boulevard, Kingsport, Tennessee 37660.

**OAK RIDGE GRADUATE PROGRAM**

UT offers graduate programs at Oak Ridge leading to the master's degree in several engineering and related technical areas. Students can earn a master's degree in Chemical Engineering, Environmental Engineering (concentrations in mixed waste management, environmental risk assessment), Industrial Engineering (engineering...
CHATTANOOGA EDUCATION PROGRAM

UT offers a graduate program in education leading to the Doctor of Education degree with a major in Education, interdisciplinary concentration in leadership for teaching and learning.

For complete information concerning the programs, see Social Work under Fields of Instruction.

Psychological Clinic

(College of Arts and Sciences)

Leonard Handler, Director

The Psychological Clinic supports graduate research and training in clinical psychology. Psychological assessment and psychotherapy are offered on an outpatient basis to the general public as well as to University students and staff.

Research Consortiums

The University of Tennessee is a member of three not-for-profit research consortiums: Oak Ridge Associated Universities (ORAU); Southeastern Universities Research Association (SURA); and Universities Research Association, Inc. (URA).

1. ORAU is a nonprofit consortium of colleges and universities and a management operating contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep their members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among their members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU manages, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, pharmacology, ocean science, biomedical science, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of under represented minority students pursuing degrees in science and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the Resource Guide which is available by calling the contacts below.

ORAU's Office of Higher Education Initiatives (HEI) seeks opportunities for collaborative research and development alliances among its members, private industry, and major federal facilities. HEI sponsors the Visiting Industrial Scholars program and the Junior Faculty Enhancement Awards.

2. SURA is a nonprofit consortium of 41 universities in thirteen Southeastern states and the District of Columbia. SURA's goals are to foster excellence in scientific research, to strengthen the scientific and technical capabilities of the nation and the Southeast, and to provide outstanding training opportunities for the next generation of scientists and engineers. The SURA-Oak Ridge National Laboratory (ORNL) Summer Cooperative Research Program in Materials Science and Engineering was established in 1989 to promote collaborations between individual university investigators and ORNL researchers. The SURA Continuous Electron Beam Accelerator Facility (CEBAF) Graduate Fellowship Program offers awards to promising graduate students enrolled or enrolling in master's or doctoral programs at SURA member institutions and whose research interests are consistent with research activities to be conducted at CEBAF (i.e., nuclear and related particle physics, accelerator physics, and associated scientific and engineering fields).

3. URA, Inc. is a nonprofit corporation consisting of 86 major research-oriented universities in the United States, Canada, and Japan and is a management operating contractor for the U.S. Department of Energy (DOE) for the design, construction, and operation of the Fermi National Accelerator Laboratory (Fermilab) located near Batavia, Illinois. URA provides funds to support courses for graduate students at Fermilab. Member institutions have graduate study programs in science and are active in particle physics and astrophysics.

For more information about ORAU and its programs, SURA, and URA, contact Dr. Michael D. Devine, Office of Research and ORAU Council member at 865-974-3466 or mdevine@utk.edu; or contact Monnie E. Champion, ORAU Corporate Secretary at 865-579-3306. Additional information may also be obtained at ORAU's World-Wide Web site at www.orau.gov and http://cebalat.gov/ura. For more information about SURA, contact Dr. Richard D. Veitch, Secretary and President, SURA, Inc. at 309-368-7800. Additional information may also be obtained at SURA's World-Wide Web site at http://www.sura.edu. For more information about URA, contact Dr. M. Andrew J. Sturgeon, President, URA, Inc. at 309-368-3880. Additional information may also be obtained at URA's World-Wide Web site at www.ura.gov.

Tourism Institute

(College of Human Ecology)

Nancy Fair, Director

The Tourism Institute at UT uses a systems approach to enhance economic development in Tennessee and the Southeast region. Founded in the Department of Consumer and Industry Services Management, the Institute integrates faculty expertise from the hotel and restaurant administration program, the recreation and tourism management program, and the retail and consumer sciences program to address emerging issues and needs. The Institute is also supported by the Graduate School of Planning and the College of Agricultural Sciences and Natural Resources.

Textiles and Nonwovens Development Center

(College of Human Ecology)

Billie J. Collier, Interim Director of Operations and Resources

Larry C. Wadsworth, Senior Executive for Marketing and Technology

The Textiles and Nonwovens Development Center (TANDEC) was officially dedicated in October 1990. TANDEC was made possible through a grant from Exxon Chemical Company. Nonwovens products loom large in a number of markets and TANDEC looms large in both basic research and nonwoven product development. Nonwovens research programs at UT include structure-property-process relationships in melt blowing, polyolefins, polyesters, nylon, elastomeric polymers, engineering thermoplastics and recycled plastics, mechanism of melt blown web formation, modeling of melt blowing and spunbonding processes, development of online optical measurements for control of the critical properties of melt blown webs, electrical measurement of fiber alignment and bonding in nonwoven webs; thermal bonding and characterization of cotton/synthetic fiber nonwovens; computational analysis of heat transfer behavior in thermal calendaring, study of protective apparel for agricultural, industrial and medical uses; and finishing of nonwovens. In addition to the basic research, technology transfer has been accomplished during the past several years by assisting companies in applied projects, primarily in the melt blowing area. Collaboration is ongoing with faculty in the College of Engineering.

The primary missions of TANDEC are to conduct nonwoven and textile grant research programs and to develop new product applications. The TANDEC facilities further allow production of nonwovens by industrial companies. The nonwovens laboratory hosts numerous guests from industry and academic, and the facilities are planned to meet their needs, while safeguarding research confidentiality.
Successful tourism requires attractions to draw tourists and support businesses that provide high quality food, lodging and related consumer goods and services. The mission is to deliver research, development, and training projects that will promote sustainable tourism in Tennessee and the Southeast Region. The Space Institute pursues research studies to better understand the needs of the state’s and region’s tourist customers to enable the industry to provide the goods and services that will increase and diversify the tourist base. It works with agencies and businesses to develop strategies for creating and expanding tourism enterprises. It also provides management level personnel to the tourism industry through the degree programs in the department and assists the industry in workforce training.

University of Tennessee Space Institute

T. Dwayne McCay, Senior Vice President for Research and Information Technology

The Space Institute is a graduate education and research institution located on a 365 acre lakeshore campus in Middle Tennessee. UTSI was established in 1964 and has evolved into an internationally recognized institution for graduate study and research in engineering, physics, mathematics, and computer science. The accredited academic programs and educational policies of the Space Institute have their origins in appropriate departments of The University of Tennessee. The more than 40 faculty members of the Institute carry out these accredited academic programs through classroom teaching, informal seminars, active research, and directing the research of their students in an environment of creative work and advanced study. Programs are available to students devoting full-time or part-time effort toward M.S. and Ph.D. degrees, those interested in continuing education for updating and broadening knowledge, and those who wish to pursue post-doctoral research.

Graduate degree programs are available with majors in Aerospace Engineering, Aviation Systems, Chemical Engineering, Computer Science, Electrical Engineering, Engineering Science, Industrial Engineering (engineering management concentration), Mathematics, Mechanical Engineering, Metallurgical Engineering, and Physics. In addition to the fundamental studies characteristic of each discipline, research opportunities are available in many areas including aerodynamics, fluid mechanics, advanced space propulsion, nuclear networks, energy conversion processes, superconducting materials, thermal sciences, coal combustion, magneto-hydrodynamics, plasma physics, space systems, propulsion, computational fluid dynamics, and other aspects of atmospheric and space flight.

The Institute has an established Center of Excellence in Laser Applications and offers graduate studies and research opportunities in laser diagnostics, laser materials interactions, pico-second processes, and coherent and non-linear optics.

The Institute was established in part to increase the research and educational resources of Tennessee through education and practice in relevant scientific and technical areas and in part to interface University faculty and student research with the Air Force Arnold Engineering Development Center. The faculty, research activities, and facilities of the Institute, and those available at Arnold Center through appropriate contractual arrangements, provide students an unusual opportunity for significant research in these areas. Students who enroll at UTSI are admitted to The Graduate School, The University of Tennessee. Graduate Research Assistantships are available for qualified students. Further information may be obtained from the Dean for Academic Affairs, The University of Tennessee Space Institute, Tullahoma, Tennessee 37368.

University Outreach and Continuing Education

Robert Leeter, Dean
Norvel L. Burkett, Associate Dean of Non-Credit Programs
John Muldowmy, Associate Dean of Credit Programs
Robert Jackson, Assistant Dean for Technology and Development
M.K. Warden, Assistant Dean for Credit Programs

The University of Tennessee is committed to its land-grant mission of public service. The institution meets that mission by extending its continuing education services and programming resources through outreach initiatives. University Outreach and Continuing Education works with UT academic units to offer courses, educational services and programs to students, teachers and faculty. The division offers programming using a variety of modes, helping people of all ages achieve degrees and certificates, accomplish professional development goals, and pursue recreational and intellectual interests.

Programs and courses are based upon student needs and desires, whether for self-motivated learning; for leisure and recreational programs; or for professional promotion, certification, licensure, relicensure, or mid-career changes. The Division provides these opportunities through program coordination and development of the six departments: Department of Conferences, Department of Distance Education and Independent Study, English Language Institute, University Evening School, Summer School and Special Programs, and UT Professional and Personal Development.

For more information, contact: University Outreach and Continuing Education, 1534 White Avenue, Knoxville, TN 37996-1526, Phone: (865) 974-9181, FAX: (865) 974-6269, E-mail: outreach@utk.edu, Website: www.outreach.utk.edu.

DEPARTMENT OF CONFERENCES

Norvel Burkett, Associate Dean and Director
Robert Gibbs, Assistant Director
UT Conferences, housed in the Conference Center Building in downtown Knoxville, provides management services to UT departments and faculty or outside groups that desire to hold a high quality conference or meeting anywhere in Tennessee or across the United States.

UT Conferences assists organizations in designing and managing programs to meet the needs of meeting attendees. The staff provides professional guidance and management for small group meetings as well as for major conventions of several thousand delegates. Consulting and support services can include planning and budgeting, lodging, food services, speakers, promotional materials, meeting-site management and all details to ensure a successful event. Some programs qualify for Continuing Education Units (CEUs), which become a permanent record maintained by the Division.

Professional groups and interested individuals can request interactive videoconferencing to locations worldwide. Arrangements can also be made to receive (downlink) programming or transmit (uplink) programming via satellite.

Additional information may be obtained from: UT Conferences, P.O. Box 3646, Knoxville, TN 37901, Phone: (865) 974-0250, FAX: (865) 974-0264, E-mail: conferences@utk.edu, Website: www.outreach.utk.edu/conferences.

ENGLISH LANGUAGE INSTITUTE

Dale A. Myers, Director
Jan G. Hill, Assistant Director

The English Language Institute (ELI) offers a non-credit language-study program. It is designed to assist students in their pursuit of career goals or educational objectives in the United States. The courses emphasize development of communicative ability in listening, speaking, reading, and writing. Faculty members are trained in teaching English to speakers of other languages and different national backgrounds, with varying proficiency in English. The curriculum consists of eight proficiency levels: 101-108, Introductory through Pre-Academic.

Classes meet 3-5 periods each day with emphasis on English Structure (Grammar); Listening Comprehension, Writing/Composition (Rhetoric); Conversation Practice for Communicative Purposes, Reading and Vocabulary.

Classes also assist students in pronunciation, test-taking strategies, U.S. culture orientation, and university study skills.

Additional information may be obtained from: English Language Institute, 307 Mountcastle Street, Knoxville, Tennessee 37996-3505, Phone: (865) 974-3404, FAX: (865) 974-6383, E-mail: eli@utk.edu, Website: www.outreach.utk.edu/ELI.

UT PROFESSIONAL AND PERSONAL DEVELOPMENT

Norvel Burkett, Acting Director
Nissa Dahlin-Brown, Assistant Director

UT Professional and Personal Development provides a comprehensive array of non-credit courses, certificates, and
seminars designed to serve the needs of individuals and businesses in Knoxville and surrounding communities. Courses are offered on the University campus, at off-campus locations, and on-line. They are taught by University faculty, staff, and community experts. Courses are also delivered "on-site" for business clients, with instructional services tailored to the needs of each group.

Business topics include professional development, career planning, computer training, and small business development. Personal interest topics range from business and computers to art, dance, gardening, music, and sports. There are also courses that meet requirements of the state or other agencies for certification in real estate and financial planning.

The department programs and manages the Internet eLearning Institute which provides certificate programs, professional development courses and training for information technology professionals or individuals seeking expertise in Internet technology. Courses are offered over the World Wide Web in the areas of e-Commerce, web databases, webmastering, network systems engineering, administrative technology, technical sales, and instructional technology.

Special programming also includes Kids U, providing summer hands-on workshops for elementary and secondary education students; Seniors for Creative Learning, a membership-based program focuses on issues and courses for senior adults; and the Smoky Mountain Field School a program co-sponsored with The Great Smoky Mountains National Park.

For further information or to register, contact: UT Professional & Personal Development, 105 Conference Center Bldg., Knoxville, TN 37996-4110, Phone: (865) 974-0150, FAX: (865) 974-0154, E-mail: ProfessionalPgms@utk.edu, Website: www.outreach.utk.edu/ppd.

DEPARTMENT OF DISTANCE EDUCATION AND INDEPENDENT STUDY
Robert Jackson, Assistant Dean and Director
The Department of Distance Education and Independent Study, in concert with academic departments at UT, offers interactive teleclasses for students at specially-equipped classrooms throughout Tennessee. Teleclass students participate actively with the instructor in Knoxville and students at other sites. Graduate courses in several disciplines are offered through this advanced technology. Video-taped and web-based courses are also available at a variety of sites in Tennessee and elsewhere to accommodate UT students pursuing advanced degrees at distant locations. The office also provides technical support services to the Division, its academic associates and clients, including information management, telecommunications, and media.

The department administers the program of independent study by correspondence for all campuses of the University. The program includes undergraduate college credit courses, high school courses (for credit or for college entrance requirements), and non-credit courses. College credit correspondence courses are based on regular UT campus courses, and the credit is recorded on the student's UT transcript. High school courses are based on the curriculum frameworks of the Tennessee Department of Education. Non-credit courses can be taken to meet personal or professional education goals. The courses use videotapes and audiotapes, as well as traditional print materials. The program is open to UT students and to anyone who has the educational preparation required for a particular course. UT students must have the approval of their college advising center before they enroll in college credit courses.

With the cooperation of a UT instructor, independent study through directed readings may also be arranged through this department for courses not listed in the Independent Study catalog (available online at: www.outreach.utk.edu/isis). The Internet eLearning Institute provides certificate programs, professional development courses and training for information technology professionals or individuals seeking expertise in Internet technology. Courses are offered over the world wide web in the areas of e-Commerce, web databases, webmastering, network systems engineering, administrative technology, technical sales, and instructional technology.

For information and registration forms, contact the Distance Education Program at: Distance Education and Independent Study, 1504 White Avenue, Knoxville, TN 37996-1525, Phone: (865) 974-9311 or (800) 325-8657, FAX: (865) 974-6629, E-mail: DistEducation@utk.edu, Website: www.outreach.utk.edu/isis.

UNIVERSITY EVENING SCHOOL
John Muldowny, Associate Dean and Director
M.K. Warden, Assistant Dean
The University Evening School administers on- and off-campus, undergraduate and graduate courses in a variety of traditional formats. All courses are approved and offered in conjunction with academic colleges and departments. Support services are provided to assist working adult students in their educational pursuits.

On-Campus Evening Program
Classes are offered during late afternoon and evening hours for those students who work or have other commitments during the day. The Master of Science degree is available with majors in Computer Science, Statistics, Communications, Management, Civil Engineering, Environmental Engineering, Human Resource Development, and Library Science. Also available are the Master of Public Administration and the Doctor of Education degrees.

Mini-Term
The University Evening School offers a Mini-Term during May. Students may enroll in one concentrated credit course during the Mini-Term period. Classes are offered in May and September.

Fee Waiver Program for Senior and/or Disabled Citizens
The Evening School administers this state-legislated program for UT Senior or totally disabled Tennessee citizens who wish to take UT credit courses may audit these free of charge or, upon application, may receive reduced credit. Specific information about the program may be obtained in the Evening School office.

For more information, contact: University Evening School, 451 Communications Bldg., Knoxville, TN 37996-0341, Phone: (865) 974-5361 or 1-800-676-8657, FAX: (865) 974-2027, E-mail: evening@utk.edu, Website: www.outreach.utk.edu/evening.

Off-Campus Programs
The Evening School conducts under- and graduate and graduate courses in a number of locations away from the Knoxville campus. All course offerings and instructor approval are approved by the appropriate academic departments and the credit awarded is resident credit. The M.S. with a major in Human Resource Development is available in Nashville. M.S. with a major in Education is available in Anderson and Hamblen Counties. The Ed.D. with a major in Education is available in Chattanooga. In Oak Ridge, the Evening School offers courses leading to advanced degrees in Environmental Engineering (with a concentration in Waste and Mixed Waste Management), Nuclear Engineering (with a concentration in Radiological Engineering), Chemical Engineering, and Safety Education.

Workshops
Credit workshops are coordinated through various academic departments of the University and give students the opportunity to participate in short periods of intensive study. Workshops offer flexibility of timing, location and content. Summer workshops are particularly popular with teachers and school administrators. Although most workshops are held on the University's Knoxville campus, location is not a limiting factor.

Student Services
A comprehensive program of services, including academic advising and financial aid information, is provided by the University Evening School for both on- and off-campus students.

Registration: Priority registration by touchtone phone, mail, FAX, or regular phone is offered as a convenience to current Evening School students. Final registration at both on- and off-campus locations is available by phone or in person.

Fee Payment: The Evening School functions as a Bursar's office. Fees may be paid in person, by mail or by phone (with a credit card).

Advising: Advising is available for the benefit of all Evening School students who need assistance with academic or related matters. The program can accommodate students during regular daytime hours and in the evenings by appointment, as well as at several centralized off-campus locations. The Colleges of Arts and Sciences, Business Administration, Communications, Education and Engineering cooperate with the Evening School to provide advising appointments after work hours.

For more information, contact: University Evening School, 451 Communications Bldg., Knoxville, TN 37996-0341, Phone: (865) 974-5361 or 1-800-676-8657, FAX: (865) 974-2027, E-mail: evening@utk.edu, Website: www.outreach.utk.edu/evening.
SUMMER SCHOOL AND SPECIAL PROGRAMS
John Muldowny, Associate Dean and Director

Summer School
The Summer School offers a wide range of educational opportunities to regular students of the University of Tennessee and to visiting students. More than 1,000 different summer courses are offered by the School of Information Sciences, and departments in the Colleges of Agricultural Sciences and Natural Resources, Architecture and Design, Arts and Sciences, Business Administration, Communications, Education, Engineering, Human Ecology, Law, Nursing, and Social Work.

One full term of ten weeks and two five-week sessions are offered during the summer. The principal mission of the Summer School is to enhance the academic program for undergraduate and graduate students, attract students from other colleges to the Knoxville campus, and utilize the cultural and natural attractions of the area to further enrich students' summer experience.

The summer faculty is composed largely of regular University faculty. In addition, some well-qualified visiting faculty members may be invited to teach each session.

To obtain more information about UT Summer School or Special Programs, contact: Summer School and Special Programs, 451 Communications Bldg., Knoxville, TN 37996-0349, Phone: (865) 974-5351 or 1-800-676-8657, FAX: (865) 974-2027, E-mail: summer@utk.edu, Website: www.outreach.utk.edu/summerschool.

Special Programs
The University of Tennessee offers a number of special programs on its Knoxville campus. Many of Special Programs' activities concentrate on ongoing outreach programs to K-12 teachers and students.

Southern Appalachian Science and Engineering Fair: The Fair brings between 300 and 400 students from East Tennessee middle and high schools where projects have been chosen to compete at the regional level. The event lasts 3-4 days, with judging occupying one afternoon and evening. Projects are displayed for public viewing after the competition until the awards convocation. Senior grand prize winners advance to international competition.

Tennessee Governor's School for the Sciences: The annual Governor's School brings between 130 and 150 high school students from Tennessee to the campus for a four-week residential program that emphasizes skill development in writing, computer use and analytical thinking skills. The school also provides the opportunity for students to spend half of their time in a choice of seven programs with focused topics in contemporary science, engineering and mathematics.

East Tennessee Academic Decathlon: This event brings high school teams of nine students and their coach(es) to campus for a day of competitive test taking. Approximately ten teams register and pay an annual entry fee for the privilege of competing for medals and trophies.

Tennessee Science Olympiad: Having won regional competitions, approximately 270 middle and high school students and their coaches from around the state participate in this event. The day-long competition involves approximately 25 events in each of the two school levels. Some events require intellectual performance in timed competitions, while other events require that a contrivance, prepared in advance or during the competition, be made to perform to standards which are not announced until competition time.

The Academy for Teachers of Science and Mathematics: This annual event brings teachers and school administrators to the Knoxville campus. Teachers participate in a 4-week residential program, and administrators attend a 3-day workshop. Emphasis is placed on the exploration of the experiential nature of ideas in science and mathematics and the profound interdependence of these two fields of human endeavor. The goal is to teach new, exciting ways of presenting mathematics and science. In addition, the alumni are networked through the Internet and via annual meetings. Operating since 1991, the Academy presently has approximately 750 alumni in 19 states and eastern Canada.

Directory of Special Programs: Each year, the Special Programs office compiles a directory containing as many programs as can be identified on the University's Knoxville campus that may be of interest to K-12 teachers and students.

For a directory or additional information on Special Programs contact: Special Programs, 210 Hoskins Library, Knoxville, TN 37996-4012, Phone: (865) 974-3354.

Water Resources Research Center
(Office of Research)

Timothy R. Gangaware, Associate Director

The Water Resources Research Center, 600 Henley Street, Suite 311, is a federally designated institute for sponsoring and coordinating water research for the state. The purposes of the Center are: (1) to assist and support all the academic institutions of the state, public and private, in pursuing water resources research which addresses a wide range of problems of interest to the state, region, and nation; (2) to provide for information dissemination and technology transfer services to state and local government bodies, academic institutions, professional groups, environmental organizations, and others, including the general public, who have an interest in water resources matters; (3) to promote education and training in fields relating to water resources and to encourage the entry of promising students into careers in these fields. The Center maintains a technical library which includes numerous water resources-related databases on CD-ROM.
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