The Graduate Catalog

The Graduate Catalog represents the offerings and requirements in effect at the time of publication, but there is no guarantee that they will not be changed or revoked. The course offerings and requirements of the institution are continually under examination and revision. However, adequate and reasonable notice will be given to students affected by any change. This catalog is not intended to state contractual terms and should not be regarded as a contract between the student and the institution.

Student Responsibility

Graduate students must assume full responsibility for knowledge of rules and regulations of the Graduate Council and departmental requirements for the chosen degree program. Any exceptions to the policies stated in the Graduate Catalog must be approved by the Dean of Graduate Studies. Individual colleges and departments may have requirements beyond the minimum established by the Graduate Council. A calendar of deadlines, policies and procedures for graduate programs are found on the Graduate Studies web page (http://web.utk.edu/~gsinfo). A statement of graduate students' rights and responsibilities is included with the admission notification. Additional copies are available at the Office of Graduate Admissions.

Contacts

(See Web Pages at http://www.utk.edu/ and at http://web.utk.edu/~gsinfo)

The University of Tennessee
Knoxville, TN 37996
Office Hours: 8:00 a.m.-5:00 p.m.
Monday-Friday

GRADUATE STUDIES
Anne Mayhew, Dean of Graduate Studies
Andy Holt Tower
(865) 974-3265 E-Mail: amayhew@utk.edu

GRADUATE STUDENT SERVICES
Kay Reed, Assistant to the Dean
440 Communications Building
(865) 974-2475 E-Mail: kreed@utk.edu

GRADUATE AND INTERNATIONAL ADMISSIONS
Rose Ann Trantham, Associate Director
218 Student Services Building
(865) 974-3251 E-Mail: rtrantha@utk.edu

FINANCIAL ASSISTANCE
Assistantships--Head of department or program in which you plan to major
Fellowships and Scholarships--Kay Reed, Assistant to the Dean
440 Communications Building
(865) 974-2475 E-Mail: kreed@utk.edu
Loans, Work-Study--Jeffrey Gerkin, Director
Scholarships and Financial Aid
115 Student Services Building
(865) 974-3131 E-Mail: jgerkin@utk.edu

CENTER FOR INTERNATIONAL EDUCATION
Jim Gehlhar, Director
1620 Melrose
(865) 974-3177 E-Mail: gehlhar@utk.edu

UNIVERSITY EVENING SCHOOL
Kathy Warden, Assistant Dean
451 Communications Bldg.
(865) 974-5361 E-Mail: mwarden@utk.edu

UNIVERSITY HOUSING
James Grubb, Executive Director
405 Student Services Building
(865) 974-2571 E-Mail: jgrubb1@utk.edu

DISABILITY SERVICES
Dan Carlson, Director
191 Hoskins Library
(865) 974-6087 E-Mail: carlson@tennessee.edu

REGISTRAR
Monique Anderson, Registrar
209 Student Services Building
(865) 974-2101 E-Mail: manders3@utk.edu

GRADUATE STUDENT ASSOCIATION
GSA President
315E University Center
(865) 974-2377 E-Mail: gsa@utk.edu
## University Calendar for 2002-03

### Summer Term 2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 30 (Thursday)</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>July 3 (Wednesday)</td>
<td>First Session Ends</td>
</tr>
<tr>
<td>July 4 (Thursday)</td>
<td>Independence Day</td>
</tr>
<tr>
<td>July 5 (Friday)</td>
<td>Second Session Begins</td>
</tr>
<tr>
<td>August 7 (Wednesday)</td>
<td>Second Session Ends</td>
</tr>
<tr>
<td>August 10 (Saturday)</td>
<td>Graduation Date*</td>
</tr>
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### Fall Semester 2002

<table>
<thead>
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<th>Date</th>
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<tbody>
<tr>
<td>August 21 (Wednesday)</td>
<td>Classes Begin</td>
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<tr>
<td>September 2 (Monday)</td>
<td>Labor Day</td>
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<tr>
<td>October 10-11 (Tuesday-Friday)</td>
<td>Fall Break</td>
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<tr>
<td>November 28-29 (Thursday-Friday)</td>
<td>Thanksgiving Break</td>
</tr>
<tr>
<td>December 3 (Tuesday)</td>
<td>Classes End</td>
</tr>
<tr>
<td>December 4, 6 (Wednesday, Friday)</td>
<td>Study Period</td>
</tr>
<tr>
<td>December 5, 9-12 (Thursday, Monday-Thursday)</td>
<td>Final Exams</td>
</tr>
<tr>
<td>December 13 (Friday)</td>
<td>Commencement</td>
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### Spring Semester 2003

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>January 13 (Monday)</td>
<td>Classes Begin</td>
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<tr>
<td>January 20 (Monday)</td>
<td>Martin Luther King Holiday</td>
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<tr>
<td>March 17-21 (Monday-Friday)</td>
<td>Spring Break</td>
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<td>April 18 (Friday)</td>
<td>Spring Recess</td>
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<td>May 1-2 (Thursday-Friday)</td>
<td>Final Exams</td>
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<td>May 5-9 (Monday-Friday)</td>
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<tr>
<td>May 10 (Saturday)</td>
<td>Mini-Term</td>
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<tr>
<td>May 14-June 4 (Wednesday-Wednesday)</td>
<td>Memorial Day</td>
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### Summer Term 2003

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<td>June 5 (Thursday)</td>
<td>Classes Begin</td>
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<tr>
<td>July 4 (Friday)</td>
<td>Independence Day</td>
</tr>
<tr>
<td>July 9 (Wednesday)</td>
<td>First Session Ends</td>
</tr>
<tr>
<td>July 10 (Thursday)</td>
<td>Second Session Begins</td>
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<tr>
<td>August 12 (Tuesday)</td>
<td>Second Session Ends</td>
</tr>
<tr>
<td>August 16 (Saturday)</td>
<td>Graduation Date*</td>
</tr>
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</table>

*There is no commencement ceremony in the summer. This is the official date that will appear on the transcript.

**NOTE:** Deadlines for degree requirements are at end of section on Degree Program Requirements.
The University Administration

Board of Trustees

Ex Officio Members

Governor, State of Tennessee
Commissioner of Education
Commissioner of Agriculture
President of The University of Tennessee
Executive Director, Tennessee Higher Education Commission

TERM EXPIRES

From Weakley County
Barbara C. Castleman May 31, 2002
Student Member
Tiffany Smith June 30, 2002
Faculty Member
Verbie Prevost June 30, 2002

From Anderson, Bedford, Coffee, Franklin, Lincoln, Moore, and Warren Counties
J. Steven Ennis TERM EXPIRES May 31, 2006

From Davidson County
R. Clayton McWhorter May 31, 2005

From Hamilton County
Frank J. Kinser May 31, 2002

From Knox County
Susan Richardson-Williams May 31, 2007
James A. Haslam, II May 31, 2007

From Shelby County
Vacant May 31, 2002
Rhynerette N. Hurd May 31, 2002

TERM EXPIRES

From Congressional Districts
D. Lynn Johnson, Kingsport First May 31, 2005
William B. Stokely, III, Knoxville Second May 31, 2007
John C. Thornton, Chattanooga Third May 31, 2006
Charles E. Coffey, Shelbyville Fourth May 31, 2002
B. C. Clippard, Jr., Nashville Fifth May 31, 2003
Andrea Loughry, Murfreesboro Sixth May 31, 2005
Waymon L. Hickman, Columbia Seventh May 31, 2006
Jerry L. Jackson, Dyersburg Eighth May 31, 2002
Johnnie D. Amonette, Memphis Ninth May 31, 2007

University of Tennessee (Knoxville, Memphis, Tullahoma, Institute of Agriculture, Institute for Public Service) Administration

Emerson H. Fly, B.S., CPA, Acting President and Chief Executive Officer
Thomas B. Ballard, B.S., Vice President for Public and Governmental Relations
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Dwight L. Teeter, A.B., M.J., Ph.D., Dean of the College of Communications
C. Glennon Rowell, B.S., M.A., Ed.D., Dean of the College of Education
Fred Tompkins, B.S., Ph.D., Acting Dean of the College of Engineering
James D. Moran, III, B.A., M.S., Ph.D., Dean of the College of Human Ecology
Elizabeth S. Aversa, B.A., M.Ln., Ph.D., Director, School of Information Sciences
Thomas C. Galligan, Jr., A.B., J.D., L.L.M., Dean of the College of Law
Karen Sowers, B.A., M.S.W., Ph.D., Dean of the College of Social Work
Michael J. Blackwell, B.S., M.P.H., D.V.M., Dean of the College of Veterinary Medicine
Robert Leiter, B.S., M.S., Ed.D., Dean of University Outreach and Continuing Education
Barbara I. Dewey, B.A., M.A., Dean of University Libraries

TERM EXPIRES

Marleen K. Davis, B.Arch., M.Arch., Dean of the College of Architecture and Design
Robert Leiter, June 30, 2007
Jan R. Williams, June 30, 2007
Karen Sowers, June 30, 2007
Michael J. Blackwell, June 30, 2007
The Graduate Studies Administration

Anne Mayhew, B.A., Ph.D., Vice Provost for Academic Affairs and Dean of Graduate Studies
S. Kay Reed, B.S., M.S., M.A., Ph.D., Assistant to the Dean

The Graduate Council (Membership August 1, 2001)

Ex Officio Members

| Ex Officio Member | 
|-------------------|------------------------|
| Dr. Anne Mayhew, Graduate Council Chairman | Dr. Sarah Gardial, College of Business Administration |
| Dr. Mary Albrecht, College of Agricultural Sciences and Natural Resources | Dr. Thomas W. George, College of Education |
| Dr. Elizabeth Aversa, School of Information Sciences | Dr. Leon Potgieter, College of Veterinary Medicine |
| Dr. Bill Blass, Chairman of the Research Council | Dr. Stuart Rigsby, College of Arts and Sciences |
| Dr. John Caruthers, UT Space Institute | Dr. Carol Seavor, College of Nursing |
| Dr. Ed Caudill, College of Communications | Dr. John L. Sobieski, Jr., College of Law |
| Mr. Jon Coddington, College of Architecture and Planning | Dr. Fred Tompkins, College of Engineering |
| Dr. Billie Collier, College of Human Ecology | Dr. Kathy Warden, University Outreach and Continuing Education |
| Ms. Barbara Dewey, Dean of Libraries | 
| Dr. David Dupper, College of Social Work | 

College or Unit | Elected Members | Expiration | Proxy |
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<td>July 31, 2004</td>
<td>Dr. David A. Golden</td>
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<td>Architecture &amp; Design</td>
<td>Mr. Jon Coddington</td>
<td>July 31, 2004</td>
<td>Mr. Max Robinson</td>
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<td>Arts &amp; Sciences</td>
<td>Dr. Mike Lofaro</td>
<td>July 31, 2002</td>
<td>Dr. Joel Lubar</td>
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<td>Dr. Tom Hood</td>
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<td>Dr. Steffi Ohnesorg</td>
<td>July 31, 2003</td>
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<td>Dr. Carol Harden</td>
<td>July 31, 2003</td>
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<td>Dr. Beauvais Lyons</td>
<td>July 31, 2003</td>
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<td>Dr. Stephen Blackwell</td>
<td>July 31, 2004</td>
<td>Dr. John Romeiser</td>
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<td>Dr. Charles Feigerle</td>
<td>July 31, 2004</td>
<td>Dr. Gerald Schroedl</td>
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<td>Business Administration</td>
<td>Dr. Ray DeGennaro</td>
<td>July 31, 2002</td>
<td>Dr. Dan Murphy</td>
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<td>Dr. Melissa Bowers</td>
<td>July 31, 2003</td>
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<td>Dr. Richard Townsend</td>
<td>July 31, 2003</td>
<td>TBD</td>
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<tr>
<td>Communications</td>
<td>Dr. Barbara Moore</td>
<td>July 31, 2002</td>
<td>Dr. Ed Caudill</td>
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<tr>
<td>Education</td>
<td>Dr. Sharon Judge</td>
<td>July 31, 2002</td>
<td>Dr. David Bassett</td>
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<td>Dr. Dennie Kelley</td>
<td>July 31, 2002</td>
<td>Dr. Grady Bogue</td>
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<td>Dr. Vena Long</td>
<td>July 31, 2003</td>
<td>Dr. Mary Jane Connelly</td>
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<td>Dr. Kathleen Davis</td>
<td>July 31, 2004</td>
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<td>Dr. Blanche O'Bannon</td>
<td>July 31, 2004</td>
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<tr>
<td>Engineering</td>
<td>Dr. Wayne T. Davis</td>
<td>July 31, 2003</td>
<td>Dr. Arun Chatterjee</td>
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<td>Dr. Paul D. Frymier</td>
<td>July 31, 2004</td>
<td>Dr. Raymond Buchanan</td>
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<td>Dr. Majid Keyhani</td>
<td>July 31, 2004</td>
<td>Dr. Belle Upadhyaya</td>
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<tr>
<td>Graduate Student Association</td>
<td>Mr. Nathan Hammer</td>
<td>April 30, 2002</td>
<td>TBD</td>
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<td></td>
<td>Ms. Stacy Clement</td>
<td>April 30, 2002</td>
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<td>Mr. Sam Morton</td>
<td>April 30, 2002</td>
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<td>Human Ecology</td>
<td>Dr. Charles Hamilton</td>
<td>July 31, 2002</td>
<td>Dr. Randy Bresee</td>
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<td>Dr. Naima M. Moussa</td>
<td>July 31, 2004</td>
<td>Dr. Doo Lim</td>
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<tr>
<td>Law</td>
<td>Ms. D. Cheryn Picquet</td>
<td>July 31, 2003</td>
<td>TBD</td>
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<td>Nursing</td>
<td>Dr. Nan Gaylord</td>
<td>July 31, 2004</td>
<td>Dr. Sandra McGuire</td>
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<td>School of Information Sciences</td>
<td>Dr. Gretchen Whitney</td>
<td>July 31, 2003</td>
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<td>Social Work</td>
<td>Dr. Mary Rogge</td>
<td>July 31, 2004</td>
<td>Dr. John Orme</td>
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<td>Dr. Marlys Staudt</td>
<td>July 31, 2004</td>
<td>Dr. Roger Nooe</td>
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<td>UT Space Institute</td>
<td>Dr. Trevor Moulden</td>
<td>July 31, 2004</td>
<td>Dr. Monty Smith</td>
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<tr>
<td>Veterinary Medicine</td>
<td>Dr. Patti Tithof</td>
<td>July 31, 2003</td>
<td>Dr. John New</td>
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GRADUATE STUDY
Graduate Studies

The University of Tennessee is the land-grant institution of the State of Tennessee, with its main campus in Knoxville. UT is the state’s largest and most comprehensive institution, and is a Carnegie One Research Extensive Institution. 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, 2 professional programs, and several graduate certificate programs. More than 6,000 graduate and professional students are enrolled on and off campus under the tutelage of 1,500 faculty members.

Graduate programs bring 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.

Graduate programs are administered by the Graduate Council; the Graduate Studies administrative organization, composed of the Dean’s Office and the Office of Graduate Student Services; administrators of the various graduate programs; the 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 of Graduate Studies, 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, professional development, and the Graduate Deans Group.

The Office of Graduate Student Services, in conjunction with Admissions and Records, develops procedures to implement policies formulated by the Council. 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, upon recommendation of the academic unit, and who are currently enrolled in graduate programs.

Graduate education has been conducted at The University of Tennessee since 1821. The first 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 9,100 doctoral degrees and 54,000 master’s degrees have been awarded to date.
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.

### College of Agricultural Sciences & Natural Resources

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING FORM</th>
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<th>THESIS REQ.</th>
<th>LANGUAGE REQ.</th>
<th>CONCENTRATIONS AVAILABLE/</th>
<th>EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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<td>Agricultural &amp; Extension Education*</td>
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<td>Agricultural Economics*</td>
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<td>Animal Science*</td>
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<td>Biosystems Engineering*</td>
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<td>Biosystems Engineering Technology*</td>
<td>MS</td>
<td>Gc</td>
<td>3</td>
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<td>(974-7266, <a href="mailto:abed@utk.edu">abed@utk.edu</a>)</td>
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<tr>
<td>Entomology &amp; Plant Pathology*</td>
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<td>G</td>
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<td>Forestry*</td>
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<td>(974-7126, <a href="mailto:ghopper@utk.edu">ghopper@utk.edu</a>)</td>
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<tr>
<td>Natural Resources*</td>
<td>PHD</td>
<td>G</td>
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<td>Ornamental Horticulture &amp; Landscape Design*</td>
<td>MS</td>
<td>G</td>
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<td></td>
<td></td>
<td>Landscape design, public horticulture, turfgrass, woody ornamentals. (974-7324, <a href="mailto:auge@utk.edu">auge@utk.edu</a>)</td>
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<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. (974-8828, <a href="mailto:dreymond@utk.edu">dreymond@utk.edu</a>)</td>
<td></td>
</tr>
<tr>
<td>Wildlife &amp; Fisheries Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
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<td>(974-7126, <a href="mailto:ghopper@utk.edu">ghopper@utk.edu</a>)</td>
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### College of Architecture & Design

<table>
<thead>
<tr>
<th>MAJOR</th>
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<th>GRE</th>
<th>RATING FORM</th>
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<th>LANGUAGE REQ.</th>
<th>CONCENTRATIONS AVAILABLE/</th>
<th>EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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<tr>
<td>Architecture*</td>
<td>MArch</td>
<td>+</td>
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<td>3</td>
<td>X</td>
<td>X</td>
<td>First professional degree. Admit Summer and Fall only. Evaluate Feb 1. (974-5265, <a href="mailto:jcodeging@utk.edu">jcodeging@utk.edu</a>)</td>
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### College of Arts and Sciences

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<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING FORM</th>
<th>DEPT. REQ.¹</th>
<th>THESIS REQ.</th>
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<th>EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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<td>Anthropology</td>
<td>MA</td>
<td>+</td>
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<td>X</td>
<td>X</td>
<td>MA &amp; PHD-archaeology, biological anthropology, cultural anthropology, zooarchaeology. Admit Fall only. Evaluate Jan 15. (974-4408, <a href="mailto:dpalton@utk.edu">dpalton@utk.edu</a>)</td>
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<tr>
<td></td>
<td>PHD</td>
<td>+</td>
<td>G</td>
<td>3</td>
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<tr>
<td>Art*</td>
<td>MFA</td>
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<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td>Ceramics, drawing, graphic design, media arts, painting, printmaking, sculpture, watercolor, inter-area studies. Portfolio required. (974-3408, <a href="mailto:blyons@utk.edu">blyons@utk.edu</a>)</td>
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<tr>
<td>Audiology*</td>
<td>MA</td>
<td>+</td>
<td>G</td>
<td>2</td>
<td>X</td>
<td></td>
<td>Aural habilitation. Effective Fall 2003. AuD replaces MA. Admit Fall only. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
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<tr>
<td>Biochemistry and Cellular and Molecular Biology*</td>
<td>MS</td>
<td>+</td>
<td>G</td>
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<td>X</td>
<td>X</td>
<td>MS &amp; PHD-anatomy, histology, cytogenetics, cytology, ecology, genetics, lichenology, molecular biology, morphology, mycology, photosynthesis, physiology, plant pathology, systems biology. Evaluate for Fall Jan 7. (974-2255, <a href="mailto:bmu@utk.edu">bmu@utk.edu</a>)</td>
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<tr>
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<td>PHD</td>
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<td>Botany*</td>
<td>MS</td>
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<td>3</td>
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<td>MS &amp; PHD-anatomy, histology, cytogenetics, cytology, ecology, genetics, lichenology, molecular biology, morphology, mycology, photosynthesis, physiology, plant pathology, systems biology. Evaluate for Fall Jan 7. (974-2255, <a href="mailto:bmu@utk.edu">bmu@utk.edu</a>)</td>
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<td>Chemistry*</td>
<td>MS</td>
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<td>3</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, physical chemistry, polymer chemistry. PHD only-chemical physics (in cooperation with Physics Department), theoretical chemistry. (974-3141, <a href="mailto:clee@utk.edu">clee@utk.edu</a>)</td>
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<tr>
<td>Computer Science*</td>
<td>MS</td>
<td></td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td>(974-5067, <a href="mailto:straight@cs.utk.edu">straight@cs.utk.edu</a>)</td>
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<tr>
<td>Ecology and Evolutionary Biology*</td>
<td>MS</td>
<td></td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>MS &amp; PHD-behavior, ecology, evolutionary biology. Evaluate Jan 6. (974-3066, <a href="mailto:gmc@utk.edu">gmc@utk.edu</a>)</td>
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<td>English*</td>
<td>MA</td>
<td></td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>MA-writing. Degree-seeking students only. Admit Fall only. Evaluate Feb 15. (974-6933, <a href="mailto:paw@utk.edu">paw@utk.edu</a>)</td>
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<tr>
<td></td>
<td>PHD</td>
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<td></td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<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</td>
<td></td>
<td>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>MS</td>
<td></td>
<td>G</td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>Evaluate Feb 15. (974-6002, <a href="mailto:yoda@yoda.gg.utk.edu">yoda@yoda.gg.utk.edu</a>)</td>
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<tr>
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<td></td>
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<td>3</td>
<td>X</td>
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<td>See Modern Foreign Languages for PHD. (974-3421, <a href="mailto:hoey@utk.edu">hoey@utk.edu</a>)</td>
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</table>
History*  MA  G  PHD  G  3  X  X  X  PHD-american, european. Evaluate Feb 15.  
  (974-5421, tburman@utk.edu)

Life Sciences*  MS  G  PHD  G  3  X  X  X  MS & PHD-genome science and technology, plant physiology &
  genetics. Admit Fall only.  (974-1531, russellg@utk.edu)

Mathematics*  MM  MS  PHD  G  3  X  X  MS-applied mathematics. PHD-mathematical ecology.  
  (974-2464, gradprogram@math.utk.edu)

Microbiology*  MS  G  PHD  G  3  X  X  X  (974-3441, cvosding@utk.edu)

Modern Foreign Languages*  PHD  +  3  X  X  First concentration-French, German, Spanish. Second concentration-
  applied linguistics, French, German, Italian, Portuguese, Russian, 
  Spanish.  (974-3421, jromeise@utk.edu)

Music*  MM  2  X  Accompanying, choral conducting, composition, instrumental conducting, 
  jazz, music education, music theory, musicology, performance, piano, 
  pedagogy & literature. Audition required. (974-3331, canders@utk.edu)

Philosophy*  MA  +  G  3  PHD  +  G  3  X  X  MA & PHD-medical ethics, philosophy. MA only-religious studies. Admit 
  Fall only.  (974-3255, kbohsted@utk.edu)

Physics*  MS  G  PHD  G  3  X  X  MS & PHD-astrophysics; atomic, molecular, optical, & low temperature 
  physics; biophysics; chemical physics; condensed matter & surface 
  physics; elementary particle physics; mathematical & computational 
  physics; nuclear & relativistic heavy ion physics; theoretical physics. 
  MS only—geophysics, health physics. Rating forms required only for 
  consideration for teaching assistantships.  (974-3342, cshih@utk.edu)

Planning*  MSP  +  G  2  X  Environmental planning, land use planning, real estate development planning, 
  transportation planning. Admit Summer and Fall only. (974-5227, 
  cminkel@utk.edu)

Political Science*  MA  G  PHD  G  3  X  X  X  (974-2261, yzhong@utk.edu)

  PHD-clinical psychology, experimental psychology. Admit Fall only. 
  Evaluate Jan 15 and Feb 15.  (974-3326, cjogle@utk.edu)

Public Administration*  MPA  G  3  X  Dual JD-MPA program available. (974-2261, dfolz@utk.edu)

Sociology*  MA  +  G  3  PHD  +  G  3  X  X  MA & PHD-criminology; energy, environment & resource policy; political 
  economy. Admit Fall only. Evaluate Feb 15. (974-7023, 
  tomhood@utk.edu)

Spanish*  MA  3  X  X  See Modern Foreign Languages for PHD.  (974-7005, oriverar@utk.edu)

Speech & Hearing Science*  PHD  +  G  3  X  X  Audiology, hearing science, speech & language pathology, speech-
  language science.  (974-5019, kgross@utk.edu)

Speech Pathology*  MA  G  2  Aural habilitation. Admit Fall only.  (974-5019, kgross@utk.edu)

Theatre*  MFA  G  3  X  Costume design, performance, lighting design, scene design, theatre 
  technology. Audition required.  (974-6011, ldecuir@utk.edu)

College of Business Administration

Accounting*  MAcc  +  GMAT  2  X  Assurance services, systems, taxation. Admit Fall only. Evaluate Mar 1. 
  (974-1750, ftownsen@utk.edu)

Business Administration*  MBA  +  GMAT  2  X  MBA-finance, logistics & transportation, marketing, operations 
  management, PHD-accounting, finance, logistics & transportation, 
  management, marketing, statistics. Admit Fall only. Evaluate Mar 1. 
  Dual JD-MBA, MS-MBA, Executive MBA, Professional MBA 
  programs available.  (974-5033, mba@utk.edu)

Economics*  MA  G  PHD  G  3  X  X  GMAT may be substituted for GRE. Admit Fall only. Evaluate Feb 1. 
  (974-1697, dkemper@utk.edu)

Industrial & Organizational Psychology*  PHD  G  3  X  X  Admit Fall only. Evaluate Feb 1. Use forms obtained from department. 
  Degree-seeking students only.  (974-4843, jtrbov@utk.edu)

Management Science*  MS  G  PHD  G  3  X  X  GMAT may be substituted for GRE.  (974-4116, 
  jmoser@utk.edu)

Statistics*  MS  G  2  X  Industrial statistics. GMAT may be substituted for GRE. Certificate 
  program in applied statistical strategies also available.  (974-2556, 
  rmee@utk.edu)

College of Communications

Communications*  MS  G  3  X  MS & PHD-advertising, broadcasting, journalism, public relations, speech 
  communication. PHD only-information sciences. Admit Fall only.  
  (974-6651, colcomgs@utk.edu)

College of Education

College Student Personnel  MS  G  3  X  Evaluate Mar 15.  (974-6792, edadmin@utk.edu)
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<th>GRE</th>
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<th>LANGUAGE REQ'D.</th>
<th>CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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<tr>
<td>Counseling*</td>
<td>MS</td>
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<td>Gd</td>
<td>3</td>
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<td>Mental health counseling, rehabilitation counseling, school counseling. Evaluate Feb 1 and Nov 1. (974-6792, <a href="mailto:edadmin@utk.edu">edadmin@utk.edu</a>)</td>
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<tr>
<td>Education</td>
<td>MS</td>
<td>+</td>
<td>3</td>
<td>X</td>
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<td>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 &amp; comprehensive special education; reading education; science education; social foundations; social science education; special education; early childhood. MS Track 2 (those who are seeking initial licensure)-art education; education of the deaf &amp; hard of hearing; elementary teaching; modified &amp; comprehensive special education; secondary teaching; special education; early childhood. EDS-curruculum; educational administration &amp; supervision; elementary education; English education; foreign language/ESL education; instructional technology; mathematics education; reading education; school counseling; school psychology; science education; social science education, special education. EDD-curriculum, educational research, and evaluation; educational administration and policy studies; educational psychology; instructional technology; literacy; language education and ESL education; teacher education. PHD-counseling psychology; counselor education; cultural studies in education and special education; early childhood education; educational administration and policy studies; educational psychology; exercise science; instructional technology; literacy; language education and ESL education; school psychology; socio-cultural foundations of sport and education; teacher education. Evaluate Jan 1 and Feb 1. Certificate program in urban education also available. (974-6792, <a href="mailto:edadmin@utk.edu">edadmin@utk.edu</a>)</td>
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<tr>
<td>Educational Administration and Policy Studies*</td>
<td>MS</td>
<td>3</td>
<td>X</td>
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<td>Educational administration &amp; supervision. Evaluate Jun 1. (974-6792, <a href="mailto:edadmin@utk.edu">edadmin@utk.edu</a>)</td>
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<tr>
<td>Educational Psychology*</td>
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<td></td>
<td>Adult education, individual &amp; collaborative learning. (974-6792, <a href="mailto:edadmin@utk.edu">edadmin@utk.edu</a>)</td>
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<tr>
<td>Human Performance &amp; Sport Studies*</td>
<td>MS</td>
<td>+</td>
<td>3</td>
<td>X</td>
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<td>Exercise science, sport management, sport studies. (974-6792, <a href="mailto:gdills@utk.edu">gdills@utk.edu</a>)</td>
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### College of Engineering

#### Aerospace Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
- **PHD**
  - GRE: Gc
  - Rating Form: 3
  - X
  - X
  - MS & PHD-aeroacoustics, aerodynamics & performance, energy conversion & utilization, flight & aerospace mechanics, gasdynamics, heat transfer & fluid mechanics, propulsion, space engineering, structures & stress analysis, thermodynamics. (974-5115, maesinfo@engr.utk.edu)

#### Chemical Engineering*
- **MS**
  - GRE: G
  - Rating Form: 3
  - X
- **PHD**
  - GRE: G
  - Rating Form: 3
  - X
  - X
  - MS & PHD-advanced control systems, chemical bioengineering, chemical engineering, polymer science & engineering. Evaluate Feb 1 for financial aid. Qualified applicants are encouraged to apply directly to the PhD program. PhD applicants receive financial aid preference. Certificate program in maintenance and reliability engineering also available. (974-2421, cheinfo@utk.edu)

#### Civil Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
- **PHD**
  - GRE: Gc
  - Rating Form: 3
  - X
  - MS & PHD-construction engineering, environmental engineering, geotechnical/materials engineering, public works engineering, structural engineering, transportation engineering. (974-2503, cee@utk.edu)

#### Electrical Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
- **PHD**
  - GRE: G
  - Rating Form: 3
  - X
  - PHD: circuit theory, communication theory, computers, control systems, electro-optics, electromagnetic theory, plasma engineering, power electronics, power systems, solid-state electronics. (974-3461, ece@utk.edu)

#### Engineering Science
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
- **PHD**
  - GRE: Gc
  - Rating Form: 3
  - X
  - X
  - MS & PHD-biomedical engineering, computational mechanics, fluid mechanics, mechanics of composite materials, optical engineering (UTSI only), solid mechanics. MS only-advanced control systems, chemical bioengineering, chemical engineering, polymer science & engineering. Evaluate Feb 1 for financial aid. (Thesis required for full-time students receiving departmental financial aid.). Dual MS-MBA program available. See Engineering Science for PHD. Certificate program in maintenance and reliability engineering also available. (974-3333, ie@engr.utk.edu)

#### Environmental Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
  - Air quality, environmental risk assessment, mixed waste management, water quality, water resources. See Civil Engineering for PHD. (974-2503, cee@utk.edu)

#### Industrial Engineering*
- **MS**
  - GRE: G
  - Rating Form: 3
  - X
  - Industrial engineering, engineering management, manufacturing systems engineering, product development and manufacturing. Evaluate March 1 for financial aid. (Thesis required for full-time students receiving departmental financial aid.). Dual MS-MBA program available. See Engineering Science for PHD. Certificate program in maintenance and reliability engineering also available. (974-3333, ie@engr.utk.edu)

#### Materials Science and Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
  - MS & PHD-materials, metallurgy, polymers. (974-5336, prtaylor@utk.edu)

#### Mechanical Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
  - MS & PHD-dynamics, control & robotics; energy conversion & utilization; gasdynamics; heat transfer & fluid mechanics; machine design; power generation; propulsion; space engineering; stress analysis; thermodynamics. MS only-product development and manufacturing. Dual MS-MBA program available. Certificate program in maintenance and reliability engineering also available. (974-5115, maesinfo@engr.utk.edu)

#### Nuclear Engineering*
- **MS**
  - GRE: G
  - Rating Form: 3
  - X
  - Nuclear engineering. Certificate programs in maintenance and reliability engineering and in nuclear criticality safety also available. (974-2525, ute@utk.edu)

#### Polymer Engineering*
- **MS**
  - GRE: Gc
  - Rating Form: 3
  - X
  - MS & PHD-composite materials; mechanical, physical & chemical behavior of polymers; polymer morphology; rheology & polymer processing. (974-5336, prtaylor@utk.edu)
## College of Human Ecology

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<th>GRE</th>
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<th>DEPT. REQ.</th>
<th>THESIS REQ.D.</th>
<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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<tr>
<td>Child &amp; Family Studies*</td>
<td>MS G</td>
<td>3</td>
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<td>Child and family studies, early childhood education. Begin evaluation Feb 1. (974-5316, <a href="mailto:cfs@utk.edu">cfs@utk.edu</a>)</td>
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<td>Health Promotion &amp; Health Education</td>
<td>MS</td>
<td>3</td>
<td>X</td>
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<td>Evaluate Feb 1, April 1 and Oct 1. (974-5041, <a href="mailto:pcarney@utk.edu">pcarney@utk.edu</a>)</td>
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<tr>
<td>Human Ecology*</td>
<td>PHD + G</td>
<td>3</td>
<td>X X</td>
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<td></td>
<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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<tr>
<td>Human Resource Development</td>
<td>MS + G</td>
<td>3</td>
<td>X X</td>
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<td></td>
<td>Teacher licensure (Requires admission to teacher education), training and development. Evaluate Feb 1, Jun 1, and Nov 1. (974-2574, <a href="mailto:hrd@utk.edu">hrd@utk.edu</a>)</td>
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<td>Nutrition*</td>
<td>MS G</td>
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<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>Public Health*</td>
<td>MPH + G</td>
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<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. (974-6674, <a href="mailto:czbhamilton@utk.edu">czbhamilton@utk.edu</a>)</td>
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<tr>
<td>Recreation, Tourism, &amp; Hospitality Management</td>
<td>MS + G</td>
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<td>Hospitality management, recreation administration, therapeutic recreation, tourism. Evaluate Feb 1, Jun 1, Nov 1. Certificate program in services management also available. (974-2141, <a href="mailto:nbfair@utk.edu">nbfair@utk.edu</a>)</td>
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<td>Safety</td>
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<td></td>
<td></td>
<td>Emergency management, safety management. (974-5041, <a href="mailto:smsmith@utk.edu">smsmith@utk.edu</a>)</td>
</tr>
<tr>
<td>Textiles, Retailing &amp; Consumer Sciences*</td>
<td>MS G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<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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</tbody>
</table>

## College of Law

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING FORM</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ.D.</th>
<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
</tr>
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<tbody>
<tr>
<td>Law*</td>
<td>JD LSAT</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<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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## College of Nursing

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
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<th>DEPT. REQ.</th>
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<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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<tbody>
<tr>
<td>Nursing*</td>
<td>MSN + G</td>
<td>3</td>
<td>X</td>
<td></td>
<td>X X</td>
<td>MSN-adult health nursing, family nurse practitioner, mental health nursing, nurse anesthesia, nursing administration, nursing of women and children. Evaluate Oct 1 and Feb 1. For nurse anesthesia-Oct 1. Post-master's certificate in adult health nursing, family nurse practitioner, mental health nursing, nurse anesthesia, nursing administration, nursing of women and children also available. (MSN-974-7606, <a href="mailto:swebb1@utk.edu">swebb1@utk.edu</a>) (PHD-974-7581, <a href="mailto:sthomas@utk.edu">sthomas@utk.edu</a>)</td>
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</tbody>
</table>

## College of Social Work

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<tr>
<th>MAJOR</th>
<th>DEGREE</th>
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<th>RATING FORM</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ.D.</th>
<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Work*</td>
<td>MSSW + G</td>
<td>3</td>
<td>X</td>
<td></td>
<td>X X</td>
<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-974-6481, <a href="mailto:ckillion@utk.edu">ckillion@utk.edu</a>)</td>
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</table>

## College of Veterinary Medicine

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<tr>
<th>MAJOR</th>
<th>DEGREE</th>
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<th>RATING FORM</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ.D.</th>
<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
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</thead>
<tbody>
<tr>
<td>Veterinary Medicine*</td>
<td>DVM VCAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<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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</table>

## School of Information Sciences

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING FORM</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ.D.</th>
<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Sciences*</td>
<td>MS + G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Distance education available. Evaluate July 1 and Dec 1. See College of Communications for PHD. (974-2148, <a href="mailto:katwood@utk.edu">katwood@utk.edu</a>)</td>
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</table>

## Intercollegiate

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING FORM</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ.D.</th>
<th>LANGUAGE CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 865)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aviation Systems*</td>
<td>MS + G</td>
<td>3</td>
<td>X X</td>
<td></td>
<td></td>
<td>Basic science, applied science. Evaluate Apr 15 - Summer, Jul 1 - Fall, Nov 15 - Spring. Will accept early applications.(974-5572, <a href="mailto:rmoore1@utk.edu">rmoore1@utk.edu</a>)</td>
</tr>
<tr>
<td>Comparative &amp; Experimental Medicine*</td>
<td>MS + G</td>
<td>3</td>
<td>X X</td>
<td></td>
<td></td>
<td>Only offered at UT Space Institute, Tullahoma, Tennessee.</td>
</tr>
</tbody>
</table>
Admission Requirements

Admission to graduate study 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. The Graduate Council 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 study 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 an 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. 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 graduate study prior to having received the baccalaureate degree, that degree must be awarded before the date of first registration in graduate courses.

The Office of Graduate Admissions 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 graduate programs 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 Graduate Studies to safeguard the University’s standards.

Application Procedures

Anyone with a Bachelor’s degree from a regionally accredited institution or foreign equivalent who wishes to take courses for graduate credit, whether or not the person desires to become a candidate for a degree, must make formal application for admission to graduate study or apply for transient status. No action is taken until a file is complete. The applicant will be notified by mail of the action taken.

To apply for admission, the following materials must be sent to Graduate Admissions:

1. The completed Graduate Application for Admission (inside front cover of the Graduate Catalog or at http://web.utk.edu/~gsinfo).
2. A $35 non-refundable application fee.
3. One official transcript from all colleges and universities attended.
4. Scores from Test of English as a Foreign Language (TOEFL) if native language is not English (refer to section on English Certification).

Additional departmental/program requirements (refer to Majors and Degree Programs chart in front of Graduate Catalog) may include:

a. Departmental application. Contact the program for forms.

b. Reference letters or rating forms. All program forms should be sent to the college or department.

c. Scores from the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT).

Application forms for the GRE, GMAT and TOEFL can be obtained by contacting:

Educational Testing Service
Princeton, NJ 08450
http://www.ets.org
Examination results reach the University in approximately six weeks.

All documents submitted become the property of the University and will not be returned.

For international graduate student application procedures, see also Admission of International Students.

Admission Classifications

DEGREE ADMISSION

Admission to a degree program requires that a person meet the minimum admission requirements and any additional program requirements (see Admission Requirements). Refer to the appropriate field of instruction for specific requirements for admission to the degree program.

In addition to meeting the minimum requirements, applicants at the doctoral level must have demonstrated a 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 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 admission requirements 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 admitted to a certificate program or a degree program.
TRANSENT 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 form 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.

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 and be recommended by the program.

Admission of International Students

For admission to a graduate program, 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 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.

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

- Fall: 1 March
- Spring: 15 July
- Summer: 15 November

The Office of Graduate Admissions 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 payable to the University of Tennessee. 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 at least 2 months prior to term of first enrollment.
5. Certification of English proficiency. Refer to section on English Certification.
6. Documented evidence 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. Departmental application. Contact the program for forms.
   b. Refer to GRE or TOEFL requirement. All program forms should be sent to the college or department.
   c. Scores from the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT).
   d. 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 Office of Graduate Admissions 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 programs require higher scores. The score must be no more than two years old from the requested date of entry. Applicants who have received a grade 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 graduate study, 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 Dean of Graduate Studies. 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.

Readmission

A student who has not registered for graduate courses at UT for three consecutive terms (including summer) must apply for readmission. A readmission application should be submitted to the Office of Graduate Admissions 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 Office of Graduate Admissions. 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 online or from the Office of Graduate Admissions. 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 degree program, or from one degree to another within the same department.

The student must be in good standing for a revision to be processed. Acceptance into a new degree program is contingent upon review and recommendation by that department. If the student is not accepted into the program requested, he/she remains in the former program. The results of each request for program change are communicated to the student by mail.
Registration and Enrollment Requirements

Graduate Credit

To earn graduate credit, a student must be admitted by the Dean of Graduate Studies 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 changed retroactively 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 (1) meet the criteria of an assistant professor or above as defined in the Faculty Handbook and (2) 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 will exceed expectations for undergraduates. Graduate and undergraduate completion of the same course will not be considered equivalent. 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 college or by departments, where the college has given them that responsibility. All departments/offices have a statement of criteria used in eligibility to teach at the 600 level.

Undergraduate and Professional Students

UT SENIORS

Subject to approval by the Dean of Graduate Studies, 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 Student Services. 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 a graduate degree.

UT VETERINARY MEDICINE STUDENTS

A student in good standing in the College of Veterinary Medicine may enroll in UT undergraduate courses 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 Student Services. 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 Dean of Graduate Studies 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 Student Services. 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. Graduate certificate programs require a minimum of 12 semester credit hours taken at 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 Office of the University Registrar. 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 rate. Registration for day and evening classes is handled by the Evening School, 451 Communications Building, (865) 974-5361 or 1-800-676-8657.

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.
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 charge awarded, i.e., 15 hours per semester hour.

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 graduate study. 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 transferrable.

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). A student may not take more than 9 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 as part of the programs offered by Graduate Student Services. 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 with the Dean of Graduate Studies. 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 offered in 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 one. 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 Timetable of Classes or at Circle Park Online each term. Registration is accomplished via telephone or web. 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 University Registrar's Office, (865) 974-2101.

Failure to pay tuition and fees before the deadline, as noted each semester on the schedule/bill, 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 Student Services. 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 for graduate study 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. Students who are not taking coursework and are not yet eligible to register for thesis or dissertation hours, must register for course 502 (Use of Facilities) if they wish to have borrowing privileges in the University Library or to use computer labs, other labs, or other university resources.

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.

With permission of the instructor, an undergraduate student with at least a B average (3.0) may take a 500-level course for undergraduate credit. Exclusions include course 500, 502, and independent or directed study courses for which there are appropriate undergraduate course alternatives.

The official course title appears following the course 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 prerequisites 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 in each course description. Corequisite courses may be taken prior to or concurrently with the specific course. Both prerequisites and corequisites are checked during registration. Recommended prerequisites should be taken previously but are not mandatory. Required background is the knowledge base needed before taking the course.

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 6-11 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.
required.

P/NP (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. 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 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-F. Grades of S/NC, P/NP, and I, which have no numerical equivalent, are excluded from this computation.

Departments and programs may have requirements for continuation or graduation in addition to the minimum requirements set forth in this Catalog for all graduate programs. It is the student’s responsibility to be familiar with the special requirements of the department or program.

ACADEMIC PROBATION

Upon completion of nine hours of graduate coursework, a graduate student will be placed on academic probation when his/her cumulative GPA falls below 3.0. A student will be allowed to continue graduate study in subsequent semesters if each semester’s grade-point average is 3.0 or greater. Upon achieving a cumulative GPA of 3.0, the student will be removed from probationary status.

DISMISSAL

If a student is on academic probation, the degree or non-degree status will be terminated by the Dean of Graduate Studies if the student’s semester GPA falls below 3.0 in a subsequent semester. When the particular circumstances are deemed to justify continuation, and upon recommendation of the appropriate academic unit and approval of the Dean of Graduate Studies, a student on probation whose semester GPA is below 3.0 may be allowed to continue on a semester-by-semester basis.

Dismissal of a graduate student by a department or program is accomplished by written notice to the student, with a copy to Graduate Student Services. In those cases where the department’s requirements for continuation are more stringent than University requirements for graduate programs, the Dean of Graduate Studies will evaluate the student’s record to determine whether the student is eligible to apply for a change of status and register in another area of study. Registration for courses in a department from which a student has been dismissed will not be permitted, except by written authorization from that department.

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 that:

- 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 using the 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 photograph).

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 Graduate Studies 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 Student Services. 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 Graduate Studies, the Graduate Council, and ultimately to the Provost.

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.

Appeal procedures in regard to allegations of misconduct or academic dishonesty are presented in Hilltopics under “Student Rights and Responsibilities.” Students with grievances related to race, sex, color, religion, national origin, age, disability or veteran status should file a formal complaint with the Office of Diversity Resources and Educational Services (DRES).

Degree Program Requirements

A complete list of programs is found under the 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 the Summary of Procedures charts, and refer to the Graduate Studies Web Page each semester for specific deadlines. Department policies and procedures, which are specific to degree programs and courses in the Graduate Catalog, are provided in the Graduate Student Handbook available in each academic department.

The following are the Graduate Council’s minimum requirements for degree programs.
Refer to the Fields of Instruction for additional program requirements.

Definition of Graduate Terms

**Major:** The principal educational interest of a student as represented by one of the curricula prescribed by the various units at UT. The major specifies the minimum requirements for a degree.

**Minor:** An area of interest secondary to the major that is represented by a specified set of hours and/or courses. Diffs from “concentration” in that a minor is not a subdivision of the major.

**Concentration:** A collection of courses within a major that focuses on a particular subject area. The term “concentration” describes the nature of the set of courses.

**Option:** The means of designating thesis/non-thesis requirements.

**Cognate:** A limited block of courses or hours required outside the unit in which the major is offered.

**Specialization:** A sub-collection of courses within a concentration that focuses on specific subject matter. The term “specialization” describes the nature of the set of courses.

**Track:** A separate route leading to the same degree but with different requirements.

**Tool:** A limited block of courses or hours required to enhance research or methodological expertise.

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 minor 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 at UT, a course must:

1. be taken for graduate credit.
2. carry a grade of B or better.
3. be 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 Dean of Graduate Studies 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. Credit 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 institution.

**MASTER’S DEGREE**

A minimum of one-half of the total hours required for a master’s degree must be taken at UT. 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.

**ED.S. 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 in paper or electronic format to the Thesis/Dissertation Consultant in the Office of Graduate Student Services for examination. (Refer to Dissemination of Final Copies regarding different submission processes.) The Consultant will review the material and assure that it is appropriately presented, free of technical errors in format, suitable for binding or for electronic submission, and reflects credit upon graduate education at the University of Tennessee. 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 Guide to the Preparation of Theses and Dissertations (available on the Graduate Studies website) provides the correct format for theses or dissertations. Workshops are held periodically throughout the academic year. The date for each workshop is announced on the Graduate Studies website.

**FOREIGN LANGUAGE**

The thesis/dissertation normally should be written in English. Under exceptional circumstances, another language may be used if prior approval is obtained from the Dean of Graduate Studies. A request to write in a language other than English should be submitted to the Dean of Graduate Studies 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.

**CLASSIFIED RESEARCH**

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 Graduate Studies. Should the research become classified in the course of a project, these same persons should be notified immediately so that proper procedures can be assured. Failure to comply with these requirements may lead to rejection of a thesis or dissertation manuscript.

**DISSEMINATION OF FINAL COPIES**

Paper copies approved for final submission will be sent to the University Libraries bindery one month after conferral of the graduate degree. One of the bound copies will be placed on the shelf in Hodges Library for circulation, the second bound copy will be placed in Library Archives. The circulation copy will appear in the library catalog and on the shelf approximately one year after conferral of the graduate degree. Electronic copies approved for final submission will be cataloged and placed on the ETD website (http://etd.utk.edu) approximately four weeks after the conferral of the graduate degree. At this time, the electronic copies will be in the public domain via the library catalog and the ETD website.
Graduation

A student planning to graduate must submit an application for graduation the term he/she intends to graduate. The graduation application begins the final checking of degree requirements and is used to order the diploma. If the student does not graduate that term, a new graduation application must be submitted for the appropriate term. The form is submitted to the Office of the University Registrar. Deadlines and steps to graduation are available on the Graduate Studies website. Also refer to Summary of Procedures for Master’s, Ed.S. and Doctoral Degrees.

Commencement and doctoral hooding ceremonies are held in fall and spring terms. There is no ceremony in summer term.

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.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 thesis 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 indicates agreement that the student has demonstrated ability to do acceptable graduate work and that satisfactory progress has been made toward a degree. This also 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 the University Registrar no later than the last day of classes 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 the semester in which the thesis is accepted by Graduate Student Services. 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 most recent Guide to the Preparation of Theses and Dissertations, available at http://web.utk.edu/~thesis. Paper or electronic submission will be approved by the student’s committee prior to final preparation of the thesis. Two paper copies or an electronic copy of the thesis must be accompanied by two approval sheets, signed by the members of the master’s committee. The approval sheets reflect the final format for submission. The approval sheets certify that the committee members have examined the final copy of the thesis and have found that its form and content are 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 Dean of Graduate Studies, the examination must be given in University-approved facilities. This examination should be scheduled through the academic department at least two weeks prior to the examination. This examination must be held at least two weeks before the final date for acceptance and approval of thesis by the Office of Graduate Student Services on behalf of the Graduate Council. 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 department 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 Dean of Graduate Studies, the examination must be given in University-approved facilities. It should be scheduled through the academic department at least two weeks prior to the examination. 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 Dean of Graduate Studies. 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 Office of Graduate
Admissions, 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. 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.

**ADMISSION TO CANDIDACY**

Admission to candidacy indicates agreement 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 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 the Registrar 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 earned 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 Office of Graduate Student Services on behalf of the Graduate Council. The thesis must be prepared according to instructions in the UT Knoxville Guide to the Preparation of Theses and Dissertations (8th ed.), and approved by the student’s committee prior to submission to Graduate Student Services 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, or written and 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 should be scheduled through the academic department at least two weeks prior to the examination and will be conducted in University-approved facilities by the student’s committee. 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 scholarly 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 residence 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 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 Dean of Graduate Studies.

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 Graduate Student Services.

**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 in the semester 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 the University Registrar at least one week prior to the examination and must be conducted in University-approved facilities. 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 Graduate Student Services. 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 the Registrar in accordance with the dates and times for the examinations published online.

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 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 doctoral degree, a minimum of two consecutive semesters of residence is required. Individual doctoral programs may have additional residency 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 on the Graduate Studies web page.

ADMISSION TO CANDIDACY
Admission to candidacy indicates agreement 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 Office of the University Registrar 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 semester and the semester in which the dissertation is approved and accepted by Graduate Student Services. 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, approved by the major professor, will be submitted by the student and filed in the Registrar's Office.

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 with a half-time effort on the dissertation should register for 12 hours of course 600 per semester.

Paper or electronic submission will be approved by the student's committee prior to final preparation of the dissertation. Two paper copies or an electronic copy of the dissertation (prepared according to the regulations in the most recent Guide to the Preparation of Theses and Dissertations, available at http://web.utk.edu/~thesis) must be submitted to and accepted by the Office of Graduate Student Services on behalf of the Graduate Council. Each dissertation must be accompanied by two approval sheets, signed by all members of the doctoral committee. The approval sheets reflect the final format for submission. The approval sheets certify to the Office of Graduate Student Services that the committee members 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.
Fees and Financial Assistance

Residency Classification for Tuition Purposes

A prospective student who applies for graduate study 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 Student Services. 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 Legislature of this State.
(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 emancipated 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 conferring the status of an in-state student on such emancipated person.
(6) "Continuous enrollment" shall mean enrollment at a public higher educational institution or institutions of this State as a full-time student 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."
Enrollment shall be deemed continuous notwithstanding his or her enrollment occasioned solely by the scheduling 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 classified "in-state" who is domiciled in this State shall be classified "in-state" for fee and tuition purposes 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, but shall be required to pay out-of-state tuition if transferred on military orders.
(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 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 and 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. This 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 Dundy County or Pemiscot 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. (THEC may adjust the number of non-residents admitted pursuant to this section every three years.)
Final Registration.

Prepaid, or waived. Late registration fees are subject to subsequent audit and verification.

Evidence to be Considered for Establishment of Domicile

If a person asserts that he or she has established domicile in this State he or she has the burden of proving that he or she has done so. Such a person is entitled to provide to the public higher educational institution by which he or she seeks to be classified or reclassified in-state, any and all evidence which he or she believes will sustain his or her burden of proof. Said institution will consider any and all evidence provided to it concerning such claim of domicile but will not treat any particular type or item of such evidence as conclusive evidence that domicile has or has not been established.

Appeal

The classification officer of each public higher educational institution shall be responsible for initially classifying students “in-state” or “out-of-state.” Appropriate procedures shall be established by each such institution by which a student may appeal his or her initial classification.

Effective Date for Reclassification.

If a student classified out-of-state applies for in-state classification and is subsequently so classified, his or her in-state classification shall be effective as of the date on which reclassification was sought. However, out-of-state tuition will be charged for any quarter or semester during which reclassification was sought and obtained unless application for reclassification is made to the classification officer on or before the last day of regular registration of that quarter or semester.

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 tuition, maintenance and course-related 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

$35

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 Admissions 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 Circle Park Online at http://orp.utk.edu 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

Fall 2001

MAINTENANCE FEE

Full Time (9 hours or more) $1,865

Per Semester $1,865

Part Time (8 hours or less) $208 per credit (or audit) hour or fraction thereof; minimum charge $208.

OUT-OF-STATE FEES

Fall 2001

MAINTENANCE FEE AND TUITION

Full Time (9 hours or more) $5,633

Per Semester $5,633

Part Time (8 hours or less) $627 per credit (or audit) hour or fraction thereof; minimum charge $627.

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 $100

Part Time (8 hours or less) $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 3-5 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

Per Semester (8 hours or less) $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 applicable Technology Fee. The Technology Fee is mandatory and may be refunded on the same percentage scale as maintenance and tuition charges.

FACILITIES FEE

The Facilities Fee is a mandatory fee assessed to all students enrolled in credit

## Fees and Financial Assistance

Per Semester: $150

Per Summer Term: $90

Part Time: $10

Per Summer Term: $7

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

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### FACILITIES FEE

The Facilities Fee is a mandatory fee assessed to all students enrolled in credit
and audit courses. The fee is used to provide students with upgraded classroom facilities, expand information technology into the classroom, and fund campus infrastructure improvements. These revenues are targeted to assist in funding a backlog of campus and classroom projects that will enhance the University's facilities. The fee is $25 per semester for full-time, in-state students and $150 per semester for full-time, out-of-state students. The fee will be pro-rated for part-time students.

MUSIC FEE

One-half hour lesson per week
per semester ........................................ $80
One-hour lesson per week
per semester ....................................... $160

Payable by students receiving individual instruction in music.

SPECIAL COURSE FEES

Academic areas, such as Art, Biology, Chemistry, Engineering, 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 microfilming. 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. The hood rental fee is paid at the University Book and Supply Store.

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

(See Tuition Payment Plans) $20

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.

Students are responsible for charges and fees which are to be paid by a third party. Non-Person Entity (NPE) accounts, which include government sponsored agencies and private organizations, are automatically assessed a $10.00 billing fee when an authorization is presented to the Bursar's Office. Late authorizations and payments are subject to late payment fees and University schedule cancellation policies and procedures.

PRIORITY REGISTRATION

For a priority registered student, payment or a Confirmation of Attendance Form is due by the published due date, or the student's schedule will be cancelled. Failure to receive a statement does not relieve students of their obligation to pay or confirm by the due date. The due date is published in the Timetable of Classes available from the Registrar's 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 of Classes available from the Registrar's 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:

- Beginning of Final Registration through 1st full week of classes .................. $20
- 2nd week of classes ......................... $40
- 3rd week of classes ....................... $60
- 4th week of classes ....................... $80
- After 4th week of classes ................ $100

- 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 that have a balance after mid-semester will be assessed a reinstatement fee of $45. Grades will be withheld until all fees are paid in full.

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 redepósited. 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:

1st returned check--If the 1st returned check is not within 1 calendar year of the first 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.

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.

3rd returned check--Check writing/check cashing privileges are suspended for 1 year from the date of the third check.

4th returned check--Check writing/check 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 mid-semster.

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 fine 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 to the originating 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 Student Services 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 of the official 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 Student Services 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 60% refund/40% 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 return of Title IV funds policy.

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 and/or repayment and distributing the correct amount to the financial aid programs according to the return of Title IV funds policy.

Refund/Repayment Examples: Undergraduate Student

Withdrew 21 days after classes began
Received Stafford loan of ......................$1,940
(Acual loan amount $2,000)
Tuition charge .................................$1,767
Art fee of .........................................$15
Institutional charge totaled ..................$1,907
Refund to Title IV program is ..............$1,205.22

Graduate Student

Withdrew after 60% of semester completed
Received Stafford loan of ....................$4,122.50
(Actual loan amount $4,250)
Institutional charge totaled ..................$2,205
Refund to Title IV program is ..............$0

Graduate Student

Withdrew 93 days after classes began
Received Stafford loan of ....................$4,122.50
(Actual loan amount $4,250)
Total institutional charges were ..........$2,265
Refund to Title IV program is ..............$1,012.46

Note: The above are examples of the current award year and are subject to change.

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

Students 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 day of University classes. An 80% refund/20% charge is made for courses dropped between 9 and 10 business days following the day before the first official day of University classes. 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 percent 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 or on cpo.utk.edu. Any refund due for dropped courses will be made after the drop deadline, which is published in the Timetable of Classes.

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 maximum charge for a complete regular semester. 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 is 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 State or UT employee/spouse/dependent waivers.

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.

VOLCARD

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 on 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 apply.

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 Office of Graduate Student Services administers the Hilton A. Smith Graduate Fellowships and the Herman E. Spivey Graduate Fellowships. These awards are for full-time study at UT, and awardees are selected on the basis of high achievement, broad intellectual ability and potential for significant career contributions. Candidates from any field of study are invited to apply for the Hilton A. Smith. Candidates for graduate study in the humanities are invited to apply for the Herman E. Spivey fellowships. The Hilton A. Smith and the Herman E. Spivey fellowships include monthly stipends, tuition, and maintenance fees. Application packets and information are available from November through January on the Graduate Studies website. Completed applications, including all supporting materials, must be submitted by February 14. Offers of awards are announced on or after March 14.

ACADEMIC COMMON MARKET

The Academic Common Market is an agreement among Southern states for sharing unique programs. Participating states can make arrangements for their residents who are fully admitted to specific programs at UT to enroll on an in-state tuition basis if these programs are not available in the state of residence.

Cooperating states in the Academic Common Market are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia. Fifteen doctoral and twenty-four master’s programs at UT are approved by the Academic Common Market for residents of these states to enroll at in-state tuition rates.

Students must be fully admitted to the appropriate degree program, and the letter of certification must be received in the Office of Graduate Admissions no later than the first day of classes for the effective semester.

Residents of member states who seek further information should contact the Administrative Services Assistant in the Office of Graduate Admissions (865) 974-3251, or the Southern Regional Educational Board, 592 Tenth Street, N.W., Atlanta, GA 30318-5790, tel. (404) 875-9211, FAX (404) 872-1477, e-mail ann.creech@sreb.org or info@sreb.org or visit the SREB website at http://www.sreb.org.

EMPLOYMENT

The Office of Financial Aid and Scholarships coordinates the Federal Work Study Program which provides part-time off- and on-campus jobs for U.S. citizens or permanent residents who have demonstrated financial need by completing the Free Application for Federal Student Aid (FAFSA). A wide range of jobs are available in academic units, administrative offices, and non-profit agencies.

GRADUATE STUDENT TRAVEL FUND

The University Program and Services Fee (UPSF) Graduate Student Travel Fund is administered by the Office of the Dean of Students in cooperation with the Graduate Student Association and the Dean of Graduate Studies. Allocations from this fund are utilized to provide travel awards for UT graduate students attending professional meetings. The awards are made on the basis of merit, not need, and allow for partial reimbursement of transportation, lodging and registration expenses.

Travel award requests must be filed using the current UPSF Graduate Student Travel Fund application. Applications can be picked up at the Office of the Dean of Students (413 Student Services Bldg.) or downloaded from the GSA website at http://web.utk.edu/~gsa. Applications must be submitted to the Office of the Dean of Students by the following deadlines:

- Summer Term: April 22
- Fall Semester: September 2
- Spring Semester: November 11

LOANS

Students must apply through the Office of Financial Aid and Scholarships for all loan programs. Loans are limited to U.S. citizens and certain permanent residents. Additional paperwork is required on subsidized/ unsubsidized Stafford Loans.

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 may have to 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 Office of Financial Aid and Scholarships, 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 in Room 209, Student Services Building. Maximum benefits are paid by the Department of Veterans Affairs 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, sex, 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, 413 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 the 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—heart attack, 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-fourth to one-half time basis, and the annual stipend is payable in either nine or twelve 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 assistant is not capitalized (except in headings), reference is to all four 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 assigned. 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 gifts, 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 Dean of Graduate Studies, excluding Summer term. 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 if any other unit employing the student of any assistantship awarded at the time of its initiation or renewal.

QUALIFICATIONS OF GRADUATE ASSISTANTS

Graduate assistants must be currently enrolled in graduate study (as fully-admitted degree-seeking students, non-degree students, or transient graduate students). The Southern Association of Colleges and Schools (SACS) 18-hour requirement must also be met.

SACS Requirement

Regulations specifically addressing the 18-hour requirement are excerpted from Section 4.8.4 of the SACS publication, *Criteria for Accreditation*, (Atlanta, 1996, p. 50) and read as follows:

[Graduate teaching associates] who have primary responsibility for teaching a course for credit and/or for assigning final grades for such a course, and whose professional and scholarly preparation does not satisfy the provisions of Section 4.8.2 [which relate to exceptions] must have earned at least 18 graduate semester hours in their teaching discipline, be under the direct supervision of a faculty member experienced in the teaching discipline, receive regular in-service training, and be evaluated regularly.

The above requirements do not apply to graduate teaching assistants engaged in assignments such as assisting in laboratory sessions, teaching physical education activities, attending or helping prepare lectures, grading papers, keeping class records, and conducting discussion groups.

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 PAF 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, 404 Andy Holt Tower.

COMPETENCY IN ENGLISH

The University of Tennessee requires all who teach 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 through the Office of Graduate Student Services. The Test of Spoken English (TSE) may be taken in lieu of the SPEAK Test. The results of this test will be communicated to the appropriate department to be used in determining the nature and extent of instructional or other duties assigned the Graduate Teaching Assistants or Graduate Teaching Associates. Suggested modes of remediation will be given to the department and graduate student when appropriate.

New international students who have been offered an appointment as Graduate Teaching Assistant or Graduate Teaching Associate will take the SPEAK test after their arrival at UT, and the results of the test will be used to determine the nature of their assignment. The student who has already taken the TSE and received acceptable scores may be excluded from the requirement of taking the SPEAK test. Validation of competence in communicat-
RIGHTS/RESPONSIBILITIES OF GRADUATE ASSISTANTS

1. As specified in the Personnel Policies and Procedures Manual (Section 100-105-Pr3, p. 2), "A student employee is one whose primary function is that of enrollment in an academic program." Thus, first priority of all graduate assistants must be satisfactory progress in their scholastic program. At the same time, acceptance of an assistantship is predicated on the belief that satisfactory progress can be concurrently achieved in work assignments and scholastic programs. Collaborative efforts between graduate assistants and their supervisors should be focused on the goal of satisfactory performance in both these 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 Dean of Graduate Studies should be contacted. Established procedures outlined in the Graduate Council Appeals Procedure and/or Hilltopics will be followed.

3. Graduate assistants' benefits as employees of the University of Tennessee, in addition to fee waivers as explained 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 100-105-Pr2-3).

4. Graduate student assistantship appointments (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 months 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 allow this 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 Graduate Studies.

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 Hilltopics. 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. Appointments are reviewed at the end of each academic year. The evaluation, review of 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 should review the assistant's work with the assistant and take appropriate follow-up action.

In cases where corrective measures must be taken to remediate deficiencies, the graduate assistant should be notified in writing of reasons 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/college supervisor of graduate assistants (where one exists), the appropriate project director, department head, dean of the college, and the Dean of Graduate Studies.

ORIENTATION/TRAINING OF GRADUATE TEACHING 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 Office of Graduate Student Services 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.

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 actual 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 prior to 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 programs and services as an ongoing part of the University’s retention efforts. The Tutorial and Early Alert Programs, along with the library, computer lab, student lounge, and multi-purpose area, serve as an extension to services provided across campus. The Center houses several student organizations that plan activities ranging from guest lecturers, Black History Month events, Welcome Week activities, and carnivals to renown speakers such as Maya Angelou, Tavis Smiley, Cornel West and Alice Walker.

The new Center opened in April 2002 is located at 1800 Melrose Avenue. It is a testament to the University’s commitment to the entire student population and is a unique, landmark structure. 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 opportunity 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, annual reports 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 each 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. Visit the website at http://career.utk.edu.

**Center for International Education**

The Center for International Education (CIE), located at 1620 Melrose Avenue, promotes and supports all aspects of international education and international exchanges at UT, both for American students and faculty and for students and faculty from other countries. CIE coordinates the administration of official linkage agreements between UT and institutions of higher education in other countries.

**Programs Abroad:** The University of Tennessee strongly encourages students to undertake a semester, summer or academic year of study outside of the United States. Time spent abroad increases a student’s ability to understand another culture, helps them better understand their own country and its place in the world, and enhances their resume. In addition students gain confidence as they successfully face the unique challenges of living abroad.

The Programs Abroad Office (PAO) can help students find an opportunity that meets their needs. Programs are available in many countries, vary in length from 10-days to a full academic year, and sometimes cost only a little more than it would cost to attend UT. Financial Aid can be used and credits transfer back to fulfill university requirements. Advanced planning helps assure that study abroad does not delay graduation.

In addition to formal study abroad, the PAO has information about other types of opportunities for graduate students to enjoy a significant international experience. These include volunteer programs, work-based experiences including teaching English abroad, internships, and experiential learning. Students are encouraged to visit the PAO to learn more about the international opportunities available to them.

**International Scholarships:** CIE coordinates campus administration of such international grants and scholarships for students as the Fulbright, Rhodes, Marshall, David L. Boren NSEP, W.K. McClure, and provides information about other sources of funding for overseas study and research, including the Rotary Foundation and German Academic Exchange Service (DAAD) grants. CIE also administers the UT portion of the University of Bonn’s Transatlantic Summer Academy (TASA) for graduate students and upper-division undergraduates. Within its library on study, work and travel abroad, CIE has information on student summer job programs in seven countries.

**International Students and Scholars:** CIE provides information and assistance in matters relating to United States visa issues and U.S. Immigration and Naturalization Service regulations. It produces The Link, an on-line 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 semester facilitate adjustment to the campus and community, and provide essential information related to U.S. laws for international students.

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

**Contacts:** International students seeking admission to UT should contact directly the Office of Graduate Admissions, email: gsinfo@utk.edu. Contacts for general inquiries to CIE are cie@utk.edu, Tel. 865 974-3177, website: http://www.UInternational.org. The I-House web address is http://web.utk.edu/~globe and the phone 865 974-4453.

**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.
Eaten
THE VARSITY INN FIFTEEN PLAN+
Sophie’s Place, and Morrill Dining facilities. Students also receive $300 bonus bucks per semester.

THE ANY TEN PLUS PLAN*
Students choose up to 10 meals weekly that may be eaten at Presidential Court Cafe, Sophie's Place, and Morrill Dining facilities. Students also receive $500 bonus bucks per semester.

UNLIMITED ACCESS PLAN*
This plan allows students to eat as much as they want as often as they like at Presidential Court Cafe, Sophie’s Place, and Morrill Dining facilities. Students also receive $100 bonus bucks per semester.

THE ANY TEN PLAN*
Students choose up to 10 meals weekly to be eaten at Presidential Court Cafe, Sophie’s Place, and Morrill Dining facilities. Students also 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.

*Fees are paid on a per semester basis.
*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 plan begins on Monday at breakfast and ends on Sunday after lunch. 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.
*Meal equivalency is another feature of the meal plan that may be used at select retail dining facilities. Certain restrictions apply at these locations.
*Any Ten Plus and Any Ten meal plan participants can eat all meals exclusively at Varsity Inn Dining. Please contact Dining Services at (865) 974-4111 for more information.
*Students living in North Carrick, South Carrick, Humes, Reese, Gibbs and Morrill Halls are required to select a meal plan.
*Students may choose to eat at any Dining Services’ facility. Please call the VolCard office at (865) 974-3430 for more information on these accounts.

To initiate or amend a meal plan, call UT Dining Services at (865) 974-4111.

Early Education Programs
The Child Development Laboratories, located at the corner of Peyton Manning Pass and Phil Fulmer Way, offers complete diagnostic and treatment services to all University students with speech and language disorders/differences. Services are available to any student who has paid the full University Programs and Services Fee or, if part-time, any student who has paid the optional student health service fee. A fee for special testing may be charged.

The Hearing and Speech Center serves as the 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.

Graduate Student Association
The Graduate Student Association is the organization that represents graduate and professional students at the University of Tennessee. Each graduate and professional program of study has a representative elected by the student body. Graduate students and the GSA President and Vice President are elected in the annual SGA elections. GSA has representatives on the various university-wide committees and also represents graduate and professional student concerns to the Graduate Council.

For more information on the GSA, call (865) 974-237, email: gsa@utk.edu, or check the website at http://web.utk.edu/~gsa.

Hearing and Speech Services
The Hearing and Speech Center, located at the corner of Peyton Manning Pass and Phil Fulmer Way, offers complete diagnostic and treatment services to all University students with speech and language disorders/differences. Services are available to any student who has paid the full University Programs and Services Fee or, if part-time, any student who has paid the optional student health service fee. A fee for special testing may be charged.

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 Department of University Housing provides housing on-campus for single graduate students. Graduate students are given the same priority for housing in residence halls as undergraduate students. All of the residence halls are conducive to academic achievement and personal development. However, many graduate students choose to live in Melrose or the Apartment Residence Halls, since they remain open between the Fall and Spring semesters. Melrose Hall is arranged into smaller communities of six to ten students with personal responsibility emphasized. The Apartment Residence Hall provides apartment-style living for four students. An attempt is made to assign graduate students together to the extent possible. It is the responsibility of each resident to maintain the apartment to University standards. Applications and further information can be obtained from the Department of University Housing, 405 Student Services Building.

A limited number of Assistant Hall Director positions are available for single graduate students. This position assists the Hall Director in coordinating and supervising all aspects of the hall operation. This is a live-in position with part-time responsibilities for a nine-and-a-half month period. For additional information, contact the Department of University Housing at 974-2571.

OFF-CAMPUS HOUSING
A list of off-campus housing available to students is provided by the Department of University Housing, 405 Student Services Building. This list may be found at the University Housing website at http://web.utk.edu/~reshalls. The University does not inspect or approve these facilities. The terms and conditions for the rental of off-campus housing are between the student and the landlord. Students living in off-campus housing are expected to observe the same rules of conduct and standards applicable to all students.

Minority Student Affairs
The Office of Minority Student Affairs is housed in a two-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 1800 Melrose Avenue, provides academic, educational, social and cultural programs to assist with the academic performance and retention of African-American students. Programming through the Office includes mentoring programs for freshmen and upperclassmen, academic support, leadership opportunities, graduate networking, and workshops for all students on a variety of academic, intellectual, and
Office of Disability Services

The Office of Disability Services (ODS) is committed to providing equal opportunities for students and employees with disabilities at the University of Tennessee. The primary objective for the office is to eliminate accessibility barriers to provide individuals with disabilities equal access to academic, social, career, cultural and recreational opportunities offered within the university.

To ensure that services are provided in a timely manner, prospective students with disabilities are encouraged to contact ODS one month prior to the semester in which they plan to attend. Contact with the students prior to registration enables the ODS staff to better assess the need for interpreters, readers, accessible facilities, and other support services. Van service is also provided to those individuals with mobility limitations, whether permanent or temporary. Documentation of the disability within the past 3 years from an attending physician or psychologist is required.

To contact the office, call (865) 974-6087, fax (865) 974-9552 or e-mail: ods@utk.edu. Visit the website at http://ods.utk.edu.

Religious Resources

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 Counseling Services Center

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 concerns. 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 times, students can call the Center to schedule some other time. Anyone experiencing a crisis during the week is seen immediately between 8:00 a.m. and 5:00 p.m. After these hours, students are encouraged to go to the UT Medical Center emergency room.

The Center is located at 900 Volunteer Blvd. 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.

The Health Service has a regular staff of primary care physicians, nurses, laboratory and x-ray technicians of Tennessee licensure. Outpatient services in the fields of family practice, internal medicine, pediatrics, sports medicine and psychiatry are available on a full-time basis while specialty consultants in dermatology, physical therapy, surgery and gynecology are available on campus through referral by a staff physician. Care beyond that provided by the regular staff can be arranged. Those students requiring allergy injections may arrange to receive them at the Clinic.

Students traveling abroad may receive information, health alerts, and immunizations through the Travel Clinic (974-8647). Most medical services at the campus clinic are provided to eligible students at no additional cost.

The primary clinic at 1818 Andy Holt Avenue maintains scheduled daytime hours Monday through Friday. While urgent-care needs may be handled on a walk-in basis, appointments should be made in most instances (appointment line: 974-3648). After-hours care (nights, weekends, and holidays) is available, at reduced rates, through the emergency room at The University of Tennessee Memorial Hospital. Transportation service for the campus is provided by the Campus Police and the Escort Van Service.

The State of Tennessee requires that all students born after 1 January 1957 must provide proof of immunization with two doses of Measles, Mumps and Rubella vaccine for attendance to all universities and colleges. This documentation must be provided to the Student Health Service. In addition, the University of Tennessee Student Health Service recommends that entering college students assure immunity to Tetanus/Diphtheria, Polio, Hepatitis B, and Chicken Pox. The American College Health Association recommended that students, particularly freshmen living on campus, consider receiving meningitis immunizations.

Students requiring hospitalization are generally admitted by an appropriate specialist to The University of Tennessee Medical Hospital. Other arrangements are desired. Since inpatient care is sometimes necessary, it is important for the student to have hospitalization insurance. Student group health insurance is available and may be purchased at the beginning of each term.

Health Service personnel will cooperate with students and family physicians in ensuring the continuity of quality health care during the university career.

Vehicle Operation and Parking

The University of Tennessee endeavors to provide adequate facilities for vehicles operated by students and staff. However, areas available for parking are limited. To reduce traffic congestion within the campus area, large student parking areas are located on the perimeter of the campus. Free bus service is provided from the Main Campus to the Agricultural Campus and Perimeter Lot located off Concord Street behind Tyson Park. Also, bus service is provided to University Apartments at a nominal fee.

Each person who operates a motor vehicle in connection with attendance or employment at the University must register that vehicle with the Parking Services Office. There is no charge for vehicle registration; however, a parking permit is required for parking on all University lots, streets, parking structures, or leased lots with the following exceptions:

1. Staff and students with current UT parking permits may park in unreserved staff areas from 5 p.m. to 3 a.m. After this time, vehicles without permits for these areas may be towed.

2. Parking is not permitted in the Student Commuter Parking Areas nor in the Student Aquatic Center Parking Area between 3 a.m. and 6 a.m. except by special permit.

3. At times, certain areas will be reserved for parking for special events, such as athletic events, conferences, etc. Parking for these events will be by special parking permit for the specific event.

A University Traffic and Parking Authority determines parking policy, traffic regulations, and fees. This information is published each year in the “University Traffic and Parking Regulations”, and is available at the Parking Services Offices located in Room 24 of the University Center and at 2121 Stephenson Drive. Information is also available from Campus Information Center at Circle Park.

Women’s Center

The Women’s Center provides essential informational and referral services to UT students and faculty. The library’s specialized collection provides books, journals, and brochures about issues and concerns of women from both a current and historical perspective. Information is available on a variety of topics including racism, violence against women, spirituality, and sex roles. The Women’s Coordinating Council is the programming branch of the Center responsible for educational, social, and cultural events pertaining to women’s issues. The Women’s Center is located in 301 University Center. If you need more information or are interested in volunteering, please call 974-1029.
College of Agricultural Sciences and Natural Resources

C. A. Speer, Dean
Mary Lewnes Albrecht, Associate Dean
Thomas H. Klindt, Associate Dean
C. Roland Mote, Assistant Dean

Departments
Agricultural and Extension Education
Agricultural Economics
Animal Science
Biosystems Engineering and Environmental Science
Entomology and Plant Pathology
Food Science and Technology
Forestry, Wildlife and Fisheries
Plant Sciences and Landscape Systems

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 units of The University of Tennessee’s Institute of Agriculture.

There are many shared resources and positive interactions between various units of the Institute. 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 opportunities. The Agricultural Experiment Station provides 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.

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 Sciences. Majors only are available in Forestry and Wildlife and Fisheries Science, and minors are available in General Agriculture. 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 with majors in Animal Science, Biosystems Engineering, Food Science and Technology, and Plant and Soil Sciences is offered in the college.

College of Architecture and Design

Marleen Davis, Dean
Max A. Robinson, Director
Jon P. Coddington, Graduate Program Head, Architecture

Schools
Architecture

The graduate program in architecture is a relatively new program, with its first class entering in 1993. However, the School of Architecture, with its professional Bachelor of Architecture program, celebrated its thirty-fifth birthday in 2000. In addition to the undergraduate and graduate programs in architecture, the College also offers an undergraduate degree in interior design. All professional programs in the College are fully accredited, enabling graduates to pursue licensure throughout the U.S.

The graduate program in architecture is a first professional degree program. It is designed to accommodate students who come from a variety of academic backgrounds and interests. This includes students who have had little or no previous formal study in the field of architecture but have discovered a deep and abiding interest in the subject. The program also accommodates students who have received an architectural education but have not completed the requirements for a professional degree. These students may receive some advanced standing in the program.

In the U.S., most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole...
agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Master's degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

UT’s Master of Architecture program received a full five-year accreditation as a result of its last NAAB accreditation review. The graduate program in architecture defines architecture broadly as the creation of human habitats. Architecture at Tennessee is more than the design of individual buildings. Rather it is dedicated to the shaping of community in the fullest sense of the word. The curriculum reflects the program's recognition that architecture is fundamentally shaped by environmental and cultural forces. As such, the humanities, social sciences, arts, and applied sciences are all brought to bear on the discipline of architecture. It is through design that such issues can be thoughtfully explored and given physical form. Thus design plays a central role in this comprehensive and creative process.

As a professional program, the College is committed to help students obtain the requisite knowledge and skills needed to enter and fully participate in the profession of architecture. At the same time, it attempts to maintain a wide vision and critically reach beyond the profession without losing contact with the realities of everyday architectural practice. Designed to be challenging and provocative, the program allows students the opportunity to develop discernment and judgment, enabling them to find their own voices as designers who are accountable contributors to the built environment.

The offices of the dean and other college staff are located at 217B Art and Architecture Building.

College of Arts and Sciences
Lorayne Lester, Dean
Don Richard Cox, Associate Dean
Susan Martin, Associate Dean
Stuart Rigsby, Associate Dean

Departments
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
Political Science
Psychology
Religious Studies
Sociology
Theatre
Urban and Regional Planning

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, less 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 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.P.S., 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 be best 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

Jan R. Williams, Dean
David W. Schumann, Associate Dean for Research and Technology
Sarah F. Gardial, Assistant Dean, Full-Time MBA Program
Patricia Postma, Assistant Dean, Center for Executive Education
William F. Fox, Director, Center for Business and Economic Research
John E. Riblett, 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,
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 and Public Relations  
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 1997. 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 communication functions. 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.

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.
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 graduate study 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.

TEACHER LICENSURE

Applicants for initial teacher licensure must gain admission to the college's Teacher Education Program. Further details concerning the teacher licensure program are described under Education, Fields of Instruction, and are available through the College of Education Student Services Center (Claxton Complex 332).

TITLE II, HEA COMPLIANCE

As required by Title II of the Higher Education Act (Sections 207(f)(1) and 207(f)(2)), the College of Education publishes annually the results of professional licensure tests mandated by the Tennessee State Board of Education and the State Department of Education.

Title II specifically requires higher education institutions that prepare teachers, principals and other P-12 support personnel to report publicly the percentage of candidates who pass licensure specialty examinations. The law also requires disclosure of the statewide pass rate which includes all institutions offering preparation programs. For the 2000-2001 reporting period, University of Tennessee licensure candidates achieved a 98% pass rate. The statewide pass rate was 91%.

Questions concerning the above information should be directed to the Associate Dean for Professional Licensure, College of Education, The University of Tennessee, Knoxville, TN.

College of Engineering

Fred D. Tompkins, Interim Dean
Fred Gilliam, Associate Dean, Academic Affairs
Luther R. Wilhelm, Interim Associate Dean, Administration

Departments

Chemical Engineering
Civil and Environmental Engineering
Electrical and Computer Engineering
Industrial Engineering
Materials Science and Engineering
Mechanical, Aerospace, and Biomedical Engineering
Nuclear Engineering

Facilities for Research and Service

Measurement and Control Engineering Center
Center of Excellence for Materials Processing
Maintenance and Reliability Center

The College had its beginnings in the University when surveying was introduced into the curriculum in 1838. The first two professional degrees, Civil Engineer and Mining Engineer, were established in 1879 at the same time that the Board of Trustees authorized the establishment of a graduate school. Known as Mechanic Arts originally, Engineering became a college in 1904.

The purpose of the College of Engineering is to educate men and women to the high levels of research, technical competence, and social understanding that will enable them to fulfill their responsibilities as professional engineers.

Graduate programs of the College of Engineering provide opportunities for advanced study leading to the Master of Science and the Doctor of Philosophy degrees. For a listing, consult majors and degrees available on the Majors and Degree Programs chart. For additional information, visit the College of Engineering website at http://www.engr.utk.edu/coe/graduate.

GRADUATE PROGRAM AT THE UT SPACE INSTITUTE

At the University of Tennessee Space Institute near Tullahoma, graduate-level courses are offered in engineering fields such as aerospace, chemical engineering, electrical engineering, engineering science, industrial engineering including engineering management, materials science and engineering, mechanical engineering, and mathematics and physics. All programs lead to the Master of Science degree. Also, Ph.D. programs are available in many of these fields. Information may be obtained from the Registrar, The University of Tennessee Space Institute, Tullahoma, TN 37388.

College of Human Ecology

James D. Moran III, Dean
Dolores Smith, Assistant Dean

Departments

Child and Family Studies
Consumer and Industry Services
Management
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 college seeks to be recognized for providing the highest quality science-based programs that serve as a benchmark of excellence.

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, 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). 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 Nonwoven 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 communications link for all efforts in nutrition sciences, quality of life in the region, and strategies that will address how to improve the economic climate and overall quality of life in the region.

The Nutrition Institute provides a communications link for all efforts in nutrition sciences, quality of life in the region, and strategies that will address how to improve the economic climate and overall quality of life in the region. Refer to the section on Facilities for Research and Service for additional information.

College of Law
Thomas C. Galligan, 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 their knowledge of the law, an awareness of the historical growth of the law, a knowledgeable appreciation of the interrelationship of law and society, and the ability to use law as an implement of social 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 into 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.-M.B.A. 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
Sandra McGuire, 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 37996-4180, (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 conditionally 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, nurse anesthesia, 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
Colleen Galambos, Acting Associate Dean, Nashville
David R. Dupper, Associate Dean, Knoxville
Hugh Vaughn, 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. It joined the University of Tennessee 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.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 foundation curriculum of the Ph.D. program is available only in Knoxville.

The College also offers a post-master's certificate program in management and community practice.
The Tennessee state school social work licensure program is available to currently enrolled M.S.S.W. students. Application materials are available from the College of Social Work, Henson Hall, Knoxville, TN 37996-3333, or at http://csw.utk.edu. Please specify M.S.S.W., Ph.D., or certificate program on the request.

College of Veterinary Medicine
Michael J. Blackwell, Dean
James J. Brace, Associate Dean

Departments
Comparative Medicine
Large Animal Clinical Sciences
Microbiology-Veterinary Medicine
Pathology
Small Animal Clinical Sciences

The College of Veterinary Medicine, established in 1974, offers a professional curriculum leading to the Doctor of Veterinary Medicine (D.V.M.) degree. The college offers graduate studies leading to the Master of Science and the Doctor of Philosophy degrees. Residency training programs in the various clinical specialties are also offered.

The primary objective of the college is to enable students to attain essential information, skills, attitudes and behaviors to meet the varied needs of society and the veterinary profession. The professional curriculum provides an excellent basic science education in addition to training in diagnosis, disease prevention, medical treatment, and surgery. Graduates are qualified to pursue careers in the many facets of veterinary medicine and related health professions.

About two-thirds of the veterinarians in the United States are engaged exclusively in pet or companion animal practice. A growing number are concerned with the health problems of zoo animals, laboratory animals, wildlife, and aquatic species. A number of veterinarians are involved in the health care of food and fiber animals ensuring the supply of safe and healthy food.

Veterinarians also find rewarding careers in the U.S. Public Health Service, the Armed Forces, and in state, county, or local health agencies. A number of veterinarians are employed by the U.S. Department of Agriculture and by state departments of agriculture for important work in livestock disease control, meat and poultry inspection, serum and vaccine production, and the protection of our country against the importation of foreign animal diseases.

Excellent research opportunities exist for veterinarians--research directly benefiting animals and research conducted with animals which benefits humans. Such opportunities are available at colleges and universities and with governmental agencies, private research institutions and biological and pharmaceutical companies.
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.

The M.Acc. degree program is a full-time, weekday program. The nature of the program precludes students from simultaneously working full-time outside of classes. 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 accepted for fall semester only, and the application deadline is March 1. Applications received after March 1 will be considered as space allows. 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 principles of accounting and introductory economics. In addition to the general admission requirements of the Graduate Council, M.Acc. applicants are required to take the Graduate Management Admission Test (GMAT) and submit information on forms provided by the Department of Accounting and Business Law. Applicants whose native language is not English must submit results of the Test of English as a Foreign Language (TOEFL).

For admission to the M.Acc. program, consideration is given to (1) applicant's academic records with particular attention to the last two years of undergraduate work, (2) scores on the GMAT, and TOEFL for those whose native language is not English, (3) internships and/or work experience and other activities that demonstrate potential for leadership, and (4) recommendations from professors and/or work supervisors. The admission decision is based on all factors that make up the total application; therefore, there is no automatic cut-off for either grade-point averages or GMAT scores.

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.

Students take 12 hours each semester and 6 hours in the first summer session. Program requirements are:

Business Core (9-12 hours*):


Accounting Concentration (12 hours): Three concentrations are available:

Assurance Services: 507, 514, 518, 519, 521, 531, 541.

Systems: 514, 519, 521, 541, 542, 549.

Taxation: 507, 531, 532, 533, 534, 539.

Students must take at least four courses from the same concentration including either 519 or 539.

Accounting Electives (6-9 hours*):

Elective courses to be taken from graduate accounting courses.

Students who do not have an undergraduate Accounting degree must complete the following prerequisites: 311, 341, 411, 414, and 431 and include 521 in their graduate program. All prerequisites must be...
completed prior to the start of the graduate program.

*As approved by the Director of the Master of Accountancy Program.

**Transfer Credits**
A maximum of six semester hours taken at other AACSB accredited institutions that otherwise conform to the transfer policy of the Graduate Council may be credited toward M.Acc. degree requirements.

**Other Requirements**
To qualify for the degree, a student must maintain a B average (3.0) or above in the program. The student must satisfactorily demonstrate his/her ability to recognize, analyze, and solve accounting policy problems and integrate concepts from the various areas of accounting by passing a comprehensive written examination. This examination is included in the capstone courses in each concentration as follows: 519 Seminar in Business Risk and Assurance Methodology and 539 Multi-Jurisdictional Tax Planning and Policy.

**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 fall 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 Administrative Services Assistant in the Office of Graduate Admissions.

**Accounting**

**GRADUATE COURSES**
415 Governmental and Nonprofit Accounting (3) Advanced study of governmental and nonprofit entities. Governmental accounting principles, revenues and expenditures, budgeting, and financial reporting. Accounting principals in reporting models of nonprofit organizations. Integration of economic and social issues with reporting standards for governmental and nonprofit business organizations. Prereq: Financial Reporting 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 various settings and techniques used in consulting to provide entity competitive advantage.

502 Registration for Use of Facilities (1-15) 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

506-07 Professional Accounting Practice I, II (3,3) Various advanced financial reporting and auditing topics to meet complex and changing needs of professionals. Prereq: Admission to M.Acc. program.

514 Risk Management in Networked Business Environments (3) Security-, integrity-, and cost-management-oriented risks and control measures for various different business system platforms and applications: centralized mainframe environments, distributed client/server environments, intranets/ extranets, electronic commerce, and ERP systems. Prereq: Admission to M.Acc. program or information management concentration, or consent of instructor. (Same as Information Management 511.)

516 Professional Standards (3) Basic standards and contemporary issues relevant to assurance providers. Actual practice cases to illustrate application. Prereq: Admission to graduate programs or consent of instructor.

519 Seminar in Business Risk and Assurance Methodology (3) Business risk and emerging methodologies used by assurance providers. Prereq: Admission to graduate programs or consent of instructor.

521 Seminar in Advanced Managerial Cost Accounting (3) Analysis of conceptual and current issues impacting 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. Prereq: Cost and Managerial Accounting and admission to a graduate business program or consent of instructor.


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

533 Taxation 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. Prereq: Admission to M.Acc. program or consent of instructor. Prereq or coreq: 531.

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

539 Multi-Jurisdictional Tax Planning and Policy (3) Analysis of international, state and local tax law as it pertains to business transactions. Identification of tax planning opportunities and design of strategies to accomplish tax planning objectives. Policy issues related to multi-jurisdictional taxation. Prereq or coreq: 531.

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

542 Electronic Commerce (3) Essential technological, strategic, and information security issues for conducting business-to-business and business-to-consumer electronic commerce. Effects of internet on business and society. Prereq: 541 or Business Administration 506, or consent of instructor. (Same as Information Management 512.)

549 Systems Issues and Policies (3) Seminar in emerging topics in management systems and technology-based systems. Prereq: 541 and admission to a graduate program or consent of instructor. Prereq or coreq: 542.

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

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

600 Doctoral Research and Dissertation (3-15) Preregistration only.

611-12 Doctoral Seminar in Accounting (3,3) Analysis of issues reflected in accounting literature. Prereq: 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. Prereq: Consent of Ph.D. program advisor.

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

693 Independent Study (3) Directed research in topic of mutual interest. Prereq: Admission to doctoral program with concentration in accounting. May be repeated. Maximum 6 hrs.

**Business Law**

**GRADUATE COURSES**

511 Business Law and Professional Responsibility (3) Legal framework and ethical implications of business transactions. Principles and practices in law of contracts, commercial transactions, real property, trusts, estates and professional responsibility. Prereq: Legal Environment of Business and admission to M.Acc. program or consent of instructor. Not available for students with credit for 401.

**Advertising**

(College of Communications)

**MAJOR**

**DEGREES**

Communications ............................... M.S., Ph.D.

Ronald E. Taylor, Head
The Department of Advertising 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

490 Special Topics (3) Topics vary: advanced media strategy, advanced creative strategy, direct marketing, and advertising and social issues. E

510 Advertising and Society (3) Analysis of advertising as an institution in a free-enterprise democratic society and its relation to social, legal, cultural, and economic institutions. F

520 Advertising and Communications Theory (3) Application of contemporary communications theories of attitude change, information-processing, and persuasion as applied to creative strategy decisions. Prereq: Consent of instructor or admission to program. Sp

530 Advertising Research (3) Nature, scope, and applications of research function to advertising decisions. Market segmentation, copy appeals, media strategy. Prereq: Statistics 201 Introduction to Statistics or equivalent. Sp

540 Advertising Planning (3) Analysis of decision-making in budgeting, creative strategy, media strategy, research, evaluation, and agency-client relationships. Advertising response functions. Prereq: Consent of instructor or admission to program. Sp

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

Aerospace Engineering

See Mechanical and Aerospace Engineering

Agricultural and Extension Education

(College of Agricultural Sciences and Natural Resources)

MAJOR

DEGREE

Agricultural and Extension Education...... M.S.

Richard Poling, Interim Head

Professors:
Lessly, Roy R. (Emeritus), Ed.D. .................. Oklahoma State
Taylor, Ronald E., Ph.D. ............... Illinois

Associate Professor:
Haley, Eric, Ph.D. .............................. Georgia

Assistant Professors:
Hoefges, Michael, Ph.D. ............... Florida
McMillan, Sally, Ph.D. .............. Oregon

The Department of Agriculture 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 adult and 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 Council 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 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 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. An assessment project. 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

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

501 Creative Component in Lieu of Thesis (3) Capstone experience completed under supervision of major professor and committee. Individual project: literature survey; development of teaching software; development of curriculum materials; development of white paper; or other suitable project. Prereq: Consent of major professor. Non-thesis majors only. S/NC only. E

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or facilities time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

511 Extension History, Philosophy and Objectives (3) Historical and philosophical foundation of adult education in American agriculture, key figures, issues and trends, legislative movement, farmer organizations and programs. Cooperative Extension Service, origin, legislation and growth and nature of present objectives and programs. Prereq: 211 Foundations of Agricultural and Extension Education or consent of instructor. Sp

521 Extension Program Planning and Evaluation (3) Theories and models of program development and evaluation; planning and conducting needs assessments; planning, organizing, implementing and evaluating extension education and extension programs; development and interaction of county, state and federal extension plans of work; and principles, techniques and instruments used to identify, gather and analyze information to evaluate extension programs. Prereq: 211 Foundations of Agricultural and Extension Education, 511, or consent of instructor. Sp

522 Educational Technology in Agricultural and Extension Education (3) Advanced concepts and methods relevant to both formal and non-formal instructional methodologies. Processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. Prereq: 435, 436 Student Teaching in Agricultural and Extension Education or consent of instructor. F

524 Research Methodology (3) Social science research methods related to research in agricultural and extension education, issues; research design, reliability and validity in measurement, sampling procedures, logic of analysis, scaling and measurement, and selection and interpretation of appropriate inferential tests of significance. Prereq: 436 Student Teaching in Agricultural and Extension Education, 511 or consent of instructor.

525 Curriculum Development in Agricultural and Extension Education (3) Methods and procedures for developing curricula in agricultural and extension education and extension programs and scheduling learning activities to implement these planned programs. Prereq: 435, 436 Student Teaching in Agricultural and Extension Education, or consent of instructor.

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

527 Adult Education Strategies in Agricultural and Extension Education (3) Methodological and practical approaches to developing and implementing educational programs for adults in agricultural and extension education and related contexts: different learning needs of adults and children (andrology vs. pedagogy); understanding and determining adults’ priorities and motivation for participating in educational programs; adoption of new ideas by adult learners; effective media and materials for teaching adults; developing favorable attitudes toward post-secondary education and life-long learning. Prereq: 211 Foundations of Agricultural and Extension Education, 511 or 346 Instructional Strategies for Teaching Agricultural Education or consent of instructor. Sp

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

532 Managing Organizations, Programs and Personnel (3) Theory and principles of management for individual and organizational effectiveness of agricultural organizations. Prereq: 511, 521, or consent of instructor. Sp

533 Agricultural Leadership Development (3) Identification of styles, and roles of leadership; development of leadership techniques and skills required in working with organizations and youth groups, methods of resolving conflict, of communicating, of guiding and evaluating; ethical considerations for leaders. Prereq:
Agricultural Economics

(College of Agricultural Sciences and Natural Resources)

MAJOR

DEGREES

Agricultural Economics ............................. M.S.

D. L. McLemore, Head

Professors:
Badenhop, M. B. (Emeritus), Ph.D. ....... Purdue
Brooker, J. R. (Liaison), Ph.D. ............ Florida
Cleland, C. L. (Emeritus), Ph.D. ......... Wisconsin
Cross, T. L., Ph.D. ........................... Oregon State
Eastwood, D. B., Ph.D. ..................... Tufts
English, B. C. Ph.D. ........................ Iowa State
Garland, D. C., Ph.D. ........................ Pennsylvania
Gerloff, D. G., Ph.D. ........................ Texas A&M
Hall, Charles R., Ph.D. ...................... Mississippi State
Jensen, K. L., Ph.D. .......................... Oklahoma State
Keller, L. H. (Emeritus), Ph.D. .......... Kentucky
Klindt, T. H., Ph.D. .......................... Kentucky
Leuthold, F. O. (Emeritus), Ph.D. ....... Wisconsin
McLemore, D. L., Ph.D. .................... Clemson
McManus, B. R. (Emeritus), Ph.D. ..... Purdue
Martin, J. A. (Emeritus), Ph.D. ......... Minnesota
Mundy, S. D. (Emeritus), Ph.D. ......... Tennessee
Or, R. H., Ph.D. ............................. Illinois
Park, W. M., Ph.D. ........................... Virginia Tech
Pentecost, B. H. (Emeritus), J.D. ....... Tennessee
Rawls, E. L. Ph.D. ............................ Virginia Tech
Ray, D. E. (Blasingame Chair of Excellence), Ph.D. .......................... Iowa State
Riley, J. B., Ph.D. ............................ Oklahoma State
Roberts, R. K., Ph.D. ........................ Iowa State
Smith, G. F., Ph.D. .......................... Tennessee
Whaley, T. J. (Emeritus), Ph.D. ......... Purdue

Associate Professors:
Barefield, D. A., Ph.D. ........................ Texas A&M
Barlow, J. A., Ph.D. ............................. Oklahoma State
Yen, Steven T., Ph.D. .......................... Minnesota

Assistant Professors:
Bazen, Ernest F., Ph.D. ........................ Kentucky
Clark, Christopher D., Ph.D. .......... Vanderbuilt
De La Torre Ugarte, D. G., Ph.D. .............................. Oklahoma State

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, kinds and sources of agricultural credit, and financial intermediation. Prereq. 212 The Agribusiness Firm and Economics 201 Introductory Economics. F

420 International Agricultural Trade and Marketing (3) Real and monetary aspects of international trade analysis; the agriculture system; partial market models; equilibrium analysis of international trade in agricultural products; institutional aspects of international marketing of agricultural products. Prereq. Intermediate Agricultural Economics or consent of instructor. Sp

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. F

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 cost structure 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 agribusiness industry; 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 public policy tools for influencing natural resource use; improving environmental quality. Prereq. Introductory Economics. Sp

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

502 Registration for Use of Facilities (1-15) 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

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 methods 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 applied considerations of each technique with emphasis on applications. Computer and other applications of each technique for relevant agribusiness problems. Prereq. Basic Calculus and 524. Sp

530 Agricultural Policy Analysis (3) Evaluation of public policy 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 in food and fiber markets; competitive environment. Profitability analysis of marketing 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; applied 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 experience with 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 structure and function of rural life in U.S. and developing countries. Demographic changes, rural social and community indicators, and rural development processes. Prereq: 380 or equivalent. (Same as Sociology 580.) Sp

593 Special Topics in Rural Sociology (1-3) Current sociological issues involving application of sociological theory. Prereq: 380 or consent of instructor. May be repeated. Maximum 6 hrs. E

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 507.) S/NC only. 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 DEGREES

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

Kelly Robbins, Head

Professors:

Barth, K. M. (Emeritus), Ph.D. ............... Rutgers
Beil, M. C. (Emeritus), Ph.D. ............... Oklahoma State
Bleter, J. K. (Emeritus), Ph.D. ............... Ohio State

Chamberlain, C. C. (Emeritus), Ph.D. ............... Iowa State
Conatser, G. E., M.S. ......................... Kentucky
Erickson, B. H. (Emeritus), Ph.D.Kansas State
Gill, W. W., Ph.D. ......................... Kentucky
Goan, H. C., Ph.D. ......................... Michigan State
Godkin, J. D., Ph.D. ......................... Massachusetts
Hall, O. G. (Emeritus), Ph.D. ............. Iowa State
Katteshe, H. G., Ph.D. ....................... VPI
Kirkpatrick, F. D., Ph.D. ...................... Tennessee
Lane, C. D., Ph.D. ......................... Tennessee
Liddall, E. R. (Emeritus), M.S. .............. Tennessee
Masincup, F. B. (Emeritus), Ph.D. ............ Tennessee

McDonald, T. P. (Emeritus), Ph.D. .............. Tennessee
McLaren, J. B. (Emeritus), Ph.D. ............... Auburn
Meadows, D. G., Ph.D. ....................... Texas A&M
Miller, J. K. (Emeritus), Ph.D. ............... Georgia
Montgomery, M. J. (Emeritus), Ph.D. ............ Wisconsin
Murphree, R. L. (Emeritus), Ph.D. ............ Wisconsin
Neel, J. B., Ph.D. ......................... Tennessee
Oliver, S. P., Ph.D. ......................... Ohio State
Richardson, D. O. (Emeritus), Ph.D.Ohio State
Robbins, K. R., Ph.D. ....................... Illinois
Rogers, Gary W., Ph.D. ....................... NC State
Saxton, A. Ph.D. ......................... NC State
Shirley, H. V. (Emeritus), Ph.D. ............... Illinois
Tugwell, R. L. (Emeritus), Ph.D. ............... Kansas State

Assocate Professors:

Grizzle, J. M., Ph.D. ....................... Florida
Harper, F. Ph.D. ......................... Rutgers
Heitmann, R. N., Ph.D. ....................... Maine
Mathew, A. G. (Liaison), Ph.D. ............ Purdue
Schrick, F. N., Ph.D. ....................... Clemson
Smith, M. O., Ph.D. ....................... Oklahoma State
Stalder, Kenneth J., Ph.D. ............... Iowa State
Wallner, J. C., Ph.D. ....................... Nebraska

Assistant Professors:

Edwards, J. L., Ph.D. ....................... Florida
Pighetti, G., Ph.D. ....................... Penn State
Richards, C. J., Ph.D. ....................... Kentucky

The Department of Animal Science offers graduate programs leading to the Master of Science and Doctor of Philosophy with a major in Animal Science. At the M.S. level, areas of concentration are animal genetics, animal health and well-being, animal management, animal nutrition, and animal physiology with orientation towards beef cattle, dairy cattle, swine, and poultry. The Ph.D. program offers areas of emphasis in animal genetics, animal health and well-being, animal nutrition, and animal physiology. For specific information, contact the department head.

It is recommended that all first-year graduate students enroll in 507 and 509. All first- and second-year students are required to enroll in 596 each fall and each spring term.

THE MASTER’S PROGRAM

For admission to the M.S. program, a student must have obtained a 3.0 grade-point average on a 4.0 scale (or a 3.0 each term during the junior and senior years) in a completed undergraduate degree program in one of the animal sciences or in a related area. The student must submit evidence (letters of recommendation, personal interview, etc.) that indicates ability to complete requirements for the M.S. Prerequisite courses may be required if the student has insufficient undergraduate background. If the student has an unsatisfactory grade-point average, acceptance may be on a probationary (non-degree) basis and a minimum of 9 hours of graduate coursework must be completed the first term with a minimum grade-point average of 3.0 for admission to the M.S. program.

The program requires the writing of a thesis based on original research; the completion of a minimum of 24 hours of graduate coursework, of which at least 14 hours must be taken in courses numbered at or above the 500 level; and 6 hours of thesis. Included in the course requirement are 1 hour of Agriculture 512 and a minimum of 3 hours in statistics. These statistics courses must be chosen from the 400, 500, or 600 level of courses approved for use in the Intercollegiate Graduate Statistical Program (ICGSP). The remainder of the coursework will be selected jointly by the student and the major professor depending on the student’s area of concentration and professional objectives.

The advisory committee will consist of the major professor, a faculty member of Animal 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 program 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
concludes 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 theriogenology. Prereq: 320 or equivalent. 1 hr and 2 labs. F.


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 growth and nutrient requirements; interrelationships, availability and efficiency of nutrients. Prereq: Animal Nutrition, Feeds, and Ration Formulation or consent of instructor. F

535 Ruminology (2) Anatomy, physiology, and microbiology of rumen ecosystem: microbial fermentation and metabolism of polysaccharides, lipids and nitrogen. Prereq: 530 or consent of instructor. Sp

551 Mammalian Organology (3) Microscopic study of structures 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 2 labs. 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 for micro- or mainframe computer. (Same as Plant and Soil Sciences 571.) Sp

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

596 Seminar (1) Advanced topics in animal science. Required of all first- and second-year MS students. May be repeated. Maximum 2 hrs. 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, current problems. May be repeated. Maximum 6 hrs. E

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

633 Advanced Mineral-Vitamin Nutrition (4) Chemical forms, digestion, absorption, intermediary metabolism, deficiencies, excesses and interactions of minerals and vitamins. Prereq: 533 or 534, and Biochemistry and Cellular and Molecular Biology 410 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 evaluation. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. (Same as Comparative and Experimental Medicine—Veterinary Medicine 851.) 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

681 Advanced Topics in Animal Health and Well-Being (1-4) Recent advances and concepts, research techniques, and current problems associated with animal health and behavior. May be repeated. Maximum 6 hrs.

696 Seminar (1) Advanced topics in animal science. Required of all first- and second-year Ph.D. students. May be repeated. Maximum 2 hrs. Sp

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**Anthropology**

**MAJOR DEGREES**

Anthropology ..................................... M.A., Ph.D.

Andrew Kramer, Head

Professors:

- Bass, William M. (Emeritus), Ph.D. ........................................ Pennsylvania
- Faulkner, Charles H., Ph.D. ........................................ Indiana
- Harrison, Faye V., Ph.D. ........................................ Stanford
- Howell, Benita J., Ph.D. ........................................ Kentucky
- Jantz, Richard L., Ph.D. ........................................ Kansas
- Kippel, Walter E., Ph.D. ........................................ Missouri
- Konigsberg, Lyle, Ph.D. ........................................ Northwestern
- Logan, Michael H., Ph.D. ........................................ Penn State
- Parmalee, Paul W. (Emeritus), Ph.D. ........................................ Yale

Associate Professors:

- Kramer, Andrew (Liaison), Ph.D. ........................................ Michigan
- Marks, Murray K., Ph.D. ........................................ Tennessee

Assistant Professors:

- Ferrer, Mariana, Ph.D. ........................................ California
- Qirko, Hector N., Ph.D. ........................................ Tennessee

Research Associate Professor:

- Chapman, J., Ph.D. ........................................ North Carolina

Research Assistant Professors:

- Elam, J. Michael, Ph.D. ........................................ Missouri
- Frankenberg, S. (Curator), Ph.D. ........................................ Northwestern

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 brochure 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 formal application to The University of Tennessee Graduate Admissions. Copies of the application form, transcripts, and GRE scores that are sent to Graduate Admissions should also be sent directly to the Department of Anthropology at the same time. In addition, the application requires a letter of intent from the applicant indicating career goals and reasons for selecting the University of Tennessee, three letters of recommendation, and one sample of the prospective student’s written work (a class paper or research report). These materials should be sent directly to the Graduate Secretary, Department of Anthropology, SSH 250, University of Tennessee, 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 30 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 Method and Theory 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. The concentrations should be 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 graduation seminar 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 graduate-level introductory statistics course, usually Statistics 537.

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 second semester of the second year.

8. Two copies of the thesis are required by the Office of Graduate Student Services. 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 Council requirements, requirements for the Ph.D. degree with a major 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 the following 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 communicate directly with the potential chairperson and two additional members of the anthropology faculty who will be asked to serve on the committee.

Applicants 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, 560, 590) and pass the Graduate Council 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 reached agreement on the specific fields of specialized competence over which the student will be examined, a brief delineation of the fields by the student, approved by the members of the committee, is presented to the department head and the student’s major professor. As early as possible, but no later than a full semester after admission to candidacy, the student shall formally present a written dissertation proposal to the department head and advisor.

Residence and Coursework: Every potential Ph.D. candidate must complete two consecutive semesters of full-time residence prior to taking the doctoral comprehensive examination. The student must complete the minimum coursework requirements of the Graduate Council, 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. Outside coursework may 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 is normally 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 Examinations: Students must successfully complete a written and oral comprehensive exam.

1. Comprehensive Written Examination: When the Ph.D. aspirant has completed all of the foregoing requirements and is judged by the committee to be prepared in the field(s) of concentration, the aspirant 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 follows shortly after successful completion of the comprehensive written exam. The major professor acts as chairperson of the committee.

Admission to Candidacy: Upon successful completion of the comprehensive exam and with the formal approval of the Dean of Graduate Studies, the student is admitted to candidacy for the Ph.D. degree. The formal dissertation prospectus must be filed no later than one full semester after advancement to candidacy.

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 a 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 UT on an in-state tuition basis. The M.A. program in Anthropology is available to residents of the states of Delaware, Georgia, 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 may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

Graduate Courses

410 Principles of Cultural Anthropology (3) Exploration and illustration of major concepts, theories, and methods in cultural anthropology, with application to analysis of specific ethnographic cases. Prereq: 130 Cultural Anthropology.

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

412 Folklore in Anthropology (3) Introduction to anthropological study of folklore, using folklore and folk material from various tribal, peasant, and complex societies. Prereq: 130 Cultural Anthropology 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 anthropological ethnographic, and contemporary case studies. Prereq: 130 Cultural Anthropology or consent of instructor.

414 Political Anthropology (3) Organization and dynamics of power and politics in both stateless and state-level societies. Comparative analysis of traditional political forms and systems within modern states. Prereq: 130 Cultural Anthropology or consent of instructor.

416 Applied Anthropology (3) Introduction to principles, practice, and ethics of anthropology applied to practical problems in non-academic settings. Overview of career opportunities in various domains of applied anthropology. Prereq: 130 Cultural Anthropology or consent of instructor.

431 Ethnographic Research (3) Conceptual and practical exploration of methods and techniques of cultural anthropologists used in fieldwork. Prereq: 130 Cultural Anthropology or consent of instructor.

435 Historical Archaeology Laboratory (3) Laboratory procedures for processing, identification, and interpretation of artifacts from historical sites. Artifacts 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 day cultures and their environments: ecological theory, methods of analysis, and review of selected case studies. Prereq: 120, 130, 410, or consent of instructor.

442 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.

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

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

445 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 skeleton. Prereq: 110 or consent of instructor; 3 hrs and 1 lab.

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

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

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


494 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) P/NP only. E

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

502 Registration for Use of Facilities (1-15) Required for the student to engage in research 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

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

511 Special Topics in Cultural Anthropology (3) Seminars for advanced students on topics of special interest: ethnomedicine, 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 research urban communities; urban problems and applied anthropology.

514 Anthropology of Development (3) Application of anthropological theory, methods, and findings to community and national development programs. Analysis of anthropologists' roles, values, 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, class, status, economic inequality, and sex. Prereq: Consent of instructor.

520 Seminar in Zoarchaeology (3) Approaches to analysis and interpretation of archaeological fauna. Intensive reading; evaluation and discussion of major faunal studies, guides to identification, methods of presenting faunal data. May be repeated. Maximum 6 hrs.

521 Laboratory Studies in Zoarchaeology (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 characters of species encountered in archaeological use of comparative collections. May be repeated. Maximum 9 hrs.

522 Seminar in Archaeology (3) Theoretical and practical issues in contemporary archaeology: ethnoarchaeological, paleoethnobotany, 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, preserving, sourcing, and analysis of archaeological data. Prereq: Consent of instructor. Many 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, archaeological formation processes, and methods of analysis and interpretation. May be repeated. Maximum 6 hrs.

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 and interpreting stone tools in planar and fragmentary form. Lithic tool production, use, stylistic variability, and discard processes.

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

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


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

585 Laboratory Studies in Biological Anthropology (3) Conceptual coverage of laboratory methods in biological anthropology. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

Anthropology
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) P/ NP only.

601 Advanced Graduate Research (1-6) 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 Advanced Seminar in Cultural Anthropology (3) Critical evaluation of current issues in theory and data interpretation. May be repeated. Maximum 6 hrs.

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

690 Selected Topics in Physical Anthropology (3) For doctoral students in biological anthropology. May be repeated. Maximum 6 hrs.

691 Selected Topics in Paleoenthropology (3) May be repeated. Maximum 6 hrs.

695 Gross Human Anatomy (9) Skeleton, muscles, and cardiovascular system. Dissection of cadavers. Prereq: 480 or Human Biology. 5 hrs and 5 labs.

Architecture

(College of Architecture and Design)

MAJOR DEGREE
Architecture ...................... M.Arch.

Professors:
Conley, G. (Emeritus), B.Arch. ............... Harvard
Davis, Marleen, M.Arch. ...................... Harvard
Kaplan, M. (Emeritus), M.Arch. ............. Harvard
Kelso, R. M., M.S. (Arch.) .................... Tennessee
Lauer, W. J. (Emeritus), Ph.D. ............... SUNY (Buffalo)
M.S.Arch. Engr. ......................... Iowa State
Watson, J. S., M.Arch. ....................... Pennsylvania
Lison, P., Ph.D. ............................... Virginia
Moffett, M. S., Ph.D. ........................ MIT
Rabun, J. S., M.A. .............................. Texas
Robinson, M. A., M.Arch. ................... Pennsylvania
Rudd, J. W. (Emeritus), M.A. .... Northwestern
Shell, W. S., M.S.Arch. ........................ Columbia
Watson, J. S., M.Arch. ....................... Pennsylvania

Associate Professors:
Coddington, J., M.Arch. ....................... Pennsylvania
Davis, T. K., M.Arch. ........................ Cornell
Debissel, C., M.Arch. ......................... Harvard
Drisin, A., MdesS. .............................. Harvard
Fox, L. D., M.Arch. ........................... Cranbrook
Martella, W. E., B.Arch. ................... California
Moir-McCleen, T. W., M.Arch. ............ Michigan
Schimmenti, M. M., M.Arch. ............... Florida

Assistant Professors:
Altwicker, M., B.Arch. ............... PFI
DeKay, M., M.Arch. ........................ Oregon
Dodds, G., Ph.D. .............................. Pennsylvania
Frenck, C. G., M.Arch. ...................... Tennessee
Klinkhammer, B., M.Arch. .... RWTH (Aachen)
Stach, E., IPMA .............................. Bauhaus
Thurlow, A., M.Arch. ........................ Columbia
Ware, S. M., M.F.A. ........................ Tennessee

MASTER OF ARCHITECTURE PROGRAM

The School of Architecture offers two tracks leading to the Master of Architecture degree. Track 1 is for students seeking the first-professional degree who already hold a Bachelor's degree or an advanced degree in another field. Track 2 is for students with an accredited first-professional degree who seek to develop an area of specialization. Contact the Graduate Program Head for additional information.

Admission Requirements

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

For Track 1 applicants, a bachelor's degree with a 3.0 GPA from an accredited college or university is required. International applicants must have an equivalent 4-year degree and 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, systems 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 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 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.

Degree Requirements

Track 1 requires a minimum of 48 semester hours of undergraduate preparation and 60 semester hours of graduate coursework, taking approximately 3 ½ 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. 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.

For further information, contact the School of Architecture.

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.Arch. program in Architecture is available to residents of the states of Arkansas, Delaware, Kentucky, Mississippi, or West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE COURSES

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

404 Preservation Technology (3) Techniques of preservation: methods of analysis, history of materials and technology used in old buildings. Prereq: 403.

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 throughout 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 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 research using primary material.

414 History of Architectural Technology (3) Building materials and construction techniques from antiquity to present.

415 Medieval Architecture (3) History of architecture from decline of Rome to 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 theoretical basis for design throughout history. Selected examples of landscape architecture analyzed in terms of design.
422 Modern European Architecture (3) Twentieth century architecture in Russia, Czechoslovakia, Poland, Hungary, East Germany, Romania, Bulgaria, Yugoslavia.

425 Special Topics in Architecture (1-6) Faculty initiated courses on topics consistent with the interests of faculty. 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-aided architectural 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. 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 features. Architectural program analysis of external and internal load dominated buildings. Prereq: 341.

444 Advanced Environmental Control Systems (3) In-depth analysis of building systems. Prereq: 341.

445 Advanced Lighting (3) In-depth analysis and innovative concepts in design of lighting. Prereq: 342.

463 Architectural Development (3) Principles and practice of architect as developer. Impact of economics, finance and urban policy on design and development of real estate. Open to all students.

473 Architectural Photography (3) Photography as design, research, and presentation medium. Application of photographic techniques, printing and processing. Color and black-and-white.

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

502 Registration for Use of Facilities (1-15) 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

503 Modern Architecture: Histories and Theories (3) History and theory of modern architecture: late 19th and 20th centuries through broad-based examinations of question of modernity and specific case studies of buildings, periods, and theories.

504 Issues in Preservation (3) Architectural issues: preservation, restoration and conservation of historic structures. Prereq: Consent of instructor.

507 Architecture, Culture and Modernity (3) Scope of ideas generated in architecture's recent history to reveal and explain production and reception of architecture: historical background necessary to understand those concepts. Complements history sequence but in specialized field of theory.

509 Seminar in Architectural Technology (3) Technological aspects influencing building form. Role of technical aspects of structural, environmental and building infrastructure as integrated systems supporting access use and expression of building.

511 Environmental Influences (3) Environmental factors which influence regional character of architecture. Natural forces associated with these factors, cultural interpretation and response regarding importance and impact.

513 Cultural Aesthetics (3) Principles underlying cultural character of architecture. Role of social, political and economic forces which influence interpretation of factors creating building's character.

514 Seminar in Ethical Imperatives (3) Social, cultural, philosophical and moral issues which impact professional responsibilities. Attitudes, values, and ideas that address formation of profession’s ethos.

515 Seminar in Issues in Urban Design (3) Investigations of urban forms, patterns, and attitudes that have shaped towns and cities. Prereq: Consent of instructor.

516 Materials and Methods of Construction (3) Properties of interior and exterior building materials and their relation to construction methods and detailing. Theory of materials selection and application and role materials and methods play in design process.

521 Principles of Architectural Form (3) Historical and contemporary architectural theory through investigation of literature and related examples. Theories of understanding and theories of application related to generation of architectural form and space in response to both cultural and environmental focus.

525 Special Topics in Architecture (1-3) Student- or instructor-initiated course. May be repeated. Maximum 9 hrs. S/N/C or letter grade.

526 Directed Readings in Architecture (3) Readings on topics of interest: primary texts, history, theory, urban issues, technology and professional practice. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

528 Topics in Architectural History and Theory (3) Historic topics, ideas and theories in architecture. Prereq: Consent of instructor.

532 Computer Applications for Architecture (3) Advanced use of computers in architecture. Prereq: Consent of instructor.

551 Research Methods (3) Qualitative and quantitative research methods in architectural inquiry. Systematic study and application of applied and speculative investigations in field of architectural research. Prereq: Identification of techniques and methodologies and applications for architectural research and scholarship.

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 design services: assessment of building industry impact 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

DEGREE

Art

M.F.A. ............................................. M.F.A.

Jan F. Simik, Interim Director

Professors:

B lain, Sandra J., M.F.A. .......... Wisconsin
Brakke, P. M., M.F.A. .............. Yale
Darrow, J. F. (Emeritus), Ed.D. .... Illinois State
Falsetti, Joseph S. (Emeritus), M.S. Ohio State
Goldenstein, M. B., M.F.A. ........ Nebraska
Habel, Dorothy, Ph.D. .............. Michigan
Kennedy, William C. (Emeritus), M.F.A. .......... Wisconsin
Lee, B., M.F.A. ............................ Yale
Leland, W. E., M.F.A. .............. Tennessee
Livingston, P. R. (Emeritus), M.F.A. Wisconsin
Lyons, B. (Liaison), M.F.A. ....... Arizona State
Magden, Norman, Ph.D. ............. Case Western Reserve
Martinson, Fred (Emeritus), Ph.D. ...... Chicago
Moffatt, F., Ph.D. ................. Chicago
Peacock, D. (Emeritus), M.F.A. .......... Iowa
Riesing, T. J., M.F.A. ............... Nebraska
Staples, Carolyn, M.F.A. .......... Michigan State
Stewart, F.C., M.F.A. ................. Claremont
Wilson, D., M.F.A. ................. California (San Diego)
Yates, S., M.F.A. ......................... North Carolina (Greensboro)

Associate Professors:

Brogden, Sally B., M.F.A. ........... NY College of Ceramics (Alfred)
Hiles, Timothy, Ph.D. .............. Penn State
Nett, A., Ph.D. ............................ Pennsylvania

Assistant Professors:

Brown, Jason, M.F.A. ............... Rhode Island School of Design
Jung, A., M.F.A. ............................. Wisconsin
Lough, Wade, M.F.A. .............. Temple
Lowe, Sara, M.G.D. ................. NC State
Martin, Frank, M.F.A. .............. Cranbrook Academy Odem, Jennifer, M.F.A. ........... Florida State
Wright, S. E., Ph.D. ................. Stanford

The Master of Fine Arts is the terminal degree in studio art. It is offered in the concentration areas of ceramics, graphic design, drawing, media arts, painting, printmaking, sculpture, and watercolor. Inter-area studies are available with consent of the faculty.

THE MASTER’S PROGRAM

To become a candidate, the applicant must be admitted by the Office of Graduate Admissions and approved by the School of Art. In addition to the minimum admission requirements, the School of Art specifically requires the following:

1. A detailed letter of intent including statement requesting assistance, if desired.

2. Three letters of recommendation from former professors or professionals in the field.

3. An undergraduate major in art or evidence of equivalent proficiency.
The M.F.A. program in Art is available to residents of some states to enroll in certain ACADEMIC COMMON MARKET dismissal. specific goals set for a specific time, or Projects in Lieu of Thesis.

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 register for Projects in Lieu of Thesis.

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 advance- ment 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 Kentucky or South Carolina (concentration in graphic design only). Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE MINOR IN THE HISTORY OF ART

A graduate minor in Art History may be arranged during the student's first semester of study with the consent of the student's area instructors and the Art History faculty. Students must complete a minimum of 12 hours in Art History that is agreed upon by the Art History faculty after review of previous undergraduate coursework. A reading knowledge of French, German, or Italian is a prerequisite, unless waived by the Art History faculty. Graduate Council policy stipulates that a member from the minor unit must serve on the thesis committee.

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, storage and shipping. Prereq: 481 or consent of instructor. (Same as Anthropology 482.)

484 MUSEOLOGY III: Field Projects (1-12) Special field projects: restoration, preservation, registration, and related research on relevant 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 the convenience of department. May be repeated. Maximum 12 hrs.

502 REGISTRATION FOR USE OF FACILITIES (1-15) 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 of development of skills, methods and methodology in teaching studio courses. For students who are not GTA's. Prereq: Consents 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


429 CERAMICS: SPECIAL TOPICS (3) Student- or instructor-initiated course offered at the 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.

525 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 History

GRADUATE COURSES

403 History of Photography (3) Survey of history of photography from introduction of daguerreotype and calotype to most recent trends. Aesthetics and use of photography as medium for artistic expression.

411 Art of South and Southeast Asia (3) Survey of art and architecture of Indian subcontinent and South- east Asia from 2000 B.C. to 20th century. Major achievements of each period in religious, political, and social contexts.

415 Art of China (3) Survey of art and architecture of China from neolithic period to 20th century. Major achievements of each period in religious, political, and social contexts.

419 Art of Japan (3) Survey of art and architecture of Japan from neolithic period to 20th century. Major achievements of each period in religious, political, and social contexts.

425 Early Christian and Byzantine Art to 1350 (3) Art in Italy and the Eastern Empire from the beginnings of Christian art to c. 1350. Mosaic and painting, sculpture and architecture. Writing-emphasis course. (Same as Judaic Studies 425.)

431 Medieval Art of the West, 400-1400 (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) From courtly art of late Middle Ages to Northern Renaissance. Jan van Eyck, Roger van der Weyden, and Durer; early printmakers. Writing-emphasis course.

442 Art of Northern Europe, 1600-1675 (3) Concen- trated study of Bruegel, Rubens, Rembrandt, Georges de la Tour, Vermeer, Poussin, and Hals. Writing- emphasis course.


453 Art of Southern Europe, 1575-1700 (3) Concen- trated study of Caravaggio, Bernini, and Italian Baroque developments in all media. Spanish Baroque painting and sculpture; Velasquez. Writing-emphasis course.

454 Renaissance and Baroque Theory (3) Theory of Western art in early modern period: development and evolution in European Art during Renaissance and Baroque periods. Prereq: 172 and 173 Western Art, or consent of instructor.

461 Art of Southern and Eastern Africa (3) Art traditions of eastern and southern regions of Africa. Sculpture, painting, pottery, textiles, architecture and human adornment. Some ancient Stone and Iron Age traditions. Diverse ethnic and regional art traditions practiced in area from 19th century to present.

462 Art and Archaeology of Ancient Africa (3) Historical art traditions of sub-Saharan Africa. Prehis- toric rock paintings; art from archaeological sites and ancient kingdoms. First and second millennia B.C. for early terracotta sculpture and rock paintings, 11th through 19th centuries A.D. for later ancient kingdoms.

463 Arts of the African Diaspora (3) Aesthetic, philosophical and religious patterns of African descen- dants of Brazil, Surinam, Caribbean and United States. Full range of art forms: sculptural and performance traditions, architecture, textile, basketry and pottery art forms.

471 History of North American Art (3) Landmarks in painting, architecture, sculpture, and design from prehistory to 1900.

472 History of 20th-Century American Art (3) Devel- opments 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.


476 History of 20th-Century Painting and Sculp- ture in Europe (3) Development of Modern and Post- Modern movements in Europe. Investigation of pro- gression of abstraction through more recent concep- tual trends. Analysis of work of individual artists such as Picasso, Matisse, and others.

479 Special Topics in Art History (3) Student- or instructor-initiated course offered at convenience of department. May be repeated. Maximum 12 hrs.

483 History of American Sculpture (3) American sculpture from prehistory to 1960’s.

485 History of Printmaking (3) Prints from 15th century to present. 20th century in Europe and U.S. Prereq: 172 and 173.


571 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 depart- ment. Maximum 6 hrs.

572 Studies in Italian Renaissance Art (3) Art and architecture of 14th, 15th, and/or 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.

573 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.

574 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.

575 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.

576 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.

579 Special Topics in Art History (3) Student- or instructor-initiated course offered at convenience of department. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of depart- ment. Maximum 9 hrs.

Art Media Arts

GRADUATE COURSES


433 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.)

435 Cinematography as Art (3) Continued develop- ment of concepts and techniques for creation of films 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.

436 Video Art (3) Continued development of concepts and techniques for creation of video works as art form: individual projects. Prereq: Introduction to Cinematog- raphy as Art and Media Arts Portfolio Review or consent of instructor. May be repeated. Maximum 9 hrs.

439 Special Topics in Media Arts (3) Student- or instructor-initiated course offered at convenience of department. May be repeated. Maximum 12 hrs.

441 Digital Photography II (4) Continued exhibition of use of large format digital photography. Prereq: Large Format Photog- raphy 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 Visiting Artist Seminar (3) Contemporary art issues by different visiting artists. May not be 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 and personal expression with varied media. Prereq: Painting III. May be repeated. Maximum 12 hrs.

415 Watercolor IV (6) Advanced painting with water- based media on paper, individual concepts and per-
sonal approaches. Prereq: Watercolor III. 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.

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.

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 image and personal concept. Prereq: Intermediate Screen Printing or consent of instructor. May be repeated. Maximum 12 hrs.

469 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.

561 Printmaking I (2-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. Prereq: 561. May be repeated. Maximum 10 hrs.

562 Printmaking II (2-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. Prereq: 561. 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. Prereq: 561, 562.

564 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/NC only.

Art Sculpture

GRADUATE COURSES

441 Advanced Sculpture (3-6) Individual development of sculptural problems and techniques. Prereq: 6 hrs of 300 level sculpture. May be repeated. Maximum 12 hrs.

449 Special Topics in Sculpture (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Successful completion of any portfolio review. May be repeated. Maximum 12 hrs.

541 Graduate Sculpture I (2-6) May be repeated. Maximum 10 hrs.

542 Graduate Sculpture 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.

Arrowmont

GRADUATE COURSES

Courses listed below offered periodically only at the Pi Beta Phi Arrowmont School of Crafts, Gatlinburg, Tennessee. Courses may be repeated. Upon admission to the M.F.A. program at UT, a student may apply certain graduate courses taken at Arrowmont toward the degree, subject to the approval of the student’s graduate committee.

400 Special Topics (2-4) Student- or instructor-initiated course offered at convenience of department. May be repeated.

410 Drawing (2-4) Intermediate to advanced. May be repeated.

420 Ceramics (2-4) Intermediate to advanced. May be repeated.

430 Photography (2-4) Intermediate to advanced. May be repeated.

440 Painting (2-4) Intermediate to advanced. May be repeated.

450 Metal Design (2-4) Intermediate to advanced. May be repeated.

460 Fiber (2-4) Intermediate to advanced. May be repeated.

470 Fabric (2-4) Intermediate to advanced. May be repeated.

480 Enameling (2-4) Intermediate to advanced. May be repeated.

490 Wood (2-4) Intermediate to advanced. May be repeated.

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.

Ilsa Schwarz, 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

Petersen, H. A. (Emeritus), Ph.D. .... Illinois

Schwarz, Ilsa, Ph.D. ......................... Oregon

Silverstein, B. (Emeritus), Ph.D. .......... Purdue

Associate Professors:

Burchfield, Samuel B., Ph.D. .... Michigan State

Hedrick, Mark, Ph.D. ...................... Vanderbilt

Payne, Pearl A., Ph.D. ...................... Tennessee

Swanson, Lori A., Ph.D. ................. Purdue

Thelin, J. W., Ph.D. ...................... Iowa

Assistant Professors:

Erickson, Mary L., Ph.D. ........... Southern Cal

Flipsen, Peter, Ph.D. ................. Wisconsin

Harkrider, Ashley, Ph.D. ........... Texas

Clinical Director:

Michael, Ann, Ph.D. ...................... Vanderbilt

Clinical Faculty:

Barnes, Vickie, M.A. .................... Tennessee

Beeler, Julie, M.A. .................... Tennessee

Buehler, Velvet, M.A. ............... Tennessee

Christopher, Kimberly, M.A. .... Tennessee

DeGennaro, Andrea, M.A. .......... Case Western

Dungan, Jan, M.A. ....................... Tennessee

Edick, Lisa, M.A. ...................... Texas

Genone, Laura, M.A. ................. Tennessee

Hume, Sue, Ph.D. ...................... Tennessee

Hutsell, Gayla, M.A. .................. Tennessee

Jenkins, Kimberly, M.A. .......... Tennessee

Johnston, Kristi, M.A. ............... Tennessee

Lewis, Dee, M.A. ...................... Tennessee

Lytte, Susan, M.A. ................... Tennessee

Powell, Pam, M.A. ..................... Tennessee

Schay, Nancy, M.A. ................. Tennessee

Searfoss, Marianne, M.A. ............. Tennessee

Sheridan, Carol, M.A. ............... Tennessee

Simpson, Leigh, M.A. .............. Tennessee

Singletary, Theronne, M.S. ...... Colorado State

Thomason, Tanya, M.A. .......... Tennessee

Valentine, Dan, M.A. ............... Tennessee

Vaught, Teresa, M.S. ............. Eastern Kentucky

Ward, Tracey, M.S. ............. East Tennessee State

Webb, Patricia, M.Ed. ................. Florida

Yeager, Kelly, B.S. ...................... South Alabama

Effective Fall 2003, the Doctor of Audiology (Au.D) with a major in Audiology will be offered. At that time the Master of Arts degree program with a major in Audiology will be terminated. Contact the department for complete details.
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, 539 or 541, 520 or 524, and at least two seminars from the following courses: 522, 523, 525, 539 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/phonology, clinical 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 a minimum of 6 semester hours in 511 and 15 additional semester hours in 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, 539 or 541, 520 or 524, and at least two seminars from the following courses: 522, 523, 525, 539 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/phonology, clinical 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 a minimum of 6 semester hours in 511 and 15 additional semester hours in 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 DOCTORAL PROGRAM

The Ph.D. program in Speech and Hearing Science seeks to develop individuals for professional careers in a variety of positions including clinical teaching, research 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 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:
   a. a minimum of 6 semester hours in each of the concentration areas of speech, language science or hearing science.
   b. a minimum of 6 semester hours in the topic(s) of related 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 South Carolina. The Ph.D. program in Speech and Hearing Science is available to residents of the states of Arkansas or Delaware. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE COURSES

431 Stuttering (3) Nature, appraisal and treatment. Prereq: 300 Introduction to Communication Disorders or consent of instructor.
433 Observation of Clinical Practice (1) Prereq: 320 Speech and Language Development or consent of instructor.
434 Clinical Practice in Speech-Language Pathology II (1-4) Prereq: 433 and consent of instructor.

Enrollment for fewer than 2 hrs must have prior departmental approval.

435 Introduction to Speech Sound Disorders (3) Etiology, diagnosis, and treatment of articulatory and phonological disorders. Prereq: 300 Introduction to Communication Disorders, 305 Phonetics, or consent of instructor.
440 Voice Disorders (3) Etiology, diagnosis, and treatment of organic and functional voice disorders. Prereq: 300 Introduction to Communication Disorders, 305 Anatomy and Physiology of Speech, or consent of instructor.
455 Problems in Speech Pathology (1-3) Prereq: Consent of instructor.
461 Introduction to Language Pathology in Children (3) Nature, etiology and treatment of language related problems in children; language therapy. Prereq: 320 or consent of instructor.
473 Introduction to Audiolinguistic Assessment (3) Basic principles of clinical audiology; pure tone, speech, masking and overview of special auditory tests. Prereq: 303 Introduction to Hearing Science.
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: 305 Phonetics and 473 or equivalents or consent of instructor.
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (1-15) 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
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: 300 Introduction to Communication Disorders, 305 Phonetics, and 433 or equivalents or consent of instructor.
506 Neural Bases of Speech and Language (3) Structure and function of central and peripheral 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 processes. Prereq: 473 or equivalent or consent of instructor.
511 Introduction to Research in Speech and Hearing (3) Analysis of research techniques, fundamentals of statistical analysis, presentation of statistics, and completion of a proposal and hypothetical pilot research project.
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.
514 Practicum in Verbo-Tonal Habilitation (1-4) Prereq: 494, 506, 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, aphasic classification and terminology, tests and rationale for testing, etiology, therapy considerations and prognosis for recovery. Prereq: 506 or equivalent or consent of instructor.
522 Seminar in Articulation and Phonological Processing Disorders (3) Current research in diagnosis and management of articulation and phonological...
523 Seminar in Voice Disorders (3) Current research in diagnosis and management of voice disorders. Prereq: 440 or equivalent consent of instructor. May be repeated. Maximum 10 hrs.

524 Traumatic Brain Injury (3) Advanced neurogenetics: cognitive-linguistic emphasis. Medical and speech-language pathology rehabilitation issues associated with traumatic brain injury (TBI) related to adult TBI population. Prereq: 506 and 523, or consent of instructor.

526 Dysphagia (3) Clinical diagnosis, evaluation, and treatment of adult swallowing disorders and critical interpretation of research literature on dysphagia. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

527 Seminar on Stuttering (3) Current 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: 434 or equivalent and consent of instructor. 534 may be repeated. Maximum 6 hrs. Enrollment for less than 2 semester hrs must have prior departmental approval.

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 (1-4) Prereq: 517, 539, or consent of instructor. May be repeated. Maximum 6 hrs.


540 Structural Speech Disorders (3) Etiology, diagnosis and clinical management of craniofacial speech disorders and laryngectomy. Prereq: 506 Anatomy and Physiology of Speech and 435.

541 Pediatric Oromotor Disorders (3) Evaluation, diagnosis, and treatment of pediatric oromotor disabilities that affect normal acquisition of feeding and perespiration. Prereq: 506 or consent of instructor. May be repeated. Maximum 6 hrs.

542 Hearing Disorders (3) Effects of heredity, development/aging, diseases, and physical agents on hearing. Prereq: 473 or equivalent or consent of instructor.

543 Amplification Technology (3) Description of hearing aid circuits, components and performance characteristics. Electroacoustical and real-ear analysis of hearing aids. Coupler material and geometry effects. Practical experience in troubleshooting, repair, and construction of hearing aids. Prereq: 473 and 507 or equivalents or consent of instructor.


545 Sound Measurement Techniques and Hearing Conservation (3) Techniques of measurement and analysis of sound: hearing conservation in schools and industry. Prereq: Consent of instructor.

546 Advanced Audiology (3) Theoretical bases for behavioral audiology and acoustic immittance measurement. Prereq: 473 or equivalent or consent of instructor.

547 Special Problems in Audiology (1-3) Prereq: 473 or equivalent and consent of instructor. May be repeated. Maximum 12 hrs.

548 Special Study in Audiology (1-3) Special reading, consultation, and research activities in field of audiology. May be repeated. Maximum 6 hrs.

549 Hearing Science (3) Study of psychoacoustic phenomena and how they relate to perception and diagnostic audiology. Prereq: 473, 507, and 546 or equivalents or consent of instructor.

550 Seminar in Audiology (1-3) Significant research in various areas of audiology. Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.


555 Special Problems in Speech-Language Pathology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

556 Independent Study in Speech-Language Pathology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

558 Phonological Disorders (3) Current theories and approaches to assessment and intervention for individuals with difficulty acquiring or using speech sound system of English. Prereq: 435 or equivalent or consent of instructor.

561 Child Language Disorders (3) Current literature on assessment and intervention techniques for young language learners. Prereq: 461 or equivalent or consent of instructor.

565 Language Disorders: Birth to Three (3) Overview of family-focused, transdisciplinary intervention process. Assessment/treatment of infants, toddlers, and preschoolers. Description of disabilities and resulting communicative disorder. Prereq: 481 or equivalent or consent of instructor.

574 Pediatric Audiology (3) Theoretical and practical considerations in evaluation and treatment of hearing loss in infants and children. Audiological intervention and management of hearing impaired child; amplification, educational alternatives, and state and federal guidelines.

576 Electrophysiological Assessment of Auditory Function (3) Evoked potentials and their anatomical origin. Use of various evoked potentials in evaluation of auditory function and determination of site(s) of lesion. Prereq: 473, 507, and 546, or equivalents or consent of instructor.

577 Vestibular Disorders (3) Anatomy, physiology, and pathophysiology of vestibular system and other systems that contribute to balance. Practicum in electrostigmagraphy. Prereq: 507, 542, 546, and 576 or equivalents or consent of instructor.

578 Psycholinguistic Concepts in Speech Pathology (3) Psycholinguistic concepts and information theory in studying the normal acquisition of language and certain disorders of language. Prereq: Consent of instructor.

582 Speech and Language Services in School (3) Organization and implementation of speech and language programs in schools.

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 Advanced Aural Habilitation/Rehabilitation of the Hearing-Impaired (3) Study of grieving process; counseling, group and individual amplification systems, classroom/speech acoustics, central auditory problems, therapy methods for habilitation and rehabilitation, speech reading, school-based programs, programs for adults and the elderly; student research reports/case studies. Prereq: Phonetics and Acoustics of Speech, 473 and 494 or equivalents or consent of instructor.

595 The Verbotonal System: Auditory/Speech Perception (3) Innovative theory, therapy procedures, and SUVAG amplification filters for diagnosis/evaluation/remediation of spoken language/listening skills of hearing-impaired children/adults: use of rhythms, movements and suprasegments; special audiomotor tests, acoustic filters, correcting misarticulations through optimal listening; central auditory treatment; second (foreign) language through listening/spoken language; relationship of concepts/clinical concepts/practice; student research reports. Prereq: 305 Phonetics, 473, and 494 or equivalents or consent of instructor.

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

601 Experimental Phonetics (3) Acoustical and perceptual analyses of speech production and overall oral communication. Prereq: 517 or consent of instructor.

602 Psychoacoustics (3) Auditory perception and reception of nonspeech and speech stimuli. Prereq: 517.

607 Advanced Anatomy and Physiology of the Ear (3) Anatomical and physiological correlates in hearing, cochlear mechanical function, neurophysiological response and theoretical considerations. Prereq: 507.

609 Seminar in Speech Science (2) Experimental areas: speech physiology, acoustic analysis, recognition, perception and intelligibility of speech, communication theory, and psycholinguistic measurement of speech and language. Topics vary. Prereq: 601 or consent of instructor. May be repeated. Maximum 6 hrs.

610 Seminar in Hearing Science (2) Advanced study of perception of nonspeech acoustic signal, detectability, pitch, loudness, differential threshold, adaptation, and fatigue. Prereq: 602 or consent of instructor. May be repeated. Maximum 6 hrs.

611 Experimental Design in Speech and Hearing (3) Analysis of experimental design in theses and related journals. Generation of experimental designs. Prereq: Consent of instructor.

625 Advanced Seminar in Neurologically-based Communication Disorders (3) Topics vary. Prereq: 520, 539, and 524, or consent of instructor. May be repeated. Maximum 6 hrs.

650 Advanced Seminar in Audiology (2) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

652 Advanced Seminar in Speech and Language (2) Topics vary: aberrations of voice, articulation, speaking time and rhythm, language development or use, and language symbolism. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

655 Practicum in College Teaching (1-3) Supervised experience in college teaching. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

656 Directed Research (1-4) Participation in ongoing or non-disertation research. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

657 Directed Study in Speech Pathology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

658 Directed Study in Audiology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

659 Directed Study in Speech Science (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

660 Directed Study in Hearing Science (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

661 Advanced Seminar: Language Disorders in Children (3) Topics vary. Prereq: 561 or consent of instructor. May be repeated. Maximum 6 hrs.
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 in areas pertinent to aviation. Current emphases include flight testing, aircraft design, aviation meteorology, air traffic control, and airport management.

To qualify for admission to this program, the applicant must possess a Bachelor’s degree in engineering or science from an accredited institution, show evidence of ability to pursue and benefit from the program, and fulfill The University of Tennessee Graduate Admission procedures and grade-point standards. It is expected that the student will have a basic knowledge of computer utilization and statistics; an understanding of aerodynamic fundamentals, aircraft propulsion, and performance; and some understanding of economics.

Both thesis and non-thesis programs are available. The thesis program involves a minimum of 30 semester hours credit while the non-thesis program involves a minimum of 33 semester hours credit. Both options are fully supported off-campus utilizing electronic media for videotaping and interactive distance teaching methods.

THESIS OPTION

The thesis program involves satisfactory completion of the following requirements:

Research and Development Specialization
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Six hours in industrial engineering (engineering management).
3. Twelve hours of electives in the major field, mathematics or engineering.
4. Six hours of Aviation Systems 500 demonstrating the ability to conduct and report on an independent investigation.

Administration Specialization
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Three hours in industrial engineering (engineering management).
3. Three hours in economics or finance.
4. Six 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
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Six hours in industrial engineering (engineering management).
3. Twelve hours of electives in the major field, mathematics or engineering.
4. Three hours of an assigned project under Aviation Systems 550.
5. A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper.

Administration Specialization
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Three hours in industrial engineering (engineering management).
3. Three hours in economics or finance.
4. Twelve hours of electives in the major field, mathematics or engineering.
5. Three hours of an assigned project under Aviation Systems 550.
6. A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper.

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 Aviation Systems is available to residents of the states of Arkansas, Florida, Georgia, Kansas, Mississippi, Virginia, and West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
501 Aviation Systems: An Overview (3) Aviation systems, present and future. Socioeconomic base, aerospace and propulsion technology, meteorology, air traffic control, airport community interface, and technological trends and developments pertinent to present status and future development of air transportation.
502 Registration for Use of Facilities (1-15) 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 Airports and the Community (3) Structure of airports and their communities. Technology and economics of cargo, baggage, ticket and passenger handling. Airport management and economics, and logistics. Interfaces with community. Plans, programs and developments for collecting and distributing passengers and freight from various types of airports. Prereq: 501.
505 Governmental Policies for Aviation (3) Theoretical and legal basis for economic and governmental regulation of aviation. Historical and legislative development of aviation regulatory agencies, organizational structure, administrative and enforcement procedures. Prereq: 501.
506 Aircraft Design (3) Design process, compromise of conflicting requirements, economical, industrial, and legal aspects. Definition of requirements. Synthesis and optimization techniques, safety and reliability, systems integration, standards and regulations. Teamwork and design-making process.
507 Introduction to Airborne Radar (3) Theory and application of airborne radar. Radar detection and measurement techniques through aviation systems applications. Ground effects on radar signals of multipath and multipath correction. Pulsed operation. Processing of processing techniques, Doppler effects. Problems of range and range rate and tracking. Methods and techniques for reducing radar cross section.
508 Flight Test Instrumentation (3) Principles of measurement, measuring devices with views toward both ground and flight aerospace testing: measurement fundamentals, sensors for specific parameters (e.g., temperature, heat flux, flow rate, pressure, acceleration, vibration, strain, and humidity), data bus integration, signal condition, telemetry, and fabrication.
509 Introduction to Aircraft Structures (3) Design and analysis of structures: light-weight and modern materials used for aircraft structures. Topics: load determination and aviation regulations, airworthiness, ultimate loads, limit load factors and the simplifying assumptions to safe side; basics of stress and strain, elasticity, shear, bending, torsion; statically indeterminate structures, frames; structural instabilities, buckling of panels; tensile strength and failure; principles of stressed skin construction; open, closed, thin-walled beams; tapered beams, fuselages and frames, wings and ribs; laminated composite structures; elementary aerelasticity.
510 Special Topics in Aviation Systems (3) Current problems. Prereq: Consent of instructor. May be repeated with consent.
511 Theory and Application of GPS (3) Global Positioning System (GPS) for improved navigation and situational awareness for civil and military applications. GPS theory: geometric dilution of precision, satellite positioning, ionospheric delay, differential GPS, and GPS errors. Applications for navigation and aircraft flight-testing. Integration of GPS for aviation infrastructure and for air vehicle navigation, concepts of WAAS and LASS.
512 Helicopter Performance Flight Test Techniques (3) Experimental test techniques for helicopter performance flight testing. Theoretical derivation of flight test techniques. Participation in series of flight test experiments demonstrating acquisition of flight test data. Instrumentation and data reduction techniques.
513 Helicopter Stability and Control Flight Test Techniques (3) Experimental test techniques for helicopter stability and control flight testing. Theoretical derivation of flight test techniques. Participation in series of flight test experiments demonstrating acquisition of flight test data. Instrumentation and data reduction techniques.
514 Systems Flight Testing (3) Experimental test techniques for helicopter and airplane flight systems. Approach and design for testing airborne systems. Theory and operation of typical flight systems: aircraft systems, navigation systems, communications systems, and specific mission systems.
515 Aviation Human Factors (3) Human factors pertinent to aviation: concept of human factors, human error, fatigue, body rhythms, performances, motivation, vision and visual illusions, communication, attitudes, training and devices, displays and controls.
space and layout, anthropometry, flight deck design and evaluation, aircraft cabin design and evaluation, flying qualities evaluation, and performance measurement techniques. Applied aviation systems.

516 Aircraft Flight Controls (3) Feedback control concepts, root locus techniques, bode analysis, PID control design, and controller and observer design concepts applied to aircraft. Complex analysis and matrix algebra.


550 Project in Aviation Systems (3) Enrollment limited to Aviation System students in non-thesis program. May be repeated. Maximum 3 hrs allowed toward degree.

Biochemistry and Cellular and Molecular Biology

(College of Arts and Sciences)

MAJOR DEGREES

Biochemistry and Cellular and Molecular Biology .................. M.S., Ph.D.

Bruce D. McKee, Head

Professors:

Bagby, R. M., Ph.D. .................................. Illinois
Becker, J. M., Ph.D. ............................................ Cincinnati
Carlson, J. G. (Emeritus) (Distinguished Prof.), Ph.D. .................. Pennsylvania
Handel, Mary Ann (Distinguished Prof.), Ph.D. .................. Kansas State
Hochman, Ben (Emeritus), Ph.D. .................................. California
Howell, Elizabeth E., Ph.D. .................................. Lehigh
Jeon, K. W., Ph.D. .................................. London
Joshi, J. G. (Emeritus), Ph.D. .................................. Poona
Kennedy, J. R., Ph.D. .................................. Iowa
Koontz, John W. (Liaison), Ph.D. .................. Kentucky
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
Roberts, Daniel M., Ph.D. .................................. California (Davis)
Roth, L. Evans (Emeritus), Ph.D. ................. Chicago
Salo, T. P. (Emeritus), Ph.D. .................. Michigan
Serpers, Engin H., Ph.D. .................................. Hattiecock
Shivers, C. A. (Emeritus), 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:

Bruce, Barry, Ph.D. .................................. California
Ganguly, R., Ph.D. .................................. Nebraska
Hall, J. C., Ph.D. .................................. Illinois
Peterson, Cynthia B., Ph.D. ...................... LSU
Prosser, R. A., Ph.D. .................................. Illinois

Assistant Professors:

Dealwis, C., Ph.D. ...................... London
Fernandez, E., Ph.D. ...................... Loyola
Park, J., Ph.D. ...................... Texas A&M

Research Professors:

Mazur, Peter, Ph.D. ...................... Harvard
Rinchik, Eugene, Ph.D. ...................... Duke

Research Assistant Professor:

Kleib, 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 three semesters.
5. Six hours of master’s research and a thesis. If the thesis is a terminal project, the candidate is expected to have a background equivalent to that required of undergraduate majors in this department for award of a master’s degree.

Graduate Courses

401-402 Biochemistry-Molecular Biology I, II (3,3)


403 Advanced Genetics Laboratory (3) Experiments illustrating methods in modern genetics: techniques in classical, cytological, molecular and developmental genetics. Model organisms, Drosophila and mouse. Prereq: General Genetics and Organic Chemistry.

410 Cellular and Comparative Biochemistry (4) Electolyte behavior, chemistry and structure of proteins; enzyme behavior and biological function; catabolism 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 Organization and Function of the Cell, and Biology 240 General Genetics. 3 hrs and 1 discussion.

419 Cellular and Comparative Biochemistry Lab (2) Experiments with enzymes, nucleic acids, and membranes and organelles. Chromatography, kinetics, hybridization, sequencing, and immunochromatographic methods. Prereq or coreq: 410 or 419. F,Sp

421 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 technologies. Experimental modules: techniques used in cell isolation, purification, culturing,
fluorescent microscopy, receptor binding and signal transduction, apoptosis, cell cycle analysis, protein and steroid secretion, computer modeling, and state-of-the-art experimental design, execution, data analysis, and peer evaluation. Prereq. or coreq: 401 or 410. F


455 Human Genetics (3) Genetic and molecular principles and problems of human inheritance. Prereq: Biology 240 General Genetics.

471-81 Biophysical Chemistry (3,3) Physicochemical principles with applications to biological systems. 471—Thermodynamics; chemical equilibrium; solution chemistry; transport; electrochemistry; kinetics; enzyme catalyzed reactions, 481—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 Science 480.)

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

502 Registration for Use of Facilities (1-15) Required for the above 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. Sp.

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 proteins. Prereq: Prior knowledge of cell biology and biochemistry and/or consent of instructor. F

512 Advanced Molecular Biology (3) Regulation of nucleic acid expression and protein activity. Nucleic acid structure and function; replication and repair of nucleic acids; gene expression; protein synthesis; post-translational protein modification; mitosis and meiosis; cell cycle and cell growth. Prereq: 511 or consent of instructor. Sp

513 Advanced Protein Biochemistry and Cell Biology II (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. Pr

515 Experimental Techniques 1 (4) Modern experimental methodology and instrumentation lab. cell growth; spectrophotometry; microscopy; nucleic acid purification and analysis; protein assays; enzyme purification; electrophysiology; 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. F

516 Experimental Techniques 11 (3) Laboratory rotations. Students work in laboratory of faculty member on clearly defined independent 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, diffusion and transport; physical chemistry of macromolecules; enzyme kinetics; binding reactions; spectroscopy; electrophysiology. Prereq: 511 or consent of instructor. F

520 Special Topics (1-2) Selected directed readings or special course in topics of current interest. Consult departmental listing for offerings. May be repeated with consent of instructor. Maximum 6 hrs. S/NC only.

525 Graduate Research Participation (3-12) Tutorial laboratory experience. May be repeated. Maximum 12 hrs. F

530 Experimental Design and Analysis (3) Development of skills in experimental design and interpretation of experimental results. Critical discussion of research articles illustrating issues in 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: 511-12-13, 515-16-17. Sp.

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.

552 Physiology of Hormones (3) Cellular and organismal action of hormones in invertebrate and vertebrate animals. Prereq: Consent of instructor. Recommended prereq: 410. 2 hrs and 1 lab. F

560 Advanced Concepts in Structural Biology/Biochemistry (3) Concepts related to structural biology/biochemistry 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 Microscope (3) Practical applications of electron microscopy and scanning electron microscopy. Use of microscope and ancillary equipment, darkroom techniques, preparation of materials for publication, special project. Admission limited only to departmentally approved graduate students. (Same as Botany 510.) 2-3 hrs labs. Sp

564 Introduction to Electron Microscopy-Scanning Electron Microscope (3) Practical applications of electron microscopy and to scanning electron microscopy. 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.


580 Advanced Concepts in Genetics/Developmenal Biology (3) Concepts related to genetics/developmental biology with information taken from current literature, predomnantly 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) P/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 physical methods, mechanisms of enzyme catalysis, gene expression, membrane structure and function, metabolic regulation, physiochemical activity, molecular genetics, cell ultrastructure and physiology, neurobiology, and related topics. Required every semester in residence. 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 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 reports, computer simulations by faculty and students. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs.

612 Advanced Topics in Environmental Toxicology (1-3) (Same as Ecology and Evolutionary Biology 612.)

615 Special Topics in Biochemistry, Cellular, and Molecular Biology (3) Biochemical and biophysical methods, mechanisms of enzyme catalysis, gene expression, membrane structure and function, metabolic regulation, physiochemical activity, molecular genetics, cell ultrastructure and physiology, neurobiology, and related topics. Prereq: 511-12 or consent of instructor. May be repeated. Maximum 9 hrs.

Biosystems Engineering and Environmental Science

(College of Agricultural Sciences and Natural Resources)

MAJORS

DEGREES

Biosystems Engineering .................. M.S., Ph.D.
Biosystems Engineering Technology ..... M.S.
Plant and Soil Sciences ................. M.S., Ph.D.

Ronald E. Yoder, Head

Professors:

Ammon, J. Tom, Ph.D. .................. West Virginia
Ayers, P. D., Ph.D. ..................... NC State
Bell, F. F. (Emeritus), Ph.D. .......... Iowa State
Buchserhohme, M. J., Ph.D. .......... Clemson
Denton, H. P., Ph.D. .................... NC State
Foss, J. E. (Emeritus), Ph.D. ......... Minnesota
Henry, Z. A. (Emeritus), Ph.D. ....... NC State
Luttrell, D. H. (Emeritus), Ph.D. ... Iowa State
McDow, J. J. (Emeritus), Ph.D. ...... Michigan State
Mote, C. R., Ph.D. ....................... Ohio State
Sewell, J. I. (Emeritus), Ph.D. ......... NC State
Shelton, G. H. (Emeritus), M.S. ....... VPI
Springer, M. E. (Emeritus), Ph.D. ........................... California
Tompkins, F. D., PE, Ph.D. .......... Tennessee
Tyler, D. D., Ph.D. .................... Kentucky
Wilhelm, L. R., PE, Ph.D. ........... Tennessee
Wills, J. B., M.S. ........................ Tennessee
Yoder, D. C., Ph.D. ................. Purdue
Yoder, R. E. (Liaison), PE, Ph.D. ............... Colorado State

Associate Professors:

Burns, R. T., Ph.D. .................... Tennessee
Essington, M. E., Ph.D. ............... California (Riverside)
Freeland, R. S., PE, Ph.D. .......... Tennessee
Grande, G. F., Ph.D. ................. Tennessee
Hart, W. E., Ph.D. ............... Purdue
Logan, J., Ph.D. ...................... Nebraska
Pordesimo, L. O., Ph.D. .......... Penn State
Raman, D. R., PE, Ph.D. .............. Cornell
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 in 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 machinery 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.

An interdepartmental graduate program in Plant and Soil Sciences is jointly offered by the Biosystems Engineering and Environmental Science Department and the Plant Sciences and Landscape Systems Department. This program offers the Master of Science and Doctor of Philosophy degrees. See the Department of Plant Sciences and Landscape Systems for major courses offered and a description of degree requirements. Subject to approval of the student's graduate committee and program faculty involved, some exceptions to the specific course requirements may be allowed. However, any exception must be consistent with the University requirements and the overall objectives of the degree program.

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

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:

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

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

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

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.

#### Plant and Soil Sciences

The environmental and soil sciences faculty in the Department of Biosystems Engineering and Environmental Science participate in the Plant and Soil Sciences Master's degree program offered jointly by the Department of Biosystems Engineering and Environmental Science and the Department of Plant Sciences and Landscape Systems.

### THE DOCTORAL PROGRAM

#### Biosystems Engineering

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**
- **Coursework in computational methods** (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department)
- **Program electives**
- **Seminar (507, 505 or equivalent courses)**
- **600 Dissertation**

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 Council.

#### Plant and Soil Sciences

The environmental and soil sciences faculty in the Department of Biosystems Engineering and Environmental Science participate in the Plant and Soil Sciences doctoral program.

A minimum of 72 hours beyond the Bachelor's degree, exclusive of credit for Thesis 500, is required. Of this number, 24 hours must be Doctoral Research and Dissertation 600. A minimum of 26 hours must be completed in courses numbered above 500 exclusive of doctoral research and dissertation, of which 6 must be in courses numbered above 600. A minimum of 9 hours of graduate course work taken during the doctoral program must be outside the major in one or more cognate areas. Major courses include those in: Plant and Soil Sciences, Environmental and Soil Sciences, Integrated Plant Systems, Ornamental...

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 outside the department. The committee must approve all coursework applied toward the degree, certify the student’s mastery of the major field and any cognate fields, direct the research, recommend the dissertation for approval and acceptance by the Office of Graduate Student Services.

See the Department of Plant Sciences and Landscape Systems for additional details and additional major courses offered.

Biosystems Engineering

GRADUATE COURSES


421 Natural Resource Engineering (3) Introduction to hydrologic cycle: movement of water and interaction with environment through such processes as erosion and contamination. Flow processes through estimation and measurement, and controlling impacts through engineering design. Specific designs: waterways, erosion and sediment control structures, waste management systems, irrigation systems, and hydrologic monitoring systems. Prereq: 321 Fluid Mechanics, Environmental and Soil Sciences 210 Introduction to Soil Science, Civil Engineering 390 Hydraulics, or Aerospace Engineering 341 Fluid Mechanics. 2 hrs and 1 lab. F

431 Bioprocessing Engineering (3) Application of basic engineering principles to processing and handling of biological materials, such as chemical, biological, and physical properties; materials handling; material conversion operations; drying, heat exchangers, and bioprocessing. Prereq: 321 Biotechnology, Heat and Mass Transfer, Mathematics 231 Differential Equations. 2 hrs and 1 lab. F

441 Life Systems Engineering (3) Design of controlled environments to optimize conditions for organism growth and development: growth equations and population dynamics; plant growth systems; microbial growth systems; animal growth systems; biotechnological applications. Prereq: 321 Biothermodynamics, Heat and Mass Transfer, Mathematics 231 Differential Equations, 1.2 hrs and 1 lab. Sp

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. Prereq: Circuits and Electric Machinery Components. 3 hrs and 1 lab. Sp

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

502 Registration for Use of Facilities (3-15) Requiring for the student not otherwise registered during any semester when student uses University facilities. May not be used toward degree requirements. May be repeated. S/N/C only. E

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

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

510 Similitude in Research and Design (3) Dimensional analysis; governing equations; theory of models; true, distorted, dissimilar models; prediction equations; interpretation of data; applications to machinery, soil and water structures, agricultural buildings and other agricultural engineering related problems. Prereq: Environmental Engineering Science 521, 341. 2 hr and 1 lab. F,A

525 Soil Erosion and Sediment Yield (3) (Same as Environmental Engineering 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 inactivation; feeding, conditioning; aeration; substrate characteristics; process kinetics; and odor control. Design component. Prereq: Thermodynamics, heat and mass transfer. F

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

545 Monitoring Hydrologic Phenomena (3) Application of instrumentation theory to monitoring hydraulic phenomena; strengths and weaknesses of current equipment and systems; equipment operation and solutions of environmental engineering problems. Prereq: 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 on specialized topics. May be repeated. Maximum 6 hrs. E

552 Biological Treatment Theory (3) (Same as Environmental Engineering 552.)

555 GIS and GPS Applications to Biosystems (3) Theory and applications of Geographical Information Systems (GIS) and Global Positioning Systems (GPS); environmental and natural resource management; spatial data. Site-specific agriculture, environmental site assessment, natural resource management, and hydrology. Prereq: Graduate standing in engineering, biological or physical sciences. (Same as Biosystems Engineering Technology 555.) 2 hrs and 1 lab. F

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/NP only. E

620 Computer Simulation of Agricultural Systems (3) Scientific approach to digital simulations: 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; verification and calibration of simulation model results. Prereq: Knowledge of computer programming language. 2 hrs and 1 lab. F

630 Feedback and Control Systems (3) Differential equations for physical systems: solutions, transforms, and system response. Types of control, frequency response, Bode analysis, root locus analysis. Application to agricultural systems. Prereq: 451 or equivalent. 2 hrs and 1 lab. F,A

650 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 bioprocessing technology: principles of fluid mixing, processing, drying, and fluid and heat transfer, heat exchanger design, fluid evaporation, thermal processing, heating and cooling, refrigeration systems, and materials handling. Prereq: Basic physics. 2 hrs and 1 lab. F

432 Agricultural Machinery and Tractors (3) Functions: selection, matching, and management of agricultural machines. Tractor power ratings, engine and transmission systems, hydraulic systems, hitching, and ballasting. Field and material capacity, field efficiency, cost analysis, and machinery replacement strategies. Functional analyses of tillage operations, planters and drills, no-tillage systems, hay harvest systems, forage and small grain harvesting, and cotton harvesting. Crop drying processes, off-road machinery safety considerations, and operator ergonomics. Prereq: Mathematics 123 Basics Calculus or 125 Finite Mathematics or consent of instructor. 2 hrs and 1 lab. Sp

442 Agricultural Waste Management and Pollution Control (3) Waste renovation fundamentals; characteristics of animal manure; techniques for collection, transporting, storing, and utilizing livestock waste. Prereq: Basic Calculus or Finite Mathematics or equivalent. 2 hrs and 1 lab. F

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

462 Agricultural Chemical Application Technology (3) Equipment for application of liquid, solid, and gaseous agricultural chemicals; system components; operational characteristics; calibration; selection and management; safety considerations; materials handling and disposal methods. Prereq: Basic calculus or finite mathematics or equivalent or consent of instructor. 2 hrs and 1 lab. 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 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

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

506 Physical Phenomena (3) Properties of materials, fundamentals of hydraulics, principles of electricity, and thermal phenomena, applications in biological systems. Prereq: Consent of instructor. 2 hrs and 1 lab. F

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

508 Special Problems in Biosystems Engineering Technology (1-3) Individual studies of current problems. May be repeated. Maximum 6 hrs. E

514 CAD Applications to Biosystems Engineering (3) Computer Aided Drafting (CAD) applications in agricultural and environmental systems. Essentials of CAD software to create drawings of components, systems, flow charts, and process diagrams. Applications in mechanical, structural, and biosystems. 2D applications with limited exposure to 3D applications. Computer intensive course. Hands-on experience. Prereq: Computer proficiency and admission to graduate program. (Students cannot receive credit for both 514 CAD Applications to Biosystems Engineering and 514.) Two 2-hr labs. F
522 Processing and Environmental Systems (3) Environmental systems in plant and animal production; application of electric power, mechanical equipment, structures, crop processing and materials handling. Prereq: 506. 2 hrs and 1 lab. Sp, A

532 On-Site Domestic Water Supply and Wastewater Renovation (3) Basic ground water hydrology, selection and design of pumps and delivery systems, and point-of-use water treatment processes; soil based wastewater renovation principles, and design and operating criteria for on-site wastewater renovation systems. Prereq: 506. 2 hrs and 1 lab. F, A

542 Simulation of Agricultural Systems (3) Synthesis and analysis of agricultural systems using computer simulation, philosophy of system simulation, critical path, discrete and continuous systems. Prereq: 506 and scientific computer programming. 2 hrs and 1 lab. F, A

546 Automation Devices and Applications (3) Basic electronics as applied to simple automation systems, programmable controllers, data acquisition, digital logic and transducers. Prereq: 506 or consent of instructor. 2 hrs and 1 lab. Sp, A

555 GIS and GPS Applications to Biosystems (3) (Same as Biosystems Engineering 555.)

562 Selected Topics in Biosystems Engineering Technology (1-3) Lecture/group discussion on specialized topics. May be repeated. Maximum 6 hrs. E

574 Environmental Instrumentation and Monitoring (3) Equipment and techniques commonly used to measure all aspects of hydrologic cycle: precipitation, runoff, streamflow, subsurface water movement. Sampling of all flows for contaminants. Design of monitoring systems. Analysis of data. Prereq: Environmental and Soil Sciences 324 Soil and Water Conservation, Statistics 201 Introduction to Statistics, Mathematics 152 Mathematics for the Life Sciences II, or consent of instructor. (Students cannot receive credit for both 474 Environmental Instrumentation and Monitoring and 574.) 2 hrs and 1 lab. Sp

Environmental and Soil Sciences

GRADUATE COURSES

434 Environmental Soil Chemistry (3) Composition and chemical properties of soils and processes that govern fate and behavior of chemicals in soil environment: clay mineralogy; soil organic matter; mineral weathering and stability; aqueous equilibrium; surface chemistry; ion exchange, adsorption and molecular retention; oxidation-reduction; and soil acidity, alkalinity, and salinity. Prereq: Soil science and organic chemistry or equivalent. F

442 Soil Genesis and Classification (3) Soil genesis and formation; observing and describing morphology of agricultural and forest soils; chemical and physical properties, classification. 3 weekend field trips. Prereq: Soil science. 2 hrs and 1 lab. F

444 Environmental Soil Physics (3) Basic understanding of soil physical processes and properties; practical experience in measurement and analysis of soil physical properties; methods of analysis related to agricultural, environmental, and engineering issues. Prereq: 210 Introduction to Soil Science and Physics 221 Elements of Physics or equivalent. 2 hrs and 1 lab. Sp

462 Environmental Climatology (3) Study of atmosphere as environment. Physical, chemical and biological factors affecting climates of various earth environments; meteorological process affecting biosystems. Climatic change and the human impact on the atmosphere, consequences of climatic change and mitigation policies, microclimates and urban climates, atmospheric pollution, extreme events and ozone depletion. Design and operation of weather information systems; automated weather stations. Prereq: Agriculture and Natural Resources 250 Computer Applications to Problem Solving or equivalent.

481 Capstone in Environmental and Soil Sciences (3) Integrative course in which students work individually and collaboratively to develop solutions for soil and water related environmental problems. Writing and oral communication emphasis course. Prereq: 434 and senior standing. Sp, A

Botany

(College of Arts and Sciences)

MAJOR

Botany ........................................ M.S., Ph.D.

Edward E. Schilling, Head

Professors:

Caponetti, J. D. (Emeritus), Ph.D. ....... Harvard

Clebsch, E. E. C. (Emeritus), Ph.D. .... Duke

DeSelim, H. R. (Emeritus), Ph.D. .... Ohio State

Evans, A. M. (Emeritus), Ph.D. .... Michigan

Heilman, A. S. (Emeritus), Ph.D. .... Ohio State

Hendron, W. R. (Emeritus), Ph.D. .... Vanderbilt

Hickok, L. G. (Emeritus), 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. (Emeritus), Ph.D. ...... Texas

Associate Professors:

Amundsen, C. C., Ph.D. .......... Colorado

Pigliucci, M., Ph.D. .......... Connecticut

Smith, D. K., Ph.D. .................. Tennessee

Wolford, B. E. (Curator), Ph.D. ...... Tennessee

Assistant Professors:

Cruzan, M. B. C., Ph.D. .... SUNY (Stony Brook)

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, cyto genetics, ecology, genetics, lichenology, molecular biology, morphology, mycology, photobiology, physiology, phylogeny, pteridology, and systematics.

Educational service is required of each graduate degree candidate and such service will include teaching and/or ancillary services performed in the department related to the instruction of courses.

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 much 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 pro-tem committee during the first meeting with the student.

THE MASTER’S PROGRAM

The program for the Master of Science is patterned 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 completion of a written formulation and an 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 departmental 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 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. Specializations 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, mycology, agrostology, mycology, phylogeny, aquatic vascular plants, synan- therology, woody plants, and botanical photography. May be repeated under different topic. Maximum 9 hrs.

404 Plant Molecular Biology (4) Current research in plant molecular biology: techniques and procedures. Genotype structure, gene expression and regulation, transformation, transposable elements, plant development. Labs: isolation of DNA and RNA, molecular hybridization, isolation and preparation of plasmids, PCR amplification of specific sequences, DNA se- quencing and transformation. Prereq: Biodiversity; Organization and Function of the Cell and Genetics with grade of B or better and consent of instructor. 2 hrs and 4 labs.

412 Plant Anatomy (3) 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.

419 Science as Method (3) (Same as Ecology and Evolutionary Biology 419 and Philosophy 419.)

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. (Same as Ecology and Evolutionary Biology 431.) Sp

451 Plant Tissue Culture (3) Methods for culture of cells, tissues, and organs: media preparation and maintenance of cultures. Prereq: General Botany or Biodiversity; Organization and Function of the Cell or equivalent and General Chemistry or equivalent. Recom- mended prerequisite: Botany 412; Plants: Evolutionary Survey; Introduction to Plant Physiology; Introduction to Microbiology and Lab; Plant Propagation; and Field and Forage Crops.

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

502 Registration for Use of Facilities (1-15) May be repeated. Maximum 4 hrs. E

503 Non-Thesis Research (2) Library, field, or labo- ratory research under supervision of staff member. Not for thesis candidates. May be repeated. Maximum 4 hrs. E

506 Phycology (4) Comparative study of major algal phyla and freshwater and marine: morphological, developmental, ecological, taxonomic and phylogen- etic aspects. Field and laboratory studies, identifica- tion, classification, experimentation. Prereq: 310 or consent of instructor. 3 hrs and 1 lab. F.A

507 Biological Illustration (3) Principles and appli- cations of photography (B/W and Color) photomicro- and photomicrography, drawing, graphics and video for recording and presentation for research and publication of data in pictorial and graphic form.

510 Introduction to Electron Microscopy - Trans- mission Electron Microscopy (4) (Same as Bio- chemistry and Cellular and Molecular Biology 562.)

521-22 Advanced Plant Physiology I, II (3,3) 521-- Plant biochemistry and metabolism; respiration, photo- synthesis, carbon partitioning, and biosynthesis of specialized plant products: terpenoids, alkaloids, phe- nolics and plant growth regulators. 522--Growth and differentiation of plant cells at molecular, cellular and organismic levels. Hormonal regulation of develop- ment; macromolecular interpretation of differentiation, dormancy, germination, flowering and cell sequence. Prereq: Introduction to Biochemistry or Biochemistry and Cellular and Molecular Biology 410 and 1 semester of introductory Plant Physiology or Cell Biology.

530 Advanced Anatomy of Flowering Plants (3) Evolution and classification of families of angio- smeres, local flora. Prereq: 330 or equivalent. 2 hrs and 1 lab. F.A

531-32 Special Problems in Botany (1-4, 1-4) May be repeated. Maximum 12 hrs.

544 Seminar in Botany (1) Readings and discussions of current literature and/or selected topics in botanical research. May be repeated. Maximum 8 hrs. S/NC only.

585 Methods and Instrumentation in Field Investi- gations (1) Appropriate methods and instrumentation. Topics vary. May be repeated with consent of instruc- tor. Maximum 5 hrs. S/NC only.

599 Advanced Evolutionary Ecology (3) Advanced concepts in evolutionary and ecological genetics. Biogeography, climate, population genetics, evolution and natural selection, population growth and regulation, competition, niche, experimental ecology, predation, phylogenetics in ecology, biodiversity and conserva- tion. Prereq: General Biology and General Ecology; one or more courses on organismal biology (ecology, evolution) at the upper undergraduate level or consent of instructor. Students cannot receive credit for both 499 and 599. (Same as Ecology and Evolutionary Biology 599.) Sp, A

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

606-07 Advanced Topics in Botanical Sciences (1- 3,1-3) Experimental botanical science: nomenclature, morphology and systematics of vascular plants, cryptogamic botany, cytology and cell biology, genetics, plant physiology, palynology and ecology. May be repeated. Maximum 12 hrs.

662 Seminar in the History of Botany (2) History of botanical exploration and advances from early civilized 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
Howard, Herbert H. (Emeritus), Ph.D. ...... Ohio
Moore, Barbara A., Ph.D. ......................... Ohio
Swan, Norman R., Ph.D. .................... Michigan

Associate Professor:

Bates, Benjamin J., Ph.D. ................. Michigan

Assistant Professors:

Harmon, Mark, Ph.D. ..................... Ohio
Kaye, Barbara, Ph.D. .................. Florida State
Luther, Catherine, Ph.D. .................... Minnesota

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: 430 or consent of instructor.


460 Broadcast News Operations (3) Production of news 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, Broadband, and Interactive Digital Media (3) History and structure of cable television and other broadband delivery systems; DBS, Internet. Development of digital broadcasting, interactive tele- vision, and other broadband media systems and digital technology. Regulatory, policy, programming, and management issues arising from new media and digital technologies. Prereq: 275 Introduction to Radio and Television or consent of instructor.


550 International Broadcasting (1) Broadasting systems in other countries. Analysis of international broadcasting organizations. Intercultural communica-
course, GPA 3.0 or better, and consent of department. Final term paper. No retroactive credit for educational experience beyond that available at university. Consent of non-university professional organization.

590 Advanced Radio & Television Management (3) Financial management of broadcast operations: budgeting, financial planning, accounting, and related techniques. Theoretical perspectives in broadcast management, organization, and management of commercial and non-commercial operations from perspective of general manager, Prereq: 490. Sp

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

598 Internship (3) Full-time (30-40 hrs per week) work experienced in news, production, or sales and management with non-university professional organization. Educational experience beyond that available at university, Final term paper. No retroactive credit for previous work experience. Prereq: Senior or graduate standing, completion of at least 15 hrs of broadcasting courses, GPA 3.0 or better, and consent of department head.

THE MBA PROGRAM

The full-time MBA program is designed for students with undergraduate degrees in a wide variety of fields, including the social and natural sciences, humanities, and professional fields such as engineering, business, agriculture, and architecture. In addition, most students in this program should have two or more years of work experience beyond their undergraduate degree(s). The MBA program is a 17-month program with students beginning in late July of each year and graduating in December of the following year. The objective of the 17-month program is to develop leaders able to enhance the success of their organizations. Specific emphasis is placed upon competency in the area of integrated value chain management. This managerial perspective acknowledges that an organization’s success is strongly related to its ability to function effectively and efficiently within a larger network of allied businesses. Managers must understand how to integrate business functions within their organizations, as well as across the other organizations within their value chain. Integrated value chain management rests upon a foundation including: supply chain management, information management, resource management, and customer relationship management. In addition, students will pursue concentrations and careers in a variety of areas, including finance, logistics and transportation, marketing, and operations management.

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 Application for Graduate Admission, 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 item should reach the Office of Graduate Admissions one month before the MBA application deadline to allow for processing. Additional information is required by Graduate Admissions for international students.

For application 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 that make up the total application; therefore, there is no automatic cut-off for either graduate management 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 ability with both qualitative and quantitative work.

MBA Core

The MBA core (32 hours total) consists of: a 3-hour foundations course taken during the three weeks prior to the beginning of fall semester, a 15-hour core course and a 1-hour career development course taken in the first semester (Fall 1), a 3-hour course taken in the second semester (Spring 1), a 3-hour distance course taken during the internship (Summer), and a 1-hour capstone in the third semester (Fall 2). The topics introduced within these courses follow three major themes. These three themes answer questions “what every manager needs to know,” and includes such functional topics as finance, strategy, decision tools, environmental analysis, and leadership skills development. The second theme focuses on functions involved in the flows of product, information, and finances within an integrated value chain, to include, but not limited to, operations management, logistics management, demand management, customer relationship management, supplier management and resource management. The third theme involves integrating the content of the other two themes using information and technology. Throughout all three themes, significant emphasis is placed on learning the topics in an integrated fashion. Students will understand how various business functions are integrated within an organization, as well as how integration should occur across organizations within the context of a value chain.

Students in the first-year core undertake active learning within a team setting which 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. Any event, selection should be made after the first semester and 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 15 credit hours in the concentration/electives block, 9 credit hours must be taken in one of the following concentration areas. For specific courses required in concentration areas, see the appropriate field of instruction.

Finance

Logistics and Transportation

Marketing

Operations Management

The first course in each concentration is designed to provide a foundation upon which the concentration can be built. These courses will be delivered in the latter part of the spring semester of the first year, after the Spring core course has been completed. They are intended to prepare students for their summer internships. However, these courses should not be thought of as simply the first three hours in a nine-hour elective. Rather, these courses are self-contained, intensive introductions to a specialty area of business. Students will choose two of these courses in the spring semester, which will permit them flexibility for choosing concentrations in the second year of the program. Two additional courses in the concentration area will be taken in the second fall semester to meet the 9-hour requirement for a concentration.

Elective courses may be chosen from any 500-level courses in the College of Business. Courses outside the College of Business Administration as well as courses listed in the Graduate Catalog numbered below 500 may be included as an elective 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 4 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 maximum 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 and must meet all requirements of the Graduate Council.

Other Requirements

The Application for Admission to Candidacy must be approved by three faculty members in the student’s area of concentration and the Assistant Dean of the MBA Program. It should be submitted to the Graduate Student Services Office at least one full semester prior to the date the degree is conferred. (Admission to candidacy for the MBA degree must be submitted in the spring semester for graduation in the following fall 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, a B average or higher in courses comprising the concentration area, and a B average or higher in the overall program.

THE EXECUTIVE MBA PROGRAMS

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 554, 555, 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 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 Council and submit transcripts of all undergraduate and graduate work. Applicants may need to take the Graduate Management Admission Test (GMAT) (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 earned a degree from an accredited U.S. college or university within the past two years. A minimum TOEFL score of 213 on the computer-based test is required for admission to graduate study.

Prerequisites: Although there are 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 integrated 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 weekend 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 approximately five years of work experience. The emphasis is on practical tools that will 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. 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/or Sunday afternoon. The program begins in August with an intensive workshop 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 priority deadline is April 10.

Additional information on the professional MBA can be found at www.promba.utk.edu.

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. Typical students bring a greater knowledge of business fundamentals than is true of other MBA programs. The executive MBA places considerable emphasis on global business and on individual skills of leadership. The executive MBA also has a heavy emphasis on strategic thinking and leadership management concepts. The executive MBA is the right choice for individuals who are in positions of broad responsibility or who have been designated to fulfill such roles within their organizations in the future.

The executive MBA is three consecutive semesters completed in 12 months. The class meets in Knoxville for 11-day residencies periods in alternate months starting in January and ending in December. The May residence period is a global business seminar of two weeks and is held in South America, Asia or Europe. Off-campus work includes synchronous distance learning classes and requires substantial and regular contact with faculty and other participants. The project work in the executive MBA is a large-scale management project running throughout the year, chosen by participants 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. The GMAT may be waived
Taiwan 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. 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 a three consecutive semesters completed in 12 months. The class meets in Knoxville for 8-day residence periods in January, April, August, and December. Between residence periods, synchronous distance learning classes are held each Saturday morning, and there are asynchronous internet learning sessions each week. Applications are accepted for January entry only. Applications are accepted throughout the year. The final application deadline is November 1. Applicants to the physician executive MBA are not required to take the GMAT test.

Additional information on the physician EMBA can be found at www.pemba.utk.edu.

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 a minimum of 10 years of work experience and are currently in management positions. The Taiwan executive MBA is to provide a good grounding in the fundamentals of various western business functions and a good basis in strategic thinking. Learning is expanded through applying these tools within the student’s own organization through structured projects 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 three semesters completed in 19 months. Teams of UT faculty travel to Taipei for five 8-day residence periods starting 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.

Applications are accepted for May entry only. The application deadline is April 1. Taiwan executive MBA applicants are not required to take the GMAT. Students accepted into the program will receive materials for study preceding 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 the test with a score of 213 or higher on the computer-based test. This test may be taken after enrolling in the program but must be successfully completed prior to the final residence period in Knoxville. To allow for registration, delivery of scores and receipt of the test result, students should arrange to take the TOEFL at least 5 months before the Knoxville residence period.

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 15 hours (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-oriented 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., Graduate Admissions and College of Business Administration for the MBA degree, and by the Dual Program Committee. Students who have been accepted by both colleges may 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 are started prior to entry into the last 28 semester hours of J.D. coursework and prior to the third semester of the MBA program. Students interested in entering the dual degree program should submit a letter of application to the Dual Program Committee. In 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 MBA for acceptable performance in approved graduate-level courses offered in the College of Business Administration. The College of Business Administration will award up to 6 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 may 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 in the J.D. program, students register through the College of Law. During the first year in the MBA program, students register as graduate students. After the first two years, any term in which students take law courses or a mixture of law and graduate courses, they are classified and registered as law students. If taking only graduate courses, they are classified and registered as graduate students.

Approved Dual Credit

MBA courses in which the student has earned a B grade or higher and are to be counted toward the J.D. program must include 9 semester hours approved by the College of Law. The 6 hours of law courses in which the student has earned a 2.3 or C+ grade or higher and are to be counted toward the MBA must be selected from those approved by the Assistant Dean of the MBA Program.

DUAL M.S.-MBA PROGRAM

The College of Business Administration and the College of Engineering offer an integrated program leading to the conferral of the Master of Business Administration degree with a major in Business Administration (concentration in operations management) and the Master of Science degree with a concentration in industrial engineering (concentration in manufacturing systems engineering or product development and manufacturing), Industrial Engineering (concentration in manufacturing systems engineering or product development and manufacturing), or Mechanical Engineering (concentration in product development and manufacturing).

The Engineering Science program is intended to provide other engineering majors an opportunity to participate in this program with a flexible schedule and convenient location based on their undergraduate degree.

The Industrial Engineering program is also open to students with undergraduate engineering majors other than industrial engineering.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate an increasingly complex
body of knowledge for rapid introduction of new products to the marketplace. The objective of the dual degree program is to prepare graduates to take a leading management role in companies that must react quickly to a dynamic market where forces of competition require rapid changes in design and manufacturing and a short product development cycle.

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, Graduate Admissions for the Master of Business Administration degree program and the Master of Science degree program with a major in Engineering Science, Industrial Engineering, or Mechanical Engineering, and by the Dual Program Committee.

Students will initially apply for the MBA program, indicating on their application the intent to pursue the dual M.S.-MBA program and the appropriate engineering major (refer to the MBA program for separate instructions). Students accepted for both the MBA and one of the engineering degree programs will be assigned to Dual Program Committee advisors, who will be responsible for course approval and supervision of the students’ 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 Graduate Admissions for international students.

Curriculum

All engineering students enrolled in the dual program must complete common coursework designed to provide them with an integrated, multidisciplinary teamwork experience. The MBA curriculum consists of 33 hours of common coursework in the College of Business Administration and 15 hours of common coursework in the College of Engineering. Engineering common coursework includes a culminating 3-hour integrated project course requiring a comprehensive report, and a final examination as required by the Dual Program Committee, to be taken during the first session of summer following the second year.

During the second year dual degree candidates will take courses in their engineering major. The coursework for each option is designed to provide students with a concentration in their major and advanced skills to accomplish their teamwork assignments.

Dual degree candidates enrolled in Engineering Science option are required to take 18 hours of graduate level engineering courses during the second year of the program. This option requires a coursework plan, approved by the Dual Program Committee, including a concentration such that the student can accomplish his/her teamwork assignments.

Curriculum for Dual M.S.-MBA Degree

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<th>Fall - First Year</th>
<th>Spring</th>
<th>Fall - Second Year</th>
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<tr>
<td>August - First Year</td>
<td>BA 511 MBA Core I</td>
<td>BA 512 MBA Core II</td>
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<td>BA 512 MBA Core II</td>
<td>IE/ME504 Product Development Process 1</td>
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<tr>
<td>IE/ME504 Product Development Process 1</td>
<td>IE/ME 513 MBA Core III</td>
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<td>IE/ME 513 MBA Core III</td>
<td>IE/ME 506 Product Selection and Evaluation</td>
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<td>IE/ME 508 Integrated Product, Process, and Manufacturing System Design</td>
<td>Summer</td>
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<td>Internship</td>
<td>BA 514 Integrated Business Simulation 3</td>
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<td>BA 514 Integrated Business Simulation 3</td>
<td>IE/ME 509 Project Management 1</td>
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<td>IE/ME 509 Project Management 1</td>
<td>Fall - Second Year</td>
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<td>— Engineering major</td>
<td>Spring</td>
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<td>MBA &quot;hub&quot; course elective</td>
<td>BA 511 Business Planning and Commercialization</td>
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<td>IE/ME 509 Project Management 1</td>
<td>IE/ME 509 Project Management 1</td>
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<td>IE/ME 509 Project Management 1</td>
<td>Summer (first session)</td>
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<tr>
<td>— Engineering major</td>
<td>IE/ME594 Culminating Integrated Project Report</td>
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<td>IE/ME594 Culminating Integrated Project Report</td>
<td>TOTAL 63-69</td>
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*Students in manufacturing systems engineering concentration may substitute other selected IE courses for these courses.

For additional requirements for Master of Science degree with majors in Engineering Science, Industrial Engineering, or Mechanical Engineering, refer to program descriptions for those majors.

The dual degree candidate must satisfy the curriculum and graduation requirements of the engineering major being pursued and the College of Business Administration. Students withdrawing from the dual degree program before completing both degrees will not receive credit toward graduation in either degree program for courses taken 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.

Approval Dual Credit

A maximum of 15 hours of the common program courses completed in the College of Engineering may be counted toward the MBA degree program.

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 for acceptance by the College of Business Administration to the Office of Graduate Admissions. 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 Council requires the Graduate Admissions 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 part of the doctoral program, each student is required to serve as a teaching assistant to an undergraduate business 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 also 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 directly to each department or by accessing the College of Business Administration webpage.

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. 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 54 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 advisory committee. 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 13 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 Council 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 Office of the University Registrar.

**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 efforts.

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 Administrative Services Assistant in the Office of Graduate Admissions.

**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.

**Business Administration**

**GRADUATE COURSES**

**501 MBA Career Development (1)** Career opportunities available to each course. Prereq: Admission to MBA program or consent of Assistant Dean of MBA Program.

**506 Enterprise Process Redesign (3)** Enterprise Resource Planning (ERP) software as primary tool for redesigning business processes. Management methods required to facilitate redesign. Change management, consensus management, project management, and implementation methodologies. Configuration of ERP module and business-to-business e-commerce tools. (Same as Information Management 501.)

**510 Customer Responsive Management (3)** Manage-ment 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 organizations, customer service centers and other responsive organizations.

**511 MBA Core I (3)** Essential skills of manager: basic information technology skills, teambuilding, and written and oral communication skills. Finance and accounting fundamentals. Decision tools and techniques. Prereq: Admission to MBA program or consent of Assistant Dean of MBA Program. S/N only.

**512 MBA Core II (15)** Development of roles and responsibilities of business managers. Functional fundamentals: marketing, operations, human resource management. Continuous systems improvement and delivery of customer value. Role of firm in society: stakeholder value, economics, and ethical and legal environment of firm. Personal leadership skills, and assessment of students’ leadership capabilities. Integration of value chain: demand management, operations management, process design and management, and logistics management. Prereq: 511 or consent of Assistant Dean of MBA Program.

**513 MBA Core III (9)** Continuation of the functional fundamentals from 512. Integration of value chain: supply management and resource management. Capstone integrated experience using information technology. Prereq: Successful completion of 512 or consent of Assistant Dean of MBA Program.

**514 Integrated Business Simulation (3)** Computer simulation. Teams manage business within competitive marketplace. Prereq: 511, 512, and 513 or consent of Assistant Dean of MBA Program.


**551 Executive Core I (12)** Integrated course with substantial reading, study and analyses during off-site periods. Determination of business functions through strategic and business process perspective. Application of functional knowledge to tactical and strategic issues. Development of purpose of firm as delivering value to customers and other stakeholders. Ethical issues. Financial and accounting principles. Economic and regulatory environment of business. Human resource and organizational behavior topics in context of business systems and objectives. Personal development for leadership: individual personal skills of
communication, negotiation, leadership and motivation. Customer value and systems management. Case simulations and exercises. Prereq: Admission to executive program of MBA.


561 Management Project I (3) Company project. Preliminary investigation of significant strategic issue (new initiative, program or significant organizational change to enhance organizational effectiveness) in sponsoring organization. Work within firm under guidance of faculty to develop proposal which defines issue and scope of project. Proposal to be approved by company and faculty. Prereq: Admission to executive program of MBA and cooperation of sponsoring organization. Coreq: 551.


593 Directed Independent Study (3) Cross-disciplinary topic of mutual interest to student and faculty. Available only by prearrangement with supervising faculty member. May require approval of Dean of the MBA Program. May be repeated. Maximum 6 hrs. S/NC or letter grade.

599 Executive-In-Residence (3) Interaction with corporate executives from wide spectrum of business disciplines and discussion of domestic and international strategic planning as applied in major corporations. Prereq: MBA core and consent of instructor.

611 Seminar in Theoretical Foundations (3) Theoretical foundations and frameworks common to business research. Historical and philosophical science perspectives.

612 Seminar in Research Methods (3) Research processes: philosophical foundations, problem formulation, grounded theory, qualitative methods and analysis, measurement, sources of error, experimental design and analysis, survey design and analysis.

699 Special Topics (3) Seminars that integrate content from various business functions: international business, management information systems.

Chemical Engineering

(College of Engineering)

MAJOR DEGREES

Chemical Engineering ................. M.S., Ph.D.

John R. Collier, Head

Professors:

Bienkowski, Paul R., Ph.D. ......... Purdue

Associate Professors:

Bruns, Duane D., Ph.D. ............... Houston Chialvo, Ariel (Research), Ph.D. ...... Clemson Cui, ShenTing (Research), Ph.D. ......... Virginia Petrovan, Simoan (Research), Ph.D. ............................... Iasi Tech Pozhar, Ludmilla (Research), Ph.D. ....................................... NAS Ukraine Wang, Tse-Wei, Ph.D. .............. MT Weber, Frederick E., Ph.D. .............. Minnesota

Assistant Professors:

Edward, Brian J., Ph.D. ............. Delaware Frymier, Paul D. (Liaison), Ph.D. ...... Virginia Keffer, David J., Ph.D. .............. Minnesota

Graduate programs lead to the degrees of Master of Science and Doctor of Philosophy in Chemical Engineering with concentrations in chemical engineering, chemical bioengineering, 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, scientific, or business areas (as approved by the departmental faculty); 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 departmental 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 580).

3. A written comprehensive examination over the major field and an oral examination covering the review paper and related areas.

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.

Departmental 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.

CERTIFICATE IN MAINTENANCE AND RELIABILITY ENGINEERING

The College of Engineering offers a certificate program in maintenance and reliability engineering. The program is designed primarily for part-time students in that several of the courses are available through distance education. The 12-credit certificate is earned by completing 483 and 484, which are cross-listed among all participating departments in the College of Engineering, plus two elective
courses selected from a list of courses provided by the participating departments.

Currently, the available elective courses are Chemical Engineering 561, Industrial Engineering 516 and 591, Mechanical Engineering 534 and 599, and Nuclear Engineering 579 and 585. The selection of elective courses is determined through an advising conference with each individual student, and is based on the student's personal interests, academic background, and work experience. Applicants must meet the minimum criteria established by the Graduate Council.

**GRADUATE COURSES**


467 Honors: Engineering Internship in Process Control (1) Students work in small groups on industrial problems in process dynamics and control. Directed by faculty and engineers from host company, Prereq: Process Dynamics and 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 visualization environment. Prereq: Process Dynamics and Control and consent of instructor.

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

501 Graduate Seminar (1) Prereq: Admission to graduate program. May be repeated. S/NC only. F,Sp

502 Registration for Use of Facilities (1-15) 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/NC only. E

505 Engineering Analysis (3) Formulation and solution of problems in chemical engineering and materials areas, ordinary and partial differential equations; types of solution techniques, basic concepts in microelectronics, chemical, biochemistry, reaction kinetics, and biochemical and environmental engineering. Commercial processes like biodegradations wastewater treatment, mass transport, and immobilization methods. Fundamental laboratory techniques during 6-week laboratory period. (Same as Environmental Engineering 542 and Biosystems Engineering 575 and Microbiology 575.)


581 Industrial Pollution Prevention (3) Principles and practical aspects of industrial waste minimization. Regulatory environment, waste minimization strategies, economic analysis, process safety, case study: analysis of pollution abatement and recycling for facilities. Prereq: Graduate standing in engineering or consent of instructor. (Same as Environmental Engineering 581 and Environmental Science 585.)

585 Process System Reliability and Safety (3) (Same as Nuclear Engineering 585.)

590 Special Topics in Chemical Engineering (3) May be repeated. Maximum 6 hrs.

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

631 Advanced Topics in Statistical Thermodynamics and Molecular Dynamics (3) Statistical thermodynamics, molecular based computer simulations. Monte Carlo and molecular dynamic calculations, applications to supercritical fluids, macromolecules and biological systems. Prereq: 532.


642 Advanced Topics in Polymer Processing (3) (Same as Materials Science and Engineering 642.)

647 Advanced Transport Phenomena (3) Theory of mass, momentum, and energy transport in reactive and non-reactive systems. Formulation of transport models useful for application to analysis and design of separation processes, and chemical and biochemical reactors. Prereq: 505, 547.


661 Advanced Topics in Process Dynamics and Control (3) May be repeated. Maximum 6 hrs.

675 Microbial Systems Analysis (3) Identification and analysis of complex microbial systems using perturbation-response methods. Structuring of important mechanistic processes, interactions, and regulation at several systems levels (reactor or macro, ecological, cellular/physiological and molecular). Experimental methods for data gathering, signal resolution and processing, mathematical signal analysis, model development (deterministic, stochastic, phenomenological), and uncertainty and limitations of approach. Prereq: 575 or consent of instructor.

691 Advanced Topics in Chemical Engineering (3) May be repeated. Maximum 6 hrs.

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**Chemistry**

(Also of Arts and Sciences)

**MAJOR DEGREES**

Chemistry ........................................ M.S., Ph.D.

Michael Sepaniak, Head

Professors:

Adcock, J. L., Ph.D. ......................... Texas
Alexandratos, S. D. (Hoechst-Celanese) ....... Prof. of Polymer Science), Ph.D. California
Baker, D. C. (Paul and Wilma Ziegler Prof.), Ph.D. ....................... Ohio State
Barnes, C. E., Ph.D. ....................... Stanford
Bartmess, J. E., Ph.D. ....................... Northwestern
Bloor, J. E. (Emeritus), Ph.D. ................. Manchester
Bull, W. E. (Emeritus), Ph.D. ................. Illinois
Chambers, J. Q. (Emeritus), Ph.D. .......... Kansas
Compton, R. N., Ph.D. ......................... Tennessee
Cook, K. D., Ph.D. ......................... Wisconsin
Eastham, J. F. (Emeritus), Ph.D. ............. California
Fletcher, W. E. (Emeritus), Ph.D. ............. Colorado
Grimm, F. A. (Emeritus), Ph.D. ............... Cornell
Guiochon, G. (Distinguished Scientist), Ph.D. ...... Ecole Polytechnic and Paris VI
Kabalka, G. W. (Robert H. Cole Prof.) .......... Distinguished Prof.), Ph.D. ............ Purdue
Kleinfelter, D. C. (Emeritus), Ph.D. ........... Princeton
Kovac, J. D., Ph.D. ......................... Yale
Larese, J. Z., Ph.D. ......................... Wesleyan (Connecticut)
Lietzke, M. H. (Emeritus), Ph.D. .............. Yale
Magid, L. J., Ph.D. ......................... Tennessee
Margulies, M. J., Ph.D. ...................... Yale
Mays, J. W. (Emeritus), Ph.D. ............ California
Schweitzer, K. G. (Distinguished Prof.), Ph.D. .... Illinois
Sepaniak, M. J., Ph.D. ....................... Iowa State
VanHooke, W. A. (Paul and Wilma Ziegler Prof.), Ph.D. ................ Johns Hopkins
Students majoring in Chemistry for the master’s or doctoral degree are required to present as a prerequisite one year each of general, analytical, and physical 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 thesis, or experimental work on problems not covered in the 500 level or above including at least one concentration) consist of the satisfactory completion of:
1. Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 600. 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. (No more than 2 hours may be applied to the course requirements.)
3. Prescribed remedial courses based on performance on entrance examinations.
4. Sufficient graduate coursework in chemistry (at the 400 level or above) and/or a related field to make an overall total of 30 hours, including one of the following sequences: 510-11-12, 530-31-32, 550-51-52, 570-72-73, 590-94-95. At least 14 hours of this graduate coursework must be at the 500 level or above.
5. A final oral examination.

THE DOCTORAL PROGRAM

The department offers concentrations in eight areas for the Ph.D.: analytical chemistry, chemical physics (in cooperation with the Department of Physics), environmental chemistry, inorganic chemistry, organic chemistry, physical chemistry, polymer chemistry, and theoretical 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 600. 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, 530-31-32, 550-51-52, 53-54, 570-71-72-73, and 590-94-95.
6. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements differ according to student choice in the major department. Chemistry departmental requirements include passing the above degree requirements in chemistry with concentration in chemical physics 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, preparations of modern inorganic compounds for characterization, coordination and organometallic chemistry. Prereq: 230 Inorganic Chemistry. Sp


471-81 Biophysical Chemistry (3) (Same as Biochemistry and Cellular Molecular Biology 471-81) 471-83 Physical Chemistry (3, 3) Students may not receive credit for both 471 and 473 nor for both 481 and 483. 473 - Properties of gases; first, second and third laws of thermodynamics; chemical equilibrium; simple chemical reactions; introduction to statistical thermodynamics; kinetics of chemical reactions; 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. Prereq or coreq: Corresponding courses 471 or 473 for 479 and 481 or 483 for 489. 1 lab. 479-E, 489-Sp

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

501 Chemistry Seminar (1) Lectures and discussion on current research. May be repeated. Continuous registration required for residents graduate students. S, NC only. F, Sp

502 Registration for Use of Facilities (1-15) 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, F

505 Special Problems (3) Specially assigned theoretical or experimental work on problems not covered in other courses. Prereq: Consent of department. May be repeated. Maximum 6 hrs. S, NC only.

510 Analytical Spectrometry (3) Principles and practice of optical and mass spectrometric techniques in quantitative chemical analysis. Prereq: 479-89. F

511 Analytical Separations (3) Principles and practice of chemical separations based on extraction, chromatographic, and electrophoretic phenomena. Required background: Two semesters of physical chemistry.

512 Electroanalytical Chemistry (3) Fundamentals of electrode processes; principles and practice of electroanalytical techniques in quantitative chemical analysis and applied to study of chemical systems. Required background: Two semesters of physical chemistry.

530 Chemical Bonding (3) Wave mechanical atom, group theory, quantum approach to molecular orbital theory, covalent, ionic, and metallic bonding, ligand field theory, solid state. Required background: One semester of inorganic chemistry. F

531 Characteristics of Inorganic Compounds (3) Descriptive chemistry of elements; structure, reactions, kinetics, mechanisms, equilibria, and spectra of coordination, organometallic, bioinorganic compounds. Required background: One semester of inorganic chemistry. F

532 Experimental Methods of Inorganic Chemistry (3) Electronic, infrared, Raman, microwave, NMR, ESR, mass spectrometry and quadrupole, Mossbauer, mass, and photoelectron spectroscopies for characterization of inorganic compounds. Required background: One semester of inorganic chemistry. F

540 Nuclear and Radiochemistry (3) Nuclear properties, radioactivity, radioactive decay processes, nuclear structure and models, nuclear reactions, radiations and their detection. Required background: Two semesters of physical chemistry.

550 Structure and Reactivity in Organic Chemistry (3) Structure and bonding in organic compounds; molecular orbital theory, stereochemistry, conformational analysis, and molecular mechanics; substituent effects on acidity and reactivity. Introduction to reaction mechanisms. Required background: Two semesters of organic chemistry. F


552 Organic Reaction Mechanisms (3) Techniques and principles in study of organic reaction mechanisms; applications and interpretation of polar, pericyclic reactions; reactive intermediates. Prereq: 550. Sp

553 Spectroscopic Characterization of Organic Compounds (2) Organic structure elucidation using spectroscopic methods: nuclear magnetic resonance, infrared, ultraviolet and mass spectrometry. Required background: Two semesters of organic chemistry. F

554 Organic Spectroscopy Laboratory (1) Use of IR, UV, MS and multinuclear FTNMR spectrometers. Development of problem-solving ability in area of spectroscopic characterization of organic molecules. Prereq: 360 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 (5) Prereq: 570. F

572 Thermodynamics and Statistical Mechanics (3) Macroscopic and microscopic 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

590 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles. Required background: Two semesters of physical chemistry.

591 Polymers (3) Fundamentals of polymer chemistry and physical properties. Required background: Two semesters of physical chemistry.


593 Chemical Kinetics and Transport (3) Time-dependent phenomena in chemistry: chemical kinetics, chemical dynamics, transport theory. Required background: Two semesters of physical chemistry. Sp

594 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles. Required background: Two semesters of physical chemistry.

595 Polymers (3) Fundamentals of polymer chemistry and physical properties. Required background: Two semesters of physical chemistry.


597 Chemical Kinetics and Transport (3) Time-dependent phenomena in chemistry: chemical kinetics, chemical dynamics, transport theory. Required background: Two semesters of physical chemistry. Sp

598 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles. Required background: Two semesters of physical chemistry.

599 Polymers (3) Fundamentals of polymer chemistry and physical properties. Required background: Two semesters of physical chemistry.
background: Two semesters each of organic and physical chemistry.


595 Physical Chemistry of Polymers (3) Conformation of macromolecules, solution and bulk properties, rubber elasticity, kinetics of polymerization, polymer thermodynamics. Prereq: 594 or equivalent. Sp

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

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.

630 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: 570-72-73 or 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.

691 Selected Topics in Thermal Analysis of Polymeric Materials (3) Topics of current significance. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. Maximum 3 hrs may be applied toward degree in chemistry.

Assistant Professors:
Brandon, Denise, Ph.D. Tennessee
Devereaux, Matt, Ph.D. Tennessee
Moran, Mary Jane, Ph.D. New Hampshire
Wass, Tara, Ph.D. Denver

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 color, work, varied research experiences, and opportunities for experiences in applied settings.

ADMISSION REQUIREMENTS
A completed file for review includes a departmental application, Graduate Record Examination (GRE) scores for the general section, and completion of three Graduate Rating Forms by individuals who can attest to the applicant’s potential for graduate education. Forms may be obtained from the department.

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 concentrations 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 doctorate degree are best served 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 wish to work with children and families in the community are best served by selecting the non-thesis option. The non-thesis option requires 39 hours of coursework. In addition to the core and specialization courses, CFS 570 is required.

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 and a supervised internship (564 and 565). Master’s students who have completed the child and family life practice specialization by taking an approved set of courses are eligible to make application for full or provisional designation as a Certified Family Life Educator (CFLE) through the National Council on Family Relations. 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.

Students seeking the M.S. with a major in Child and Family Studies must file a plan of study with the department head after 12 hours of graduate credit.

The early childhood education concentration is designed for students seeking initial teacher licensure in early childhood education (Pre-K through Grade 4). 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 Child and Family Studies 569. Students select one course 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 569); and written comprehensive examination (36 credits).

THE PH.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, 691 or 650.
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 24 credits in a cognate area.
10. Minimum of 96 credits beyond the bachelor’s degree.

GRADUATE COURSES

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

502 Registration for Use of Facilities (1-15) 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

505 Development of Interpersonal and Supervision Skills (3) Refinement of interpersonal skills needed to work with families and other professionals. Supervisory training in others’ skill development, active listening, self-disclosure, relationship building, and negotiation. Skills adapted for use among family members.

510 Theory in Human Development (3) Theoretical models of human development: cognitive, social, learning, and ecological theory; analysis, synthesis, and discussion of contemporary relevance of models; application of theory to research, prevention, intervention, and education; critical reading and evaluation of research-based research on human development processes.


512 Survey of Research in Early Childhood Education (3) Current literature and issues in early childhood education. Prereq: S/NC only or consent of instructor.

515 Children in Contemporary Society (3) Theory and research on environmental and developmental influences on contemporary family situations and educational environments for children from infancy through middle childhood. Implications for programs and policy.

521 Organizational Management in Early Childhood Education (3) Designing, implementing, and evaluating policies and human resources in organizational and educational environments. Development of skills in environmental organization, interpersonal leadership, budgeting and supervision of staff. Required background: 6 hrs graduate-level coursework in early childhood education or child development.

522 Naturalistic Interventions for Parents and Teachers of Young Children (3) Common problems faced by parents and teachers; methods available to modify problem behavior.

525 Seminar on Play (3) Comparison and contrast of theoretical framework and research methodologies on play. Developmental perspective on play.

530 Families of Children with Disabilities (3) Developmental nature of families’ experiences in caring for handicapped children, especially during infancy and early childhood.


545 Family Resource Management and Instruction (3) Design and implementation of family resource management curriculum for family life education audiences based on theory and application of managerial functioning in family settings; analysis of goals, resource use, information systems, constraints within families, Observation and analysis of diverse family practices. Prereq: 6 graduate hrs in major, or consent of instructor. May be repeated with different topics. Maximum 9 hrs. E

550 Theory and Research in Family Studies (3) Research in various major topics in family studies and application of theoretical models to understanding research.

552 Diversity in Children and Families (3) Diversity in families including differences in contemporary physical, cognitive, and developmental patterns by race, ethnicity, religion, and social class; social dynamics of family formation, cohabitation, and partnering. Prereq: 550.

555 Children, Divorce and Remarriage (3) Children’s adjustment to divorce, remarriage, and family transitions. Prereq: 550 and 563.


564 Practicum in Human Development or Family Studies I (3) School and community programs. Education for human development and family living. Prereq: Consent of instructor. S/NC only. E

565 Practicum in Human Development or Family Studies II (3) School and community programs concerned with education for human development and family living. Committee approved and supervised written project. S/NC only. E

566 Approaches to Family Intervention and Counseling (3) Various theoretical approaches for family intervention and counseling. Structural, strategic, experiential and social learning schools of practice. Efforts of intervention and their impact on family functioning and communication. Prereq: 562. (Same as Counseling Education and Counseling Psychology 566.)

567 Family Violence (3) Theory and research on initiation, maintenance, escalation and violent behav- iors in intimate family contexts, and assessment of responses to violent family behaviors, perpetrators, victims, and family systems. Prereq: 550.

569 Action Research in Early Childhood Education (3) Participants adjust to all transitions involved in parental divorce, single-parenthood, and remarriage.


571 Research Seminar (1) Presentation and critique of research projects. Prereq: Departmental major or consent of instructor. May be repeated. S/NC only. E

574 Analysis of Teaching for Professional Development (2) Strategies to document and analyze effec- tiveness of teaching and of professional development. Study and application of various approaches. Coreq: 572. E

575 Professional Internship in Teaching (1-6) Intensive teaching and teaching-related experiences in professional settings in public schools. Enrollment limited to postbaccalaureate students in professional yearlong program. Validity, reliability, and program. May be repeated. Maximum 12 hrs. S/NC only. F.Sp

580 Special Topics in Human Development or Family Studies (1-3) Research, theory and current issues in child development or family studies: divorce, handicapped children, symbolic interaction, work and family, Piaget, mainstreaming children, theory and research in human development of the elderly. Prereq: 6 graduate hrs in major, or consent of instructor. May be repeated with different topics. Maximum 9 hrs. E

581 Directed Study in Human Development or Family Studies (1-3) Individual learning experiences in specific major topics in child development and early childhood education or family studies. Prereq: 6 graduate hrs or consent of instructor. May be repeated with different topics. Maximum 6 hrs. E

591 Clinical Studies (1-6) Group and individual semi- nars during full academic year on assessment and evaluation of professional core competencies. Completion and presentation of portfolio and analysis of teaching project. Coreq: 575.

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

610 Advanced Special Topics in Human Development or Family Studies (1-3) Study of research and theory related to current issues. Prereq: 12 graduate hrs in major or consent of instructor. May be repeated with different topics. Maximum 6 hrs.

620 Advanced Directed Study in Human Development or Family Studies (1-3) Advanced, in-depth individualized learning experiences in specific topics in child development, early childhood education, or family studies. May be repeated with different topics. Maximum 6 hrs.


631 Adolescent Development in Families (3) Normative and nonnormative adolescent development: physi- cal, cognitive, moral, social, familial, sexual, and personal growth. Prereq: 510. E

633 Survey Design and Analysis (3) (Same as Sociology 633.)

634 Advanced Survey of Family Theory and Research (3) Conceptualization, analysis, and critical assessment of pertinent conceptual and empirical literatures at advanced level for variety of contemporary family issues. Prereq: 570, master’s core. Required background: 6 hrs graduate-level statistics.

640 Advanced Theory in Human Development (3) Original conceptualizations of and current theoretical perspectives influencing field of human development and empirical evaluations of these perspectives. Prereq: 550, 510, 511, or consent of instructor.

650 Advanced Qualitative Research Methods (3) Techniques and data analysis in qualitative research in human development and family studies. Use of methods: in-depth interviewing, participant observa- tion, and case studies. Prereq: Communications 642 or Psychology 614.


670 Secondary Analysis of Survey Data (3) Applied seminar in secondary analysis of survey data. Iden- tification of data archives, accessing data, evaluation, and analysis of social science survey data. Nationally recognized data sets, evaluation of study of older youth, or children. SPSS analytic software. Prereq: 570 or equivalent, Statistics 532 or 537 or equivalent.

Civil and Environmental Engineering
(College of Engineering)

MAJORS DEGREES
Civil Engineering ......................... M.S., Ph.D.
Environmental Engineering ............... M.S. (Ph.D. through Civil Engineering)

Professors:
Bennett, R. M., PE, Ph.D. ............... Illinois
Burdette, E. G. (Fred N. Peebles Prof.), PE, Ph.D. .......... Illinois
Chatterjee, A., PE, Ph.D. ................. NC State
Davis, W. T., Ph.D. ....................... Tennessee
Deatherage, J. H., PE, Ph.D. .......... Arizona
Drumm, E. C., PE, Ph.D. ................. Arizona
Goodpasture, D. W., PE, Ph.D. .......... Illinois
Grecco, W. L. (Emeritus), Ph.D. ........ Michigan State
Healthington, K. W. (Emeritus), Ph.D. .... Northwestern
Miller, W. A. (Emeritus), PE, Ph.D. .... Tennessee
Ph.D. .......................................... California
Penumadu, D., Ph.D. .................. Georgia Tech
Robinson, R. B. (Fisher Prof.), PE, Ph.D. .......... Tennessee
Tschantz, B. A. (Emeritus), PE, Sc.D. .............. New Mexico State
Urbanik, T., Ph.D. ........................ Texas A&M
Wegmann, F. J., Ph.D. ................ Northwestern

Associate Professors:
Cox, C. D., Ph.D. ......................... Penn State
Han, L. D., Ph.D. ........................ California
Miller, T. L., PE, Ph.D. ................. Pennsylvania
Penumadu, D., Ph.D. ................. Georgia Tech
Richards, S. H., PE, Ph.D. .......... Tennessee
Robinson, K. G., Ph.D. ................ VPI

Assistant Professors:
Chu, K., Ph.D. .......................... California
Huang, B., Ph.D. ......................... Louisiana 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, waste management, and environmental risk assessment. For further information, visit the website at http://www.engr.uky.edu/civil/.

THE MASTER’S PROGRAM

The Master of Science programs in Civil Engineering and Environmental Engineering are offered to graduates of recognized undergraduate curricula.

Departmental requirements provide that for a major in Civil Engineering, the Bachelor's degree must be in civil engineering, or certain undergraduate prerequisite courses must be taken before admission to candidacy for the Master of Science in Civil Engineering.

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 problems is required. The special problems 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 prerequisite courses will be required: Engineering Fundamentals 101, 102; Nuclear Engineering 203 or Mechanical Engineering 391; 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 15 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 18 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 department.

Normally, the graduate program of study will be adjusted 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, a minimum of 24 semester hours in 600 Doctoral Research and Dissertation will be required.
2. A minimum of 24 semester hours of graduate courses in Civil Engineering, exclusive of thesis or dissertation credit, at least 8 hours of which must be 600-level courses.
3. 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 such disciplines as mechanics, chemistry, mathematics, microbiology, physics, and other engineering fields. A minimum of 9 semester hours of mathematics will be required beyond the civil engineering undergraduate requirements.

4. 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.
5. Upon completion of at least one-half of all coursework, each student must pass a comprehensive examination.
6. After completion of the dissertation, prior to graduation, each student must pass a comprehensive examination administered by a 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.

Civil Engineering

GRADUATE COURSES

421 Portland Cement Concrete Mix Design and Analysis (3) Aggregate properties and tests, tests of portland cement and concrete, mix design methods, admixtures, and nondestructive testing. Prereq: 321. 2 hrs 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, 352.
452 Traffic Engineering (3) Characteristics of driver, vehicle, and roadway and their interrelationship; traffic studies; basic considerations of traffic circulation and control, lighting, capacity analysis, roadway safety analysis and design. Prereq: 210, 251, 352.
453 Airport/Railroad Planning and Design (3) Airport master planning and railroad engineering. Runway configuration, airport capacity, geometrics and terminal layout and design. Railroad capacity, geometrics and system layout and design. Prereq: 210, 251, 352.
472 Steel Design (3) Design of plate girders and composite beams; consideration of members subjected to combined stresses; design of typical framed building, connections. Prereq: 471.
474 Reinforced Concrete Design (3) Design of continuous beams, floor slabs, and columns with combined axial loads and bending moments 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 and dam project, data acquisition, spillway and outlet works design; earthen and gravity dam stability analyses; drains and
filters; maintenance and operation principles; and dam safety concepts, dam break analyses. Prereq: 390, 395.

495 Water Resources Development and Management (3) Principles of water resources project development and management. Institutional framework: water law, evaluation procedures for comparing and selecting among water resources development alternatives, public policy, planning, principles of engineering economics, benefit-cost analysis, and cost allocation methods; environmental impact assessment procedures; decisions using risk-based methods; case studies. Prereq: P/S/NC only. S/NC only. E

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

502 Registration for Use of Facilities (1-15) Required for the first time 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 Urban Systems: Engineering and Management (3) Various urban systems usually under responsibility of city manager and/or city engineer: streets, lighting, water, sewer, and/or drainage. Population growth, financial management, finance, planning and public relations. Prereq: Graduate standing or consent of instructor.

521 Pavement Design (3) Theoretical and empirical based methods of pavement design and analysis, strengthening, and rehabilitation. Inelastic, distress and economical design alternatives. Prereq: 321 and 330.

522 Asphalt Concrete Mix Design and Analysis (3) Aggregate properties and tests, tests of asphalt and cement concrete mixes, mix design methods for asphalt concrete, production and placement of hot mix asphalt. Prereq: Materials of Construction, 2 hrs and 1 lab.


532 Rock Mechanics and Rock Engineering (3) Engineering properties and characterization of rock and rock masses. Discontinuity analysis, stress and strain, keyblock theory. Applications to rock engineering and rock engineering: tunneling, underground excavations, foundations and groundwater flow. Prereq: Introduction to Soil Behavior or consent of instructor.

533 Advanced Laboratory and Insitu Testing of Soil (3) Instruments for measurement of electrical signals, static and dynamic transducers, data acquisition and control, insitu measurement of stress, pore pressure, deformation, load deformation behavior (seismic methods, static methods), advanced laboratory shear strength and compressibility testing. Prereq: 330 Introduction to Soil Behavior. 2 hrs and 1 lab.

534 Geological Engineering (3) Influence of geological origin and history on engineering characteristics of rocks and soils; applications 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, discussions, and presentations in geotechnical engineering. Prereq: 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. Confinement and unconfined flow through porous media: stresses and strains in elastic halfspace; representation of nonlinear soil behavior with elastic and elasto-plastic models; soil structure interaction effects. Prereq: Introduction to Geotechnical Engineering and consent of advisor. May not apply toward degree. May be repeated. S/NC only.

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 costs, estimating methodologies and 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/highway safety. Prereq: Graduate standing.

552 Traffic Engineering-Operations (3) Signs, signals and marketing; short-term operations; controllers; signal timing/phasing; one-way reversible flow; system operations; identification and correction of high accident locations and system deficiencies. Prereq: 551 or 452.

553 Geometric Design and Layout of Roadways and Community Facilities (3) Functional and geometric design and layout of urban roads of all classes; subdivision layout; configuration of urban roads of all classes; techniques for access control; freeway interchange design; traffic intersections; and parking. 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 and scheduling; cost analysis; mode choice 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; analysis of accidents and crash testing. Prereq: 452 or graduate standing.

557 Transportation Planning and Operations with Micro-Computer Applications (3) Transportation systems management techniques and application of micro-computers to analysis of transportation actions. Prereq: 551 and 556.

558 Planning and Transportation (3) Preparation of transportation as elements of comprehensive development plans. Analysis of relationship between various transportation modes and between transportation and other community features. Use of planning process to establish existing travel patterns, modeling of demand, proposed projects and alternatives; limit analysis; Graduate standing. (Same as Planning 537.)

561 Computer-Aided Structural Analysis (3) Fundamental concepts of computational methods used in structural analysis; matrix and finite element methods; practical application of structural analysis software. Prereq: Structural Analysis and Matrix Computation or equivalent.

562 Structural Systems (3) Structural system analysis and design; dead, live, wind, and earthquake loads on structures. Design of foundations, beams, columns, trusses; use of computers in analysis and design. Prereq: Introduction to Structural Design.

563 Statically Indeterminate Structures (3) Elastic analysis of indeterminate articular and rigid frames with non-prismatic members using energy, slope deflection, and moment distribution methods; plastic analysis of rigid frames; and stability analysis of compression 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; elastoplastic behavior considered for structural systems; earthquake design and response of structures. Prereq: Introduction to Structural Design.

571 Behavior of Steel Structures (3) Behavior of structural steel members due to static and fatigue loads. Identification and prevention of unsafe conditions. Prereq: 471.

572 Fracture Analysis (3) (Same as Geology 572.)

573 Prestressed Concrete (3) Properties of prestressing materials; methods of pretensioning and posttensioning; analysis and design of simple and continuous beams and slabs. Prereq: 471.

574 Behavior of Reinforced Concrete Members (3) Moment-curvature and load-deflection relationships for reinforced concrete beams; combined bending and axial load; shear and torsion; relation between research results and specifications for design. Prereq: 471.

576 Masonry Design (3) Clay and concrete masonry materials; unreinforced masonry design; reinforced masonry design; seismic behavior of masonry structures. Prereq: Introduction to Structural Design.

580 Risk Analysis in Civil and Environmental Engineering (3) Applications of probability theory and statistics in civil engineering studies, structures, geotechnical and geological engineering. Water resources, transportation, and environmental engineering. Prereq: Calculus II or consent of instructor.

590 Special Problems in Civil Engineering (1-6) Enrollment limited to civil engineering students in non-thesis programs. May be repeated. Maximum 6 hrs. S/NC only.

595 Special Topics (1-4) Problems and topics related to current developments in field. May be repeated. Prereq: Consent of instructor.

600 Doctoral Research and Dissertation (1-15) Pr/NP only. E

631 Soil Dynamics (3) Introductory and advanced topics: vibrations of elementary systems, foundations subjected to repeated and impulse loading, wave propagation theory and applications, and site response to dynamic loading. Prereq: 435 Foundation Engineering.

651 Analysis Techniques for Transportation Systems I (3) Analysis of trip generation, trip distribution, modal split and traffic assignment; travel demand, and transportation systems. Mathematical, statistical, and computer science techniques. State of the art and new modeling techniques. Prereq: 554 or 558.

652 Analysis Techniques for Transportation Systems II (3) Advanced topics of application of mathematical, statistical, and computer science techniques in modeling and analysis of transportation systems. Prereq: 551.

671 Behavior of Steel Bridges and Buildings (3) Behavior, analysis and design of plate girders, columns, and composite members subjected to static and dynamic loading. Prereq: 571.

674 Behavior of Reinforced Concrete Beams and Slabs (3) Strength and behavior of statically indeterminate reinforced concrete beams and slabs; limit analysis; behavior, analysis, and design of reinforced concrete slabs; yield-line theory, finite element solutions, and ACI Code Method. Prereq: 574.

680 Reliability of Constructed Systems (3) Development of safety factors and probability based design codes; Monte Carlo methods; constructed system reliability; evaluation of existing infrastructures. Prereq: 551 or 571.

691 Special Topics in Civil Engineering (3) Selected advanced problems of current interest. Prereq: Consent of instructor. May be repeated.
Environmental Engineering

GRADUATE COURSES

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

502 Registration for Use of Facilities (1-15) Required for the student to be 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

508 Seminar (1) Reports on current research in environmental engineering at UT. Prereq: Graduate standing.

510 Environmental Protection (3) Managing of water resources, wastewaters, air quality, solid wastes, and hazardous materials to promote efficiency and comfort and to safeguard balances in natural ecosystems. Prereq: Consent of instructor.

520 Open Channel Hydraulics (3) Open channel flow principles, properties, and classifications; uniform and gradually varied flow; flow-pipe design; orifice design; channel design; unsteady flow theory and analysis: dynamic routing; spatially varied flow; non-linear alignment and cross-section applications, featuring 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 hydrology and hydraulics, HEC-1, HEC-2: floodway encroachment, flood hazard zone and damage potential determinations; cast studies. Prereq: Hydraulics or consent of instructor for non-majors.

524 Sediment Transport (3) Sediment properties and measurements; principles of dynamics of suspended and bed sediment transport in erodible channels; erosion, transportation, and deposition of sediment by flowing water; erodible channel design; channel regime theory; common computer models. Prereq: Hydraulics.

525 Soil Erosion and Sediment Yield (3) Theory of soil erosion and sediment yield processes from disturbed land; methods and computer models for estimating erosion and sediment yield; soil erosion theory and management practices. Local and state regulations. Prereq: Civil Engineering 395. (Same as Biosystems Engineering 529.)

530 Urban Hydrology and Stormwater Engineering (3) Planning, design, modeling, management, and maintenance of urban stormwater systems. Theory and application of hydraulic and hydrologic principles to design of stormwater management systems; design of inlet structures, conveyance systems, detention/basin systems, and appurtenances, and selected best management practices (BMP's); evaluation of land-use changes of runoff quantity and quality; review, selection and application of contemporary computer models. Prereq: Hydraulics. Hydrology.

535 Ground Water Hydrology (3) Dynamics of flow and contaminant transport in porous media: hydrodynamics, dispersion, anisotropy, layered soils, unsaturated flow and groundwater contaminant transport phenomena. Analytical and numerical solution of flow and transport equations. Prereq: Hydraulics and Hydrology or Civil Engineering 485 for geology majors. (Same as Geological Sciences 535.)

543 Instrumentation and Measurement (3) (Same as Biosystems Engineering 543.)

545 Monitoring Hydrologic Phenomena (3) (Same as Biosystems Engineering 545.)

551 Physicochemical Unit Processes (3) Theory and design in chemical and physical water treatment processes. Prereq: Water and Waste Treatment, and Hydraulics.

552 Biological Treatment Theory (3) Theory and design applications of biological processes to treatment of wastewater and solid wastes. Prereq: Water and Waste Treatment, and Hydraulics. (Same as Biosystems Engineering 552.)

553 Aquatic Chemistry (3) Theoretical, applied and analytical chemistry related to generation, measurement and treatment of environmental contaminants. Prereq: General Chemistry 2 hrs and 1 lab.

554 Environmental Engineering Chemistry (3) Application of chemical principles to the study of environmental chemistry, or biological interactions of chemical contaminants in various environmental compartments: atmosphere, hydrosphere, and lithosphere. Prereq: One year chemistry and consent of instructor.

555 Solid Waste Management (3) Magnitude and characteristics of solid waste problems: collection systems; design of disposal systems: landfill, incineration, composting, design of resource recovery systems; current and future regulations. Prereq: Senior standing.

556 Hazardous Waste Management (3) Analysis and design of operations and processes for hazardous waste disposal and processing; regulations; industrial applications. Prereq: Graduate standing or consent of instructor.

557 Hazardous Waste Site Remediation (3) Advanced study of processes for hazardous waste site remediation: soil vapor extraction, soil washing, chemical destruction, thermal destruction, bioremediation. Prereq: 556 or consent of instructor.

570 Air Quality Management/Pollution Control (3) Introductory course on concepts of air pollution, analysis of relationships among sources, meteorology, effects; stack sampling; emission control systems. Prereq: Consent of instructor.

571 Design of Air Pollution Control Systems (3) Design and evaluation of systems used to control emission of gaseous and particle air pollutants. Comprehensive design of specific devices and systems. Prereq: 570.

572 Air Quality Dispersion Modeling (3) Diffusion in atmosphere; application of atmospheric dispersion models and evaluation of meteorological and air quality data. Prereq: 570.

573 Sampling of Air Pollutants (3) Standard sampling methods for particulate and gaseous air pollutant emissions from industrial processes; ambient air monitoring instrumentation/techniques. Prereq: 570.

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

581 Industrial Pollution Prevention (3) (Same as Chemical Engineering 581 and Engineering Science 585.)

590 Special Problems in Environmental Engineering (1-6) Enrollment limited to environmental engineering students in non-thesis program. Prereq: Graduate standing. May be repeated. Maximum 6 hrs. S/NC only.

595 Special Topics (1-4) Problems and topics related to current developments in field. May be repeated.

620 Advanced Surface Water Hydrology (3) Advanced topics in surface water hydrology; solutions in St. Venant equations of unsteady flow for complex channel situations; dam breach modeling. Prereq: 520.

651 Industrial Waste Unit Operations and Processes (3) Theoretical design and laboratory modeling of industrial waste treatment processes and operations. Prereq: 551, 553. Prereq or coreq: 552. 2 hrs and 1 lab.

653 Pollutant Fate Modeling and Risk Assessment (3) Application of scientific principles concerning movement and fate of chemicals at interfaces of air, water, and earthen solids in environment. Methods of assessing risk posed by presence of those chemicals. Prereq: 551.

691 Special Topics in Environmental Engineering (3) Selected advanced problems of current interest. Prereq: Consent of instructor. May be repeated.
The program is flexible and will accommodate a wide variety of career goals in communications. New students may be admitted to the program at any time; however, core courses begin only in the fall semester. Orientation attendance is required. 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 (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 statistics; 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.

Planned 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
field, Media's reporting of health issues. Setting of 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.


590 Project (3) Capstone project under guidance of faculty. Application of principles from previous coursework. S/NC only.

593 Seminar in Mass Communications Issues (3) Contemporary topics in communications. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

597 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/NC only.

612 Fundamentals of Communications Research (3) Universal process from defining ideas and problems to reporting results. Causal inference and statistical strength of association among variables. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

620 Seminar in Mass Communications Education (3) Role and scope of mass communications teaching unit, historical trends, current 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. Sp

622 Quantitative Research (3) Techniques for evaluation of research design and measurement. Survey, content analysis, and experimental techniques. Assesment of reliability and validity. Data analysis, hypotheses testing, and inference strategies. Prereq: 612. F

632 Mass Communications History and Historiography (3) Origins and development of mass media in America. Philosophies of history. Historical sources and their verifications. Synthesis and interpretation of data. Prereq: 612 or consent of instructor. Su

640 Mass Communications Theory I (3) Selected research hypotheses, and theories in literature of mass communication theory. Prereq: Consent of instructor or admission to program. F

641 Mass Communications Theory II (3) Selected topics in theory. Critical evaluation of extant theory, development of hypotheses, and advanced theory construction. Prereq: 640. Sp

642 Qualitative Research (3) Theory and application of qualitative research methods to social science and communications research. Theoretical considerations undergirding symbolic interactionism as translated into research strategies of participant observation, life history, interviewing, archival analysis, and case studies. Prereq: 612 or consent of instructor. Su

652 Mass Communications Law and Legal Research (3) Legal restrictions under which mass media operate. Finding, interpreting and analyzing sources of legal information. Prereq: 612 or consent of instructor. Sp

692 Advanced Topics in Communications Theory and Methods (3-15) Problems and issues of mass communication, theories and methods. May use quantitative, qualitative, historical or legal approaches. May be repeated. Prereq: 622, 632, 642 or 652 or consent of instructor.

Comparative and Experimental Medicine (Office of the Provost)

MAJOR DEGREES

Comparative and Experimental Medicine ............... M.S., Ph.D.

Robert N. Moore, Director

Joint Graduate Coordinating Committee:

Bartges, Joe, D.V.M., Ph.D., Veterinary Teaching Hospital
Karlstad, M.D., Ph.D., Anesthesiology
Lawler, J. E., Ph.D., Psychology
Lozzio, C., M.D., Medical Biology
Moore, Robert N. (Liaison), 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 pathology, 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.vet.utk.edu.

ADMISSION REQUIREMENTS

Admission requirements of the Graduate Council 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.
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 professional degree in one of the medical sciences (e.g., M.D., D.D.S., DVM) or a master’s degree in one of the biomedical sciences and a Graduate Record Examination score of at least 1000 for the quantitative and verbal sections.

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 graduate 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

Core courses are required for the program. A basic science and/or applied science concentration must be selected at the first meeting of the student’s master's committee. For the basic science concentration, students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 6 credit hours of 500-level biochemistry or cell biology. See listings under the Biochemistry and Cellular and Molecular Biology program for information on these courses. For the applied science concentration, students must take at least 6 credit hours of 600-level epidemiology and at least 5 credit hours of 500- or 600-level statistics. 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 disease or biochemistry of diseases. At least 24 hours of coursework, including a minimum of 6 hours at the 600 level, and 24 hours of Dissertation 500 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 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 programs allows legal residents of some states to enroll in certain programs at UT on an in-state tuition basis. The Veterinary Pathology, Comparative Medicine, Microbiology, 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 (1-15) 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

503 Predictive Toxicology (3) Principles and techniques of predictive toxicity: 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

506 Experimental Animal Surgery (3) Competence in performing humane surgical modifications of experimental animals. Techniques of anesthesia. Drug administration and postoperative care. Prereq: Embry-
**Comparative Medicine**

*See College of Veterinary Medicine and Comparative and Experimental Medicine.*

**Computer Science**

*(College of Arts and Sciences)*

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<th>MAJOR</th>
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<td>Computer Science</td>
<td>M.S., Ph.D.</td>
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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
Thomason, Michael G., Ph.D. .... Duke

Ward, Robert C., Ph.D. .......... Virginia

Associate Professors:

Beryl, Michael W., Ph.D. .......... Illinois
Gregor, Jens, Ph.D. .......... Aalborg *(Denmark)*
MacLennan, Bruce J., Ph.D. ......... Princeton
Vander Zanden, Bradley, Ph.D. ........ Cornell

Vose, Michael D., Ph.D. .......... Texas

Assistant Professors:

Huang, Jian, Ph.D. ................. Ohio

Straight, David W., Ph.D. .......... Texas

**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, 550 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 to prepare 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 departmental 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 assessing the student’s potential for advanced work in computer science (for example, college teachers or employers for whom the student has worked after earning a Bachelor’s degree). The department reserves the right to contact these individuals or other knowledgeable people if additional information is deemed necessary or desirable.

2. The student is expected to have taken the GRE verbal and quantitative general test within the past three years and to have these scores sent to the Office of Graduate Admissions.

3. The student should satisfy the same background requirements as for the master’s program. See the departmental brochure for details.

Original research reported in a dissertation of high quality is emphasized. The minimum hour requirements are 24 hours of course 600 Doctoral Research and Dissertation and 24 hours of graduate courses beyond the equivalent of a master’s degree (i.e., beyond 30 graduate credit hours) graded A-F. Computer Science 530, 560 and 580 are required for the degree. At least six hours of 600-level graded courses must be taken in computer science at UT. The student’s advisor and committee will establish the specific course requirements. The comprehensive examination consists of a departmental written examination and a subsequent oral examination conducted by the student’s committee.

**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.

460 **Advanced Topics in Software 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.

470 **Advanced Topics in Scientific Computation** *(3)*

Numerical methods, supercomputers and computer modeling and simulation of physical systems. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.
Consumer and Industry Services Management

(Majors of College of Human Ecology)

**MAJORS**

**DEGREES**

Human Ecology .................................. Ph.D.
Recreation, Tourism and Hospitality
Management ........................................ M.S.
Textiles, Retailing and Consumer
Sciences ............................................ M.S.

Nancy B. Fair, Head

Professors:

Bressee, Randall R. (Liaison), Ph.D. ..................... Florida State
Collier, Billie J., Ph.D. .............................. Tennessee
Duckett, Kermit E., Ph.D. ............................ Tennessee
Fair, Nancy B., Ph.D. ............................... NC State
Fairhurst, Ann E. (Liaison), Ph.D. ...................... Oklahoma State
Hayes, Gene A. (Liaison), Ph.D. ........................... North Texas State

Associate Professors:

Bhat, Gajanan, Ph.D. ............................ Georgia Tech
Blanton, Mary Dale, Re.D. ....................... Indiana
Costello, Carol, Ph.D. ............................. Tennessee
Krick, Ken L., Re.D. ............................... Indiana
Smith, Bridget, M.S. ............................... NC Greensboro
Wise, Dena, Ph.D. ................................. Texas A&M

Faculty Research:

Chen, Rachel, Ph.D. .............................. NC State
Lin, Li-Chun, Ph.D. ............................... Kansas State
Paige, Rosalind, Ph.D. ............................. Iowa State
Platenberg, Carl, Ph.D. ............................. Tennessee
Young, Allison, Ph.D. ............................. Minnesota

The Department of Consumer and Industry Services Management offers the master’s degree with majors in Textiles, Retailing and Consumer Sciences, concentrations in textile science and in retail algorithms and applications, and in Recreation, Tourism and Hospitality Management, concentrations in therapeutic recreation, recreation administration, tourism, and hospitality management.

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 Application for Admission file, Department of Consumer and Industry Services Management application, Graduate Record Examination (GRE) scores for the general section, and three Graduate 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 Council, 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 by concentration.

**Retail and Consumer Sciences (Thesis)**

Services Management: Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 532, Recreation and Tourism Management 510
Internship 3-6  
Elective 3-6  
Total 39

THE PH.D. CONCENTRATIONS

Retail and Consumer Sciences

Students enrolled in the Ph.D. program with a concentration 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  
Research Methods: 590, 616  
Statistics 12-15  
Cognate Area 9  
Human Ecology 630  
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 9  
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.

CERTIFICATE IN SERVICES MANAGEMENT

The Department of Consumer and Industry Services Management offers a certificate program in services management for students seeking continuing education and career advancement opportunities in the services industry.

The 12-credit hour certificate is available by completing the following courses: Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 532, and Recreation and Tourism Management 510.

Hospitality Management (Non-Thesis)

Services Management: Retail and Consumer Sciences 541, 539, Hotel and Restaurant Administration 532, Recreation and Tourism Management 510  
Research Methods: Retail and Consumer Sciences 562  
Statistics 3  
Cognate Area 6  
Hotel and Restaurant Administration 532  
Research Methods 6  
Total 37

Professional Paper/Project: Retail and Consumer Services Management 415 or 440, 510, 515, 540, 541  
Safety Education 443 3  
Sport Management 512 3  
Research Methods 3  
Elective 3  
Total 33

The major in Recreation, Tourism and Hospitality Management requires 33-36 hours for the thesis option and 36-39 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 (Thesis)

Services Management: Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 532, Recreation and Tourism Management 510  
Research Methods: Retail and Consumer Sciences 562 3  
Statistics 3  
Cognate Area 6  
Hotel and Restaurant Administration Elective 6  
Thesis 6  
Total 37

Hospitality Management (Non-Thesis)

Services Management: Retail and Consumer Sciences 541, 539, Hotel and Restaurant Administration 532, Recreation and Tourism Management 510  
Research Methods: Retail and Consumer Sciences 562 3  
Statistics 3  
Cognate Area 6  
Hotel and Restaurant Administration 532 3  
Elective 3  
Total 37

For a description of courses in the hospitality management concentration, see Nutrition.

Recreation Administration (Thesis)

Recreation and Tourism Management 415 or 440, 510, 515, 540, 541  
Safety Education 443 3  
Sport Management 512 3  
Research Methods 3  
Elective 3  
Thesis 6  
Total 33

Recreation Administration (Non-Thesis)

Recreation and Tourism Management 415 or 440, 510, 515, 540, 541  
Safety Education 443 3  
Sport Management 512 3  
Research Methods 3  
Elective 3  
Total 33

Recreation and Tourism Management 420 or 425, 510, 515, 520, 521, 522  
Research Methods 3  
Statistics 3  
Elective 3  
Total 33

Recreational Recreation (Non-Thesis)

Recreation and Tourism Management 420 or 425, 510, 515, 520, 521, 522  
Research Methods 3  
Statistics 3  
Thesis 6  
Total 36

Tourism (Thesis)

Recreation and Tourism Management 470, 510, 515 9  
Hotel and Restaurant Administration 532, 542, 555 or Planning 540 9  
Marketing 510 3  
Planning 548 or 550 3  
Research Methods 3  
Statistics 3  
Thesis 6  
Total 36

Tourism (Non-Thesis)

Recreation and Tourism Management 470, 510, 515 9  
Hotel and Restaurant Administration 532, 542, 555 or Planning 540 9  
Marketing 510 3  
Planning 548 or 550 3  
Research Methods 3  
Statistics 3

*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.

CERTIFICATE IN SERVICES MANAGEMENT

The Department of Consumer and Industry Services Management offers a certificate program in services management for students seeking continuing education and career advancement opportunities in the services industry.

The 12-credit hour certificate is available by completing the following courses: Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 532, and Recreation and Tourism Management 510.
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 Administrative Services Assistant in the Office of Graduate Admissions. 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 (1-15) 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

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, S

532 Human Resource Management in Services Industry (3) Analysis of significant organizational processes and practices in management of human resources within consumer product and service industry. F

534 Special Topics in Foodservice and Lodging Administration (1-3) Lecture/discussion. Contemporary developments and trends in industry. Prereq: Consent of instructor. May be repeated. E

535 Directed Study in Foodservice and Lodging Administration (1-5) Problems selected for study by student with guidance of faculty mentor. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

537 Seminar in Foodservice and Lodging Administration (1-3) 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 strategy: 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: 531, 532, Sp,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 principles at state and federal levels which impact industry. Prereq: Hospital- ity 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 administration; planning, operation and maintenance of 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 leisure and tourism services offered by public, private and/or commercial enterprises. Organizational structures, personnel management, evaluation of 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 Foundations of Leadership, junior standing or consent of instructor. Sp

450 Special Topics in Leisure Education and Tourism (1-6) Specialization of specific topics in recreation, therapeutic recreation and tourism. May be repeated. Maximum 6 hrs. E

470 Tourism and Leisure Industries (3) Symbiotic relationship between tourism and various sectors of leisure industry. Use of resources, both natural and developed, and economic impacts of ventures. Socio-cultural 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 (1-15) 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 Trends and Issues in Services Management (3) Examination of current and emerging trends and issues in consumer product and service industries. Implications of trends and their managerial and strategic applications in services management. F

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 to 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 assertiveness training in therapeutic recreation, relationship of leisure education to therapeutic recreation. Prereq: 520 or consent of instructor. Su


540 Fiscal Policies for Recreation and Sports Related Organizations and Facilities (3) Application of fiscal policies and procedures to operation of recreational and sports related organizations and facilities. Finance, revenue generating strategies, cash and inventory control, commercial/public cooperative ventures and microcomputer applications. Prereq: 430 or consent of instructor. Sp

541 Management and Operation of Recreation and Sport Related Facilities (3) Research for making program and management decision, process of cost analysis, legal 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 hour credit. Work experience, evaluation by agency and university and written paper required. E

591 Directed Study in Leisure & Recreation (1-6) Detailed study of theme, issue, or concern. Designed to meet needs of individual students. May be repeated. Maximum 6 hrs. E

592 Special Topics in Recreation & Leisure Studies (1-6) May be repeated. Maximum 6 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 private and public sectors. Required background: Introductory economics.


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

501 Professional Project (3-6) Application-oriented, capstone project which could be taken 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. E

502 Registration for Use of Facilities (1-15) 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 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.


538 Consumer Product and Service Development (3) Critical analysis of consumer product and service development process in services industry. Strategies for developing consumer products, services, programs, and service processes from conception to implementation and evaluation.

541 Consumer Analysis in Services Management (3) Analysis of consumer behavior in consumer products and services industry. Development of knowledge to positively impact services marketing organizations through marketing, environmental and product/service strategies based upon consumer behavior knowledge. Investigations of qualitative and quantitative methodologies to conduct elementary consumer research.

562 Research Methods (3) Fundamentals of science method, development of scientific methodology and research methods. Issues and concepts of basic and applied research. Prereq: Statistics 531 or equivalent.

590 Research Seminar (1) Research topics in retail and consumer sciences. May be repeated. S/NC only.

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 retailing, consumer affairs, entrepreneurship, sales 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) P/NP 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 501, 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 538, 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 for consumer issues and policy alternatives. Literature and research focus. Prereq: 550 or consent of instructor.

652 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.

Textile Science

GRADUATE COURSES

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

502 Registration for Use of Facilities (1-15) 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 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/or fabrics in woven and nonwoven final performances. Prereq: Organic Chemistry or consent of instructor.

526 Nonwovens Science and Technology II (3) Interrelations between mechanics of production and mechanical properties of nonwoven fabrics; characterization of fiber morphology and web structure; chemistry of nonwoven binders and finishes; 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 development and properties of different types of webs. Prereq: 510 and 521.

552 Economics of Textile Complex (3) Economics consideration of U.S. textile complex. Quantitative 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; micro economics. F.A.


590 Research Seminar (1) Research topics in textile science. May be repeated. S/NC only. F.Sp.

593 Directed Study (1-3) Individual problems in textile science. Prereq: 9 hrs textiles graduate coursework or consent of instructor. 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. May be repeated. Maximum 9 hrs.

600 Dissertation (3-15) P/NP 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.

Counseling, Deafness and Human Services

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

502 Registration for Use of Facilities (1-15) 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 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/or fabrics in woven and nonwoven final performances. Prereq: Organic Chemistry or consent of instructor.

526 Nonwovens Science and Technology II (3) Interrelations between mechanics of production and mechanical properties of nonwoven fabrics; characterization of fiber morphology and web structure; chemistry of nonwoven binders and finishes; 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 development and properties of different types of webs. Prereq: 510 and 521.

552 Economics of Textile Complex (3) Economics consideration of U.S. textile complex. Quantitative 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; micro economics. F.A.


590 Research Seminar (1) Research topics in textile science. May be repeated. S/NC only. F.Sp.

593 Directed Study (1-3) Individual problems in textile science. Prereq: 9 hrs textiles graduate coursework or consent of instructor. 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. May be repeated. Maximum 9 hrs.

600 Dissertation (3-15) P/NP 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.
Theories and re-
Education and Counseling (3)

410 Gender Role Development: Implications for
GRADUATE COURSES
and Counseling
Counselor Education

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 (1-15) 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

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 academic unit on topics of current interest. May be repeated. Maximum 15 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 statis-
tics, research design, and quantitative basis of testing.

525 Formal Measurement in Education and Coun-
seling (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: educa-
tion, 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, coun-
selor role in relation to school staff and mental health
professionals, and ethics of profession. F

551 Theory and Practice of Counseling (3) Philo-
sophical bases of helping relationships; development
of counselor and client self awareness; counseling
theory/techniques. F,Su

552 Career Development: Vocational Theory, Re-
search and Practice (3) Relationships of vocational
theory, career development research and societal
factors to life career roles. F

553 Career and Educational Information Systems
and Resources (3) Use of print and non-print mate-
tials; computer-based systems, for career and educa-
tional planning. Prereq: 552 or consent of instructor and
Internet access account. Sp

554 Group Dynamics and Methods (3) Theory
and types of groups, descriptions of group practices,
methods, dynamics and facilitative skills, supervi-
sion of leadership skills. E

555 Practicum in Counseling (3) Supervised prac-
tice and application of counseling skills with individual
clients. Prereq: Admission to program, 431, 525, 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, certifica-
tion requirements, and role identity. F, Sp

558 Internship in School Counseling (1-6) Super-
vised 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 aca-
demic unit approved human services agency. Prereq:
Admission to community agency program, 555 and
consent of instructor. May be repeated. Maximum 12
hrs. S/NC only. E

561 Development and Operation of School Coun-
seling Programs (3) Management of comprehensive
school counseling programs to include needs assess-
ment, program goals, resource identification, evalua-
tions, and use of computer-based program manage-
ment 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.

566 Approaches to Family Intervention and Coun-
seling (3) (Same as Child and Family Studies 566.)

570 Cross-Cultural Counseling: Theory and Re-
search (3) Theory and research on issues and prob-
lems in counseling of clients from different cultural
backgrounds in U.S. and abroad. Sp

571 Individual Cognitive Assessment in Counsel-
ing (3) Basic concepts and applications in individual
assessment of intelligence; proficiency in administra-
tive scoring, interpretation for Wechsler, adults and
children. Stanford-Binet. Prereq: 525 and 520 and
admission to counseling program or consent of instruc-
ator. S/NC only. Sp,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.)

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 theoreti-
cal problems in educational counseling psychol-
ology. May be repeated. Maximum 12 hrs. S/NC only. E

604 Special Topics (1-3) Instructor-initiated courses
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 studies 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 Edu-
cational Psychology 635.) Sp

650 Seminar in Counseling Education (1) Profes-
sional issues related to role and function of counselor
educators. Prereq: Admission to doctoral program in
counselor education. May be repeated. Maximum 2hrs.
S/NC only. F

655 Practicum in Counseling Education (3) Su-
 pervised 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 Counseling Education (1-6) Super-
vised employment in academic unit approved inter-
site or on-line counseling setting. May be repeated.
Maximum 12 hrs. S/NC only. E

661 Education Implications of Neuropsychology
(3) Theory and assessment. Common syndromes and
their behavioral and cognitive manifestations. Prereq:
316, and 541 or equivalent individual assessment
course; or consent of instructor. Sp,A

662 Applied Research Design (3) Planning of empiri-
cal investigations, collection of data, and drawing of
inferences from evidence gathered. Prereq: Two-
course sequence in statistics. F

670 Foundations of Counseling Psychology (3)
History, theory, research and practice of counseling
psychology. Prereq: Admission to counseling psychol-
ogy doctoral program. May be repeated. Maximum 6
hrs. F, Sp

671 Personality and Vocational Assessment (3) Use
and interpretation of personality and vocational meas-
ures in assessment of clients. Prereq: 525, 552 or
consent of instructor. A

672 Psychological Dysfunction (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 Coun-
seling (3) Theories and supervised practice. Prereq:
525, 555, or consent of instructor. F

674 Practicum in Counseling Psychology (3) Su-
 pervised practice of individual counseling. Minimum 135
clock hrs required each semester. Prereq: Admission
to counseling psychology doctoral program, 555, and

*Program is currently not accepting new students.

See Education under Fields of Instruction for full description of all degree requirements.

The M.S. in Counseling and Ed.S. degree program with their respective concentrations are accredited by the Council for Accredita-
tion of Counseling and Related Educational Programs. In addition, the counseling
psychology concentration under the college-
wide Ph.D. program is accredited by the
American Psychological Association, and the
concentration in counselor education is
accredited by the Council for Accreditation of
Counseling and Related Educational Pro-
grame. The department includes several
educational programs sponsored by the U.S.
Department of Education, Office of Special
Education and Rehabilitative Services,
Rehabilitation Services Administration,
including: Regional Rehabilitation Continu-
ing Education Program, Orientation to Deafness,
Southeastern Regional Interpreters Training
Consortium, National Interpreter Training
Center, and the Educational Interpreting
Program.

The department emphasizes research-
based practices that address the growth and
development of the whole person throughout
the lifespan. In its counseling programs, it
concentrates on maximizing development and
adjustment of individuals through prevention
and treatment models in schools, colleges,
community agencies, businesses, and
private-practice settings. In its rehabilitation
programs, it pursues improvement in the
quality of life for persons with disabilities and
enhances the role of counselor. It also focuses
research interests on the develop-
ment of new knowledge and technology to
meet the unique educational, social, and
employment needs of this population. A major
goal of the department is the preparation of
graduates for future leadership and
professional roles in business and industry,
education, and community and government
service.

The application deadline for admission to
the doctoral and Ed.S. programs is February
1; and November 1 and February 1 for the
master’s program.

ADMISSION REQUIREMENTS

Admission requirements include up-to-
date scores from the GRE for the major in
Counseling, a departmental admissions
application form and letters of rec-
ommendation. For the doctoral program, a
writing sample is also required.

Counselor Education
and Counseling
Psychology

GRADUATE COURSES

410 Gender Role Development: Implications for
Education and Counseling (3) Theories and re-
search: development of gender roles and their
relevance to identity and behavior in socio-psychologi-
cal, 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
Rehabilitation and Deafness

GRADUATE COURSES

415 Language Development of Deaf/Hard of Hearing (3) Language problems of hearing impaired children, contrastive linguistics, and sequence of normal language development. Formal linguistic systems used to describe language development problems.

416 Language Development of Deaf/Hard of Hearing II (3) Developmental and remedial systems of teaching language to hearing impaired children. Comprehension and production differences, idiomatic and figurative structures. Prereq: 415 or consent of instructor.

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 audiometric services to medical and other rehabilitative 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, communication skills, language development, and education of hearing impaired. Survey of literature. Visits to programs.

431-32 American Sign Language III, IV (3,3) Fluency of expressive 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: 426; 431 for 432 or consent of instructor.

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

502 Registration for Use of Facilities (1-15) 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 Clinical Experience in Teaching an Exceptional Children (3-9) (Same as Special Education 504.)

509 Vocational Guidance and Career Planning With Hearing Impaired (3) Utilization of psychological, vocational, and educational resources and 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/NP only. E

523 Practicum with Deaf/Hard of Hearing (3) Receptive and expressive language capabilities of hearing impaired student. Designing, teaching, and post-testing unit of instruction for remediation of specific language errors.


529 Teaching Reading to Deaf/Hard of Hearing (3) Specific methodology necessary to teach reading to hearing impaired student. Practice in preparation of developmentally appropriate reading materials. 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, plan development, and provision of services to people who have disabilities and vocational handicaps. Identification, mobilization, and utilization of rehabilitative 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 or private rehabilitation facilities. 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-servicing techniques; legislation impacting 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 of relevant psychometric instruments; integration of statistical data into diagnostic reports; application of computer-generated reporting systems.

537 Vocational Evaluation: Clinical Methods (3) Process, principles, and techniques used to assist individuals in determining and understanding their own work behavior and vocational potential. Selection and use of occupational exploration programs and work samples; 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) Return-to-work issues in disability management programs: early intervention, quality services, and cost containment; standards and procedures for rehabilitation counselors/case managers.

541 Psychosocial Aspects of Disability (3) Psycho-social impact of disability on family and societal structures, handicapped persons. Reactions to loss, coping with disability, and societal rehabilitation.

543 Medical Aspects of Disability (3) Etiology and clinical symptoms related to disease 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.

547 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 practice 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/NC or letter grade.

591 Clinical Studies (4) 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 school age and post-secondary age students/clients. Delivery of assistive technology in hardware programs and assistive devices, delivery systems, interdisciplinary evaluation/planning, and funding issues.

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

601 Seminar in Educational Theories in Special Education and Rehabilitation (3) Education theories: education and rehabilitation of exceptional persons. Theory applications in educational settings. Prereq: Admission to doctoral program or consent of instructor.

602 Seminar in Social Processes in Special Education and Rehabilitation (3) Social phenomena which influence impact of disability on person and on significant others. Implications for habilitation. Prereq: Admission to doctoral program or consent of instructor.

603 Seminar in Research in Special Education and Rehabilitation (3) Development and implementation of research. Independent research studies. Research proposals. Prereq: 9 hrs of research core and consent of instructor.

610 Internship in College Teaching and Supervision (3-9) Supervised practice in college teaching and supervision. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional engaged in theoretically-based research. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

630 Internship in Institutional Leadership in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitioner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

679 Special Topics (1-3) Prereq: Admission to doctoral program. May be repeated. Maximum 9 hrs. S/NC or letter grade.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

Ecology and Evolutionary Biology

(College of Arts and Sciences)

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., III (Emeritus), Ph.D. .......... Oklahoma State
Burghardt, G. M., Ph.D. .......... Chicago
DeCourt, H., Ph.D. .......... Minnesota
DeCourt, P. A., Ph.D. .......... Minnesota
Echternacht, A. C., Ph.D. .......... Kansas
Etienne, D. A., Ph.D. .......... Minnesota
Graduate Study in Ecology and Evolutionary Biology

Associate Professors:
- Drake, J. A., Ph.D. Purdue
- Gavrilets, S., Ph.D. Moscow State
- Drake, J. A., Ph.D. Purdue

Assistant Professors:
- Butler-Higa, M., Ph.D. Washington (St. Louis)
- Kover, P. X., Ph.D. Indiana
- Wetzin, J., Ph.D. Arizona
- Wolf, J. B., Ph.D. Kentucky

Research Professors:
- Cooper, L. W., Ph.D. Alaska
- Grebmeier, J. M., Ph.D. Alaska

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 the expectation 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 850. 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 3.0 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 Office of Graduate Admissions 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 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 Council, aspirants 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 research committee; (3) satisfactorily complete and defend a research thesis.

The Doctoral Programs

In addition to general requirements of the Graduate Council, 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; (3) pass a written and oral comprehensive examination designed to test for adequate knowledge in those areas essential to the student's research program; and (4) 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 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 an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

Graduate Courses

411-12 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 departmental major.

419 Science as Method (3) Dynamic process of scientific discovery. Comparisons of science, nonscience, pseudoscience, successful and unsuccessful science. Ethics of scientific research, philosophical aspects of scientific enterprise, and implications for teaching and writing about science. Prereq: Liberal science or philosophy course, or consent of instructor. (Same as Botany 419 and Philosophy 419.)

431 Plant Ecology (4) (Same as Botany 431.)

446 Introduction to Oceanography (4) Basic oceanography: physical, chemical, geological and biological processes and patterns. Oceanic ecosystems: upwellings, polar seas, 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 experimental research in ethology. Coreq: 450. (Same as Psychology 459.)


461 Special Topics in Organismal Biology (3) Evolution, ecology, biogeography, classification, and anatomy of selected animal and plant taxa. Prereq: General Ecology or consent of instructor.

470 Aquatic Ecology (3) Introduction to the physiochemical nature of inland waters with description of biotic communities and their interrelationships. Prereq: Chemistry 120-130 General Chemistry, Biology 250 General Ecology. 2 hrs and 1 lab.


484 Conservation Biology (3) Application of principles and techniques of ecological research to conservation of biological diversity at genetic, population, community, and ecosystem levels. Prereq: Biology 240 General Genetics, 250 General Ecology.

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

502 Registration for Use of Facilities (1-15) 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 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 9 hrs. S/NC only.

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.
512 Foundations: Readings in Conservation Biology (2) Readings and discussion of classic papers in field.
514 Foundations: Readings in Mathematical and Computational Ecology (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 effects that human-caused changes have on living organisms. Lectures and field trips. Appropriate for students in Planning and Environmental Engineering. Not intended for graduate students in Ecology and Evolutionary Biology.
535 Ecology and Development in the Amazon (3) Natural history, ecosystem diversity and function, and approaches to sustainable ecosystem development in the Amazon Basin. Includes field trip of 7-10 days to Manaus, Brazil.
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. Prereq: Consent of instructor. 4 hrs combined 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. Prereq: 540 or consent of instructor. 4 hrs combined lecture and lab.
542 Insect Structure and Function (3) Integrated study of morphology and physiology at tissue and cellular levels in insects. Prereq: Consent of instructor.
543 Aquatic Insects (3) Taxonomy and biology of aquatic insects; immature forms. Prereq: Consent of instructor. 2 hrs and 1 lab.
544 Fresh Water Invertebrate Zoology (3) Ecology and taxonomy of fresh water invertebrates exclusive of insects. Prereq: Comparative Invertebrate Biology or equivalent and consent of instructor. 3 hrs lab and field study.
545 Advanced Animal Behavior (3) Second-level course on behavioral change, stressing evolution, genetics, physiology, and social behavior. Prereq: 450 or equivalent. (Same as Psychology 545.)
546 Ethological Psychology (3) (Same as Psychology 546.)
547 Conceptual Foundations of Evolution and Behavior (3) (Same as Psychology 547.)
552 Development Planning in the Third World (3) (Same as Planning 552.)
555 Environmental Planning (3) (Same as Planning 555.)
556 Ice-Age Environments and Global Climate Change (3) Exploration of Ice-Age climatic cycles and dynamic responses of landscapes within glacial, periglacial, and non-glacial environments across North America over past 2.5 million years. (Same as Geology 556.)
557 Quaternary Ecology (3) Perturbation, process, and pattern within Quaternary ecosystems; climatic change and vegetational response during last 2.5 million years. Prereq: Consent of instructor. (Same as Geology 557.)
560 Biometry (3) Statistical applications in biological research. Prereq: Statistics course or consent of instructor.
561 Environmental Toxicology (3) Basic concepts in toxicology; molecular toxicology and detoxication; reproductive toxicology; mutagenesis, teratogenesis, carcinogenesis, pathologic changes and environmental impact. Prereq: Biochemistry and Cellular and Molecular Biology 410, Organic Chemistry or consent of instructor. (Same as Biochemistry and Cellular and Molecular Biology 561.) F
575 Ecological Genetics (3) Genetics of natural populations, using both single-locus and quantitative genetic approaches. Prereq: Genetics course or equivalent.
577 Landscape Ecology (3) Ecological structure, function, and change through time of landscape mosaics; quantitative measures of landscape heterogeneity; responses of organisms to changes in landscape heterogeneity. Prereq: General Ecology or equivalent or consent of instructor.
581-582 Mathematical Ecology (3,3) (Same as Mathematics 581-582.)
583 Zoogeography (3) Processes determining geographic distribution of animals and composition of animal communities. Prereq: Ecology course or consent of instructor.
585 Mathematical Evolutionary Theory (3) (Same as Mathematics 585.)
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.
599 Advanced Evolutionary Ecology (3) (Same as Botany 599.)
600 Doctoral Research and Dissertation (3-15) P/ NP only. E
602 Advanced Topics in Ecological Process and Structure (1-3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in ecological process and structure. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.
603 Advanced Topics in Evolutionary Biology (1- 3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in evolutionary biology. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.
604 Advanced Topics in Conservation Biology (1-3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in conservation biology. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.
607 Seminar in Ecology and Evolutionary Biology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs.
609 Advanced Topics in Comparative Animal Behavior (1-3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in animal behavior. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.
610 Advanced Topics in Mathematical, Theoretical and Computational Ecology (1-3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in theoretical and computational ecology. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.
611 Advanced Topics in Organismal Biology (1-3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in organismal biology. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.
612 Advanced Topics in Environmental Toxicology (1-3) Exposure and in-depth training in contemporary topics and approaches important to advanced research in environmental toxicology. Consult departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs. (Same as Biochemistry and Cellular and Molecular Biology 612.)
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. The role of risk and impact assessment in achieving sustainable development. Prereq: General ecology or equivalent. (Same as Botany 635 and Planning 635.)
681-682 Advanced Mathematical Ecology (3,3) (Same as Mathematics 681-682.)

Economics (College of Business Administration)

MAJORS

DEGREES

Economics ........................................... M.A., Ph.D.
Matthew N. Murray, Head

Professors:
Bohm, Robert A., Ph.D. ....................... Washington (St. Louis)

Associate Professor:
Gauger, Jean A., Ph.D. ............... Iowa State

Assistant Professors:
Barkoulas, John, Ph.D. ............ Boston College Bruce, Donald, Ph.D. ................. Syracuse Fallaschetti, Dino, Ph.D. .............. Washington (St. Louis) Mohnis, Mohammed, Ph.D. ............... Yerk Munkin, Murat, Ph.D. ................ Indiana Santore, Rudy (Liaison), Ph.D. ........ Ohio State 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.

ACADEMIC STANDARDS

A graduate student 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 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.

STUDENT’S RIGHT TO PETITION
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 non-thesis 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. 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 600 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 513-14 Macroeconomic Theory (3,3).
   c. Quantitative Methods: Completion of 581, 582 and 583 with grades of B or better, or by qualifying examination.
   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.

2. Students are required to demonstrate competence by 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.

3. Students are required to complete with a grade of B or better two elective courses in economics at the 500 level or above, outside the core subject areas and outside the fields of specialization.

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; Forest, 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 application of interested students. Applicants should have a background in both natural and social sciences evidenced by prior coursework or experience. One course in environmental studies from the student’s 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 above, a policy-relevant dissertation approved by the coordinating 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 Ph.D. program in Economics is available to residents of the state of Kentucky. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

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 explanations of cycles, role of monetary and fiscal policies in aggregate economy. Major writing requirement. Prereq: Intermediate Macroeconomics or consent of instructor.


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 and impacts of growth on environment. Major writing requirement. Prereq: 201.

471 Public Finance: Optimal Government Functions and Expenditure Analysis (3) Problems of collective consumption, external effects, public investment, social decision making. Major writing requirement. Prereq: 201.

472 Public Finance: Taxation and Intergovernmental Relations (3) Analysis of individual taxes and of tax systems, non-tax sources of revenue, fiscal federalism. Major writing requirement. Prereq: 201.

482 Introduction to Mathematical Economics (3) Application of basic mathematical tools: calculus, matrix algebra, etc. to economic theory. Prereq: Intermediate Microeconomics with B or better, and Calculus.

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

502 Registration for Use of Facilities (1-15) 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/NC only. E

511-12 Microeconomic Theory (3.3) Theory of consumer choice and demand, theory of revealed preferences, attributes of goods and implicit prices, market demand, labor supply, individual behavior under uncertainty, theory of firm, theory of production and cost, market structures, 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, price and employment; Results using Keynesian, non-market-clearing, monetarist, and rational expectations paradigms.

515 History of Economics (3) Purpose and methods of history of economics. Background for and origins, classical, neoclassical, and modern schools, development and conclusions of classical political economy; From Adam Smith through J.S. Mill and K. Marx. Anticipators of neoclassicism: J. Dupuit and H.H. Gossen.

525 Economic History of Europe (3) Nature and functions of economic systems and policies in the 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 aspects of antitrust and public utility; International and environmental regulation on business. Development of decision-making skills in area of governmental-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.


581 Mathematical Methods in Economics (3) Mathematical analysis in economics emphasizing applications of selected mathematical techniques to economic topics; theory of choice, firm, consumer behavior, general equilibrium, games, distribution, growth, stability, and input-output. Prereq: 311 and calculus.

653 Econometric Techniques (3) Multivariate time series, panel data and limited dependent variable analysis applied to economic problems. Prereq: 582.

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

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 adjustment, multinational corporations, and international capital flows. Prereq: 512 and 514.

623 Economic Development: Theories and Policies (3) Pruning 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 important economic and political force in U.S., from Colonial times to present. Evolution of legal status of labor union and of individual workers vis-a-vis their employers.

651 Monetary Theory (3) Study of money, credit, and liquidity as related to real output determination, interest rates, employment, and prices. Prereq: 513.

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, centers, 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, product, and product accounts, shift and share analysis, economic base studies, 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: 582 or equivalent.

690 Workshop (3) Advanced topics in economics. Student participation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

Education

(College of Education)

MAJORS

DEGREES

College Student Personnel ................. M.S.
Counseling ......................................... M.S.
Education ............................ M.S., Ed.S., Ed.D., Ph.D.
Educational Administration and Policy Studies

Educational Psychology ........................ M.S.
Human Performance and Sport Studies .......................... M.S.

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. Theory and Practice in Teacher Education.

The College also offers initial teacher licensure programs at the graduate level. The program features a professional year internship with accompanying coursework which may lead to a master's degree with a major in Education. See Track 2 under Master's Programs, Education, and Teacher Licensure.

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 admissions, write to the Student Services Center in the College of Education, Claxton Complex A332, The University of Tennessee, Knoxville, TN, 37996-3400, tel. (865) 974-8194, www.utk.edu/departments/advising.

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 major 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 60 hours of coursework including 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 disciplinary 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
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 (36 hours for instructional technology concentration). The non-thesis option requires the completion of 33 hours of coursework (36 hours for special education and instructional technology 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:

Art education
Education of the deaf and hard of hearing
Elementary teaching
Modified and comprehensive special education
Secondary teaching
Special education: early childhood
FIELDS OF INSTRUCTION
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 Studies offers a concentration in educational administration and supervision, requiring a minimum of 36 hours, including 6 hours of Thesis 500 for the thesis option, or 36 hours for the non-thesis option.

The concentration in educational administration and supervision consists of a minimum of 18 hours of coursework in Educational Administration and Supervision. A final oral examination is required for the thesis option, with a written exam at the option of the committee. A final written comprehensive examination is required for the non-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 (sport management concentration requires 33 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
- Special 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 educational administration and supervision concentration requires the completion of a minimum of 30 hours beyond the master’s degree. 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 Graduate Studies for complete program requirements.

THE DOCTOR OF EDUCATION 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, science education)

In addition to the requirements of the Graduate Council, 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 90 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.

The requirements for the concentration in educational administration and policy studies are determined on an individual basis by each student’s doctoral committee. Course requirements include a 6-9 hour cognate within the college and a 6-9 hour minimum external to the college. Additional course requirements include completion of two consecutive semesters of Educational Administration and Policy Studies 604 during residence. Though an internship is highly recommended, it is not required. A foreign language requirement is at the discretion of the committee. A written comprehensive examination, as well as an oral examination on the dissertation, is required. An alternative residency, which includes a two-year, on-campus, continuous enrollment in Educational Administration and Policy Studies 606, Leadership Forum, is available for qualified students.

THE DOCTOR OF PHILOSOPHY PROGRAM

Faculty from all six departments participate in the delivery of the Ph.D. degree program with a major in Education. Concentrations and specializations are available in the following areas:

- Counseling psychology (gender and cultural issues in counseling, career development, group process, counseling service, assessment)
- Counselor education (school counseling, counseling service) (Not currently accepting new students)
- Cultural studies in education (social and cultural theory)
- Curriculum, educational research, and evaluation (curriculum, educational research, evaluation, educational applications of technology)
- Early childhood education (early childhood special education)
- Educational administration and policy studies (educational administration and supervision, higher education)
- Educational psychology (adult education, applied educational psychology)
- Exercise science (biomechanics/sports medicine, exercise physiology, physical activity and population health)
- Instructional technology (educational applications of technology)
- Literacy, language education, and ESL education (literacy, ESL education)
- Teacher education (elementary education, gifted and talented education, mathemathics education, science education, social science education)

The program requirements are:
Degree program are available through the College of Education Student Services Center, Claxton Complex A332, (865) 974-8194, or ldmorgan@utk.edu.

CERTIFICATE IN URBAN EDUCATION

The Department of Theory and Practice in Teacher Education offers a certificate program in urban education for experienced urban teachers. A cohort group is competitively selected each year.

Participants complete a 12-credit, four-course program of study over a two-year period. First-year courses are Theory and Practice in Teacher Education 595 Special Topics (Trends and Issues in Urban Education) and Education 540 Topics in Improvement of Instruction (Improving Teaching and Learning in Urban Schools). Second-year courses are Theory and Practice in Teacher Education 595 Special Topics (Accommodating Diverse Student Needs in Urban Classrooms) and 550 Action Research and Practical Inquiry in Education.

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 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. Counseling is available to residents of the state of Florida (concentration in rehabilitation counseling) or Kentucky (concentration in mental health counseling). The M.S. program in Education (concentration in education of the deaf and hard of hearing) is available to residents of the states of Alabama, Maryland, South Carolina, Virginia, or West Virginia. The M.S. program in Human Performance and Sport Studies is available to residents of Alabama, Arkansas, Maryland, South Carolina, Virginia, 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 Administrative Services Assistant in the Office of Graduate Admissions.

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 other persons in treatment of exceptional individuals. May be repeated. Maximum 6 hrs. S/NC only.

540 Topics in Improvement of Instruction (1-3) Special conferences, workshops, and inservice programs. May be repeated. Maximum 6 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; overview of research. F, Su

568 Teacher-Parent-Community Relations (3) Techniques for effective relations between parents and teachers; examination of roles and expectations; parental involvement; volunteer programs; influence of community on educational process. Prereq: Consent of instructor. Sp, Su

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. Prereq: Admission to Teacher Education program. May be repeated. Maximum 12 hrs. S/NC only. F, Sp

576 Practicum in Classroom Teaching (1-8) Teaching and teaching-related experiences in elementary and secondary school settings. Specific hours and school level assignment determined by licensure or certification requirements. May not be used for probationary licensure year. May not be used toward degree requirements. May be repeated. Maximum 12 hrs. S/NC only.

589 Field Experience (1-3) Application of curricular and instructional principles, methods, and materials in schools. Prereq: Program prerequisites and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

591 Clinical Studies (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.

601 Trans-College Seminar (1) Introduction to Ph.D. program in Education: research requirements, meaning of scholarship in academe and issues/problems in education. Minimum of two consecutive semesters preceded or followed by summer term required of all Ph.D. students. Prereq: Admission to Ph.D. program or consent of Ph.D. program coordinator. May be repeated. Maximum 3 hrs. May not be used to meet 600 requirement. S/NC only.

635 Teacher Education in America (3) For students preparing to enter teacher education. Brief historical development, program analysis and evaluation, current issues, and future directions. F

Educational Administration and Cultural Studies

(College of Education)

MAJORS

DEGREES

College Student Personnel ......................... M.S. Education .................. M.S., Ed.S., Ed.D., Ph.D.

Educational Administration and Policy Studies ........................................ M.S. Human Performance and Sport Studies ... M.S.

Joy T. DeSensi, Head

Professors:

The Department of Educational Administration and Cultural Studies participates in graduate programs leading to degrees, majors, and concentrations in:

**Master of Science**

**College Student Personnel**

**Education**

- Social foundations
- Educational administration and policy studies
- Educational administration and supervision

**Human Performance and Sport Studies**

- Sport studies
- Specialist in Education

**Education**

- Educational administration and supervision
- Doctor of Education
- Educational administration and policy studies
- Doctor of Philosophy

**Education**

- Cultural studies in education
- Educational administration and policy studies
- Social-cultural foundations of sport and education

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, semiotics, literary theory, hermeneutics, linguistics, and feminist theory.

The faculty are devoted to interdisciplinary inquiry and seek to bring their disciplines to the service of students and faculty throughout the college as aids to understanding diverse 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 of schools and colleges, community and human service agencies, adult and continuing education organizations, and educational units of government and corporate organizations.

A cohort based, qualitative 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 should contact the department for further information.

The annual admission deadline is March 15 for the Ed.D. 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) Culminating experience for non-thesis major. Research study suitable for publication, or practicum requiring special written work. Prereq: 552.

502 Registration for Use of Facilities (1-15) 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

503 Problems in Lieu of Thesis (2-3) May be repeated. Maximum 9 hrs. S/N/C only. E

505 History of Olympies: 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-political issues. F

515 Social Theories of Sport (3) Liberal, democratic and Marxist social theories of sport. Sp

526 Philosophy of Education (3) Description, interpretation, and critique of philosophical/theoretical arguments: truths, knowledge and values in relation to education.

532 Professional Practice Issues in Sport Psychology (3) Study and critique of various aspects of professional practice in sport psychology.

533 Psychology of Sport (3) Social psychological factors influencing human behavior in sport context: discussion of contemporary theory, research, and methodology. Prereq: General psychology course or consent of instructor.

534 Motor Behavior and Skill Acquisition (3) Topical examination and application of principles of human movement behavior to acquisition and performance of skills; discussion of current research and methodology.

535 Health and Exercise Psychology (3) Study and cultural critique of various aspects of exercise psychology.

537 Sport Psychology Seminar (1) Issues and problems in applied sport psychology. Analysis and synthesis of research literature and discussion of sport psychology consultation practices and other topics. May be repeated. Maximum 3 hrs. S/N/C only.

539 Development of Education Thought (3) Historic and philosophical approach to lives and writings of influential educators: Plato, Quintilian, Comenius, Rousseau, Pestalozzi, Froebel, Dewey. Prereq: Graduate status and consent of instructor. Sp,Su

540 Foundations of Educational Policy (3) Relationship between policy, theory, 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 enterprise. F,Su

541 Special Topics (1-3) Advanced study in selected disciplinary or professional areas of physical education and/or sport. May be repeated.

542 Sociological Aspects of Sport (3) Social and cultural factors influencing sport and physical education. Pertinent issues and research applications. Prereq: Consent of instructor. F,Su

544 Survey of Contemporary Philosophies in Education (3) Current debates within various philosophical fields of study related to education.

545 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

546 Topics in History of Education (3) May be repeated. E

547 Topics in Philosophy of Education (3) May be repeated. F,Sp

548 Transforming Critical Thinking: Constructive Thinking and Educational Implications (3) Critique and transformation of critical thinking to more holistic, relational, and aesthetic model of multicultural and gender-sensitive constructive thinking; confronting power and addressing educational implications.

549 Topics in International Education (3) Historical, philosophical, and sociological foundations; selected nations and their cultures. May be repeated. E

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, historiography, biography, and life history. Critical reading and evaluation of qualitative research studies. F,Su

561 Qualitative Research in Education Settings (3) Implementing and writing qualitative studies in educational settings. Qualitative data collection, analysis, and report writing. Prereq: 560 or equivalent. Sp

590 Cultural Studies Seminar (2) Two semester sequence (Fall and Spring); ongoing discussion about cultural studies: popular cultural, interdisciplinary work, social justice issues. Presentations, videos and readings. May be repeated. Maximum 4 hrs. S/N/C only. F,Sp

591 Issues in Cultural Studies (3) Combination of theoretical readings in cultural studies and service learning for social justice project. Discussion of interdisciplinary, social justice and activism. Links between theory and practice of cultural studies.

592 Justice, Schools, and Sports (3) Social justice issues: education and sport practices. Social justice, moral commitments to others in educational and sport settings, and equal opportunities for social goods and benefits. Prereq: Admission to doctoral program with concentration in cultural studies in education. Sp

593 Independent Study (1-3) May be repeated. S/N or letter grade. E

594 Supervised Readings (1-3) May be repeated. S/N or letter grade. E

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Mertz, Norma T., Ed.D. ...................... Columbia
Morgan, W. J. (Liaison), Ph.D. .............. Minnesota
Paul, Joan (Emeritus), Ed.D. ................ Alabama
Phillips, Madge M. (Emeritus), Ph.D. ...... Iowa
Ubben, Gerald C., Ph.D. ..................... Minnesota
Wisniewski, Richard (Emeritus), Ed.D. .... Wayne State
Wirsberg, C. A., Ph.D. ...................... Michigan

Associate Professors:

Anfara, Vincent, Ph.D. ............... New Orleans
Aper, Jeffery P., Ph.D. .................... VPI
Norris, Cynthia, Ed.D. ................... Tennessee
Thayer-Bacarbas, Ph.D. ................. Indiana
Wright, Handel K., Ph.D. .............. Toronto

Assistant Professors:

Fisher, Leslee, Ph.D. ................... California
Margione, Terry, Ph.D. .................... Buffalo
Moyer, Diana, Ph.D. ....................... Ohio State

Moyer, Diane, Ph.D. ........................ Ohio State
592 Seminar in Philosophy of Education (3) Selected philosophical issues in education. Prereq: 2 courses in history or philosophy of education. May be repeated with consent of instructor. Sp

609 Feminist Epistemologies and Education (3) Theoretical research currently presented by feminist philosophers questioning traditional (male) epistemologies; application of these feminist epistemological theories to current feminist work in education.

625 Seminar in History of Education (3) Selected historical issues in education. Prereq: 2 courses in history or philosophy of education. May be repeated with consent of instructor. Sp

633 Advanced Sport Psychology (3) Analysis, synthesis, and discussion of contemporary theory and topics; research development and production in sport psychology. May be repeated. Maximum 9 hrs.

548 Topics in Sociology of Education (3) May be repeated.

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.


681 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

694 Supervised Reading (1-3) May be repeated. S/NC or letter grade. E

695 Special Topics (1-3) Study for doctoral students in selected aspects of cultural studies. May be repeated. Maximum 9 hrs. S/NC or letter grade.

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

604 Seminar in Educational Administration and Policy Studies (1-4) Directed readings and discussion of current issues, policy, and research in educational administration. May be repeated. Maximum 6 hrs. S/NC only.

606 Leadership Forum (2) Development of research, evaluation, policy analysis skills and critical analysis and evaluation of philosophical principles underlying American education. Continuous enrollment for 2 years, on-campus, for students in Ed.D. alternative residence program. May be repeated. Maximum 12 hrs. S/NC only.

512 Modes of Inquiry (3) Various inquiry approaches to research in education; related philosophical, methodological and ethical considerations in research design and in use of research findings. (Same as Educational Psychology 612.)

517 Case Study Methods in Educational Research (3) Methods, techniques and strategies consistent with case study approaches to inquiry in educational and related settings. Required background: Prior knowledge and understanding of research design and modes of inquiry in the social sciences.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

695 Internship in Higher Education (1-6) Supervised practicum in selected areas of higher education administration. Prereq: Consent of instructor. May be repeated. S/NC only. E

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 interpersonal communication skills and channels, intergroup relations, supportive work climates, personnel motivation, conflict skills, motivation, role 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 back-grounds to read and understand technical professional literature. Introduction to inferential statistics, needs assessments, and evaluation procedures. Sp, Su.

523 Administration of Special Services (3) Legal, programmatic, and ethical responsibilities of educational administrators in design and implementation of special service programs within school settings. Special emphasis on planning, 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 education. May be repeated. S/NC only. E

531 Social and Psychological Aspects of Physical Education (3) Individual and group social and psychological development principles, theories, and practices in the field of physical education. Prereq: M.S. introductory core or consent of instructor. F, Su.

535 Administrative Applications of Micro Computers (3) DOS, word processing, data management, spread sheets, and computer communications. Overview and development of specific administrative applications: scheduling, attendance, student record systems, and accounting. F, Su.

544 School Finance and Business Management (3) For prospective building level administrators. Financial and logical management tasks and procedures in individual school setting. Prereq: M.S. introductory core or consent of instructor. F, Su.

548 Supervision and Personnel Administration (3) Basic supervisor and personnel concepts and related competencies, building (or micro-organizational) level; interpersonal, group, and departmental supervision with emphasis on generating employee, supervision of instructional and non-instructional personnel, clinical supervision, staff evaluation, and staff development. Prereq: 454, 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. Special analysis, PERT, Delphi. Prereq: M.S. introductory core or consent of instructor. F, Su.

554 Policy Issues in Educational Law, K-12 (3) Legal arrangement 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 appropriate educational setting working directly with administrator. At end of planned program of study. Placement by department assignment. Some on-campus classes in conjunction with 583 or 582. Prereq: 21 hrs in educational administration and supervision or consent of instructor. 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 internship at end of planned course of study. Prereq: 21 hours in educational administration and supervision or consent of instructor. F.

590 Special Topics (1-3) May be repeated. E

592 Field Problems in Educational Administration and Supervision (3) Topic to be assigned. May be repeated. S/NC or letter grade. E


605 Advanced Seminar in Administrative Theory (3) Interdisciplinary seminar. Readings selected by faculty for research and scholarly value from early to current classic theoretical studies and current periodi-cal and periodical literature in administrative and organizational theory. Required of Ph.D. students in education. Prereq: Doctoral student in education.

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 experimental research methods, parametric and non-parametric statistical techniques used in research, study, and experimental research design. Prereq: 516 or consent of instructor. F, Sp.

616 Research Methods (3) Overview of descriptive and experimental research designs: data collection, analysis, and interpretation for survey studies and school surveys. Conduct of survey. Prereq: Basic statistics and computer skills or consent of instructor.

629 Seminar in Policy Issues in Education (3) Local, state, and federal education policy: theory analysis, development and implementation. Why education policy is changing rapidly, ways to follow and influence educational policy, and legal frameworks to use for future understanding. Prereq: 529, 616 or equiva-lent 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, employee wage and salary administration, fringe benefits, collective negotiations, human relations, staff development, and staff evaluation. Prereq: 548 or consent of instructor. F, Su

655 Legal Issues in Education (3) School law; constitutional foundations as they relate to public education at state and local levels. F, Su

658 Conflict Management (3) Social conflict and its management. Causes of interpersonal, intergroup, and organizational conflict, skills and strategies used to manage conflict, conflict management models associated with different sectors of human activity, and current organizational practices for managing destructive conflict. F

670 Values and Ethics in Educational Leadership (3) Examination of moral and ethical dimensions of work of educational administrators; assistance to current and prospective administrators to deal with dimensions in knowledgeable, reflective and principled ways. (Same as Higher Education 670.)

680 Administration of Complex Organizations (3) Concepts and theoretical formulations to understand, analyze, evaluate, and change complex educational programs and organizations. Prereq: 513 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 535.)

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 policy 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, policy and practices, 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, dress, organizations, activities fees, tuition, and related federal regulations.

543 American Higher Education in Transition (3) History, philosophy, purposes, functions, organizations and programs in American higher education.

570 Student Affairs Administration in Higher Education: Theory & Practice (3) Historical, philosophical and organizational perspective. Functional areas comprising field and major issues.

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.

574 The College Student (3) Today's college student beginning with transition into college, through critical first year and beyond, culminating in senior year and another period of transition.

599 Internship in College Student Personnel (1-6) Prereq: Consent of instructor. May be repeated. S/NC only.

619 Administration and Governance of Higher Education (3) Trends, structure and process of collegiate governance. Development of understanding of administrative theory and practice in higher education. Prereq: 543 or consent of instructor. F

630 Special Topics (1-3) May be repeated. E

640 Policy Issues in College and University Law (3) Legal precedent affecting organizations, administration, and finance of higher education. Academic free- dom, faculty termination, religion, tort liability, administrative law, academic due process and affirmative action in employment. Sp

645 Curriculum & Instruction in Higher Education (3) Content and organization of institutional strategies and curricular structure in higher education. F, Su

650 Fiscal Policy Issues in Higher Education (3) Revenue sources, appropriation process, budget procedures, cost analysis, and fiscal management in public and independent colleges and universities. Sp

652 Values and Ethics in Educational Leadership (3) (Same as Educational Administration and Supervision 670.)

690 Seminar in Higher Education (3) Capstone experience for doctoral students. Examination of major philosophical concepts and policy principles distinctive to American higher education, review of significant and current policy reports and critiques, exploration of contemporary policy issues, and evaluation of recommended reforms in higher education. Travel to state, regional, and national policy agencies for higher education.

**Educational Psychology**

(College of Education)

**MAJORS**

**DEGREES**

Education ......................... Ed.S., Ed.D., Ph.D.

Educational Psychology .............. M.S., Ph.D.

R. S. McCallum, Head

Professors:

Bellon, Jerry J. (Emeritus), Ed.D. UC Berkeley

Brockett, Ralph G., Ph.D. ............. Syracuse

Dickinson, Donald J. (Emeritus).

Ed.D. .................................. Oklahoma State

George, Thomas W., Ed.D. .......... Tennessee

Greenberg, Katherine H., Ph.D. ......... Georgia

McCullum, R. S., Ph.D. ............... NC State

Skinner, Christopher H., Ph.D. ....... Lehigh

Williams, R. L. (Liaison), Ph.D. ......... George Peabody

Associate Professors:

Bain, Sherry K., Ph.D. .... Southern Mississipi

Kindall, Luther M., Ed.D. .......... Tennessee

Ziegler, Mary F., Ed.D. ................. Columbia

The Department of Educational Psychology offers graduate programs leading to degrees, majors, and concentrations in:

**Master of Science**

**Educational Psychology**

Adult education

Individual and collaborative learning

Educational Specialist

Education

School psychology

Doctor of Education

Doctor of Educational psychology

**Doctor of Philosophy**

**Education**

Educational psychology

School psychology

See Education under Fields of Instruction for full description of all degree requirements. The department brings together four areas of graduate study related to teaching and learning across the lifespan. The department is committed to the creation and study of environments that enhance learning potential and promote lifelong learning for people of all ages, abilities, and backgrounds who enter our programs and the professional practices that we address. Assistantships and fellowships are available for qualified applicants. For more detailed information about the department, see website at http://web.utk.edu/~edpsy.

The adult education area is designed for individuals who seek to provide professional leadership in the education of adults. It offers two degree programs: Master of Science with a major in Educational Psychology, concentration in individual and collaborative learning, and Doctor of Philosophy with a major in Educational Psychology, concentration in educational psychology, specialization in adult education. For details, see website at http://web.utk.edu/~appedpsy.

The collaborative learning area is designed for professional practitioners who seek to increase their understanding of the collaborative learning process and its facilitation in their interaction with learners of any age in a variety of educational situations. It offers the Doctor of Education degree program with a major in Education, concentration in educational psychology, specialization in collaborative learning. For details, see website at http://web.utk.edu/~collab.

The school psychology area offers advanced training in psychological, educational, and professional foundations leading to licensure as a school psychologist. It offers two degree programs: Educational Specialist with a major in Education, concentration in school psychology, and Doctor of Philosophy with a major in Education, concentration in school psychology. For details, see website at http://web.utk.edu/~schopsy.

**Admission Requirements**

Admission requirements include completion of all items in the department's admissions packet and three letters of recommendation (i.e., rating forms). Up-to-date GRE scores are required for application to all degree programs except the master's
432 The Disadvantaged Student: Psychoeducational Perspectives (3) Theory and research regarding etiology, psychosocial behavior and appropriate interventions. F

460 Self-Management in the Helping Professions (3) Applications of self-management strategies to career, social, emotional, and health domains for both helping professionals and their clientele. Prereq: Introductory course in psychology or consent of instructor. S/N or letter grade. F, Su

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

502 Registration for Use of Facilities (1-15) 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 as degree requirements. May be repeated. S/N only. E


504 Special Topics (1-3) Instructor-initiated course offered at convenience of unit on topics of current interest. May be repeated. Maximum 15 hrs. S/N or letter grade. E

505 Quasi-Experimental and Single-Subject Design Research (3) History, theory and research design techniques used to examine cause and effect relationships during applied psychoeducational research. Focus on controlling threats to internal validity through research design. Su

509 Internship in Adult Education (3) Practical field experiences 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 Applied to Education (3) Theory and research on emotional, social, and intellectual development over life span with applications to educational and therapeutic settings. 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 ethological learning as systems apply to student motivation, discipline and learning. Su

516 Educational Applications of Cognitive Learning Theories (3) Cognitive theory and research, social learning theory, attribution and information processing as applied to education. Su

517 Direct Assessment and Interventions for Aca- demic Skills Deficits (3) Theory, techniques and procedures shown to prevent and remedy academic skills deficits; procedures for classroom-based assessment and direct intervention procedures. Su

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Survey of Adult Education (3) Historical development, 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

521 Program Development and Operation in Adult Education (3) Theories and methods from research to practice in planning, implementing and evaluating adult education programs. Prereq: Consent of instructor. Sp

522 Adult Development (3) Theory and research in adult development and change over lifespan and its implications for adult learning in formal and informal contexts. F

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. Sp

524 Continuing Professional Education (3) Theories, concepts, research and management of educational programs for adults in professions, Prereq: 520 or equivalent. F

525 Characteristics of Adult Learners (3) Key characteristics of adult learners, current theory and research on adult learning, and implications for teaching and learning concepts. Sp

526 Informal Methods of Assessment (3) Development and use of rating scales, check-lists, observation, test scores and case reports in assessment and counseling of children and adults. Prereq: Counselor Education and Counseling Psychology 525. A

527 Controversies in Adult Education (3) 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 of aging and gerontology related issues: psychological and related physiological changes that occur in later life stages of human development. Implications for treatment programs and policies. Prereq: and consent of instructor. Sp

529 Facilitating Adult Learning (3) Theory, research, and practice related to working with adults in teaching-learning situations. 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 professional specialty. Consideration of history and current issues in school psychology. F

541 Psychoeducational Assessment (3) Direct, psychological, and behavioral 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/N only. F, Sp

545 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 complete world view and supervised school psychology internship sites. Prereq: Enrollment in school psychology program and consent of instructor. May be repeated. Maximum 12 hrs. S/N only. E

560 Discipline and Conflict Resolution (3) Theories of major modes of discipline and conflict reso- lution strategies in development of constructive atmosphere 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 Under- achieving 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. Learning to learn, 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 all types of educational settings in relation to systems theory and collaborative learning. F, Su


593 Independent Study (1-3) May be repeated. S/N 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/N 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/N or letter grade. E

609 Advanced Seminar in Curriculum and Learning (3) Team-taught interdisciplinary seminars on theories, 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.) F

620 Seminar in Adult Education (3) Issues in adult education, theories and concepts, philosophical positions, research trends and methodologies. Prereq: 520 or equivalent. Sp

621 Advanced Seminar in Program Planning (3) Concepts, principles, and processes 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. A

630 Doctoral Seminar in Collaborative Learning (3) Issues, theories, concepts and research in collaborative learning, Prereq: Admission to Ed.D. in Educational, concentration in educational psychology; collaborative learning. May be repeated. Maximum 12 hrs. S/N or letter grade. F, Sp

635 Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Counselor Education and Counseling Psychology 635.) F

640 Seminar in Applied Educational Psychology (2) Issues, theories, concepts and research in applied educational psychology. Prereq: Admission to Ph.D. in Education. May be repeated. Maximum 12 hrs. S/N only. F

649 Advanced Internship in School Psychology (1-9) Supervised experience as school psychologist in unit-approved internship site for doctoral level students. Prereq: Enrollment in doctoral level school psychology program and consent of instructor. May be repeated. Maximum 9 hrs. S/N 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 services. May be repeated. Maximum 9 hrs. S/N only. F, Sp
655 Research in Psychoeducational Studies (1) Data analyses, collection, and interpretation. May be repeated. Maximum 9 hrs. S/N/C only. F,Sp

663 Scale Construction (3) Development, pilot testing, and revision of attitude inventories, rating scales, and other paper-and-pencil techniques for assessing beliefs, personality characteristics, and opinion. Prerequisite: Counselor Education and Counseling Psychology 525, and two-course sequence in statistical analysis. A

665 Analysis of Research in Instructional Technology (3) Research on human learning, design of learning environments. Analysis of teacher behavior, text development, computer software design and video presentations. A

666 Practicum in Instructional Planning (3) Development and management of course or program of instruction in educational psychology. Prerequisite: 665, or consent of instructor. E

669 Internship in Educational Psychology (1-6) Supervised employment in unit approved educational psychology internship sites. May be repeated. Maximum 12 hrs. S/N/C only. E

671 Mediated Learning Theory (3) Feuerstein’s theory of mediated learning experience and connections to work of Piaget, Vygotsky and others. Implications for training of teaching and building of learning communities for learners of all ages. Prerequisite: 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 theory related to furthering of collaborative learning in professional practice settings. Engagement of class members in collaborative learning. Prerequisites: 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 in State Department of Education’s Student Evaluation Manual and Diagnostic and Statistical Manual of Mental Disorders of American Psychiatric Association. Su

693 Independent Study (1-3) May be repeated. S/N/C or letter grade. E

The Department of Electrical and Computer Engineering offers graduate degrees leading to the Master of Science and a Doctor of Philosophy with a major 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, electro-optics, image processing, information processing, intelligent control, microelectronics, mixed-signal VLSI, monopolistic sensors, power electronics and systems, sensor fusion, and signal processing. The department sustains a strong joint program in mixed-signal VLSI and monopolistic sensors with the Oak Ridge National Laboratory, Instrumentation and Controls Division. This program provides students with unique opportunities to receive career-related training at ORNL while satisfying thesis or dissertation requirements of the graduate program. Departmental graduate programs are also available at the Space Institute, Tullahoma. Further information about these various programs is available from the department.

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 all these students to complete a minimum of 30 semester hours of graduate credit. This undergraduate coursework may include electives for students who are interested in related areas of electrical engineering.

Master’s Degree Requirements

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 all these students to complete a minimum of 30 semester hours of graduate credit. This undergraduate coursework may include electives for students who are interested in related areas of electrical engineering.

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 8 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 courses, 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, computer systems, control theory, communication systems, electromagnetic theory, plasma engineering, power systems, solid-state electronics, power electronics, and control systems.

Applicants are required to submit scores on the 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 levels.
   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 degree.
4. Satisfactory performance on a qualifying examination and on a comprehensive examination. The qualifying examination is prepared by the Electrical Engineering faculty and consists of two 4-hour written examinations covering the 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 18 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 Council. 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 four 4-hour course 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 written sections. The student 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 presentation of a proposal for dissertation work and its defense. The committee may cover additional topics in the oral part.
5. Participation in departmental seminars.

GRADUATE COURSES

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 used 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, accumulated background knowledge, and the use of computer-aided tools to design and develop projects. Directed to topics within field of electrical engineering. Level 3 design projects which require laboratory work. Prereq: 316 Signals and Systems II, 325 Electric Circuits, 335 Computer Science II, 532 Electronic Circuits, 342 Communications, 355 Computing System Fundamentals.

Prereq: 316 Signals and Systems II.

416 Computer Control Systems (4) Computer control systems with state variables and z-transform model representations with sampling theory and its effect on digital control design. Design of digital controllers in both state space and frequency domain. Level 2 design projects.
Prereq: 316 Signals and Systems II.

421 Electric Energy Systems (3) Structure and operation of electrical energy grid; load flow, dynamic stability, fault ride-through, and power system stability. Level 1 design projects.

422 Power System Operations and Planning (4) Dynamic phenomena in power systems. Transient stability, security assessment, and planning; direct and indirect methods for stability determination in nonlinear systems. Level 2 design projects.

423 Electric Machines (3) Principles of electromechanical energy conversion. Design procedures for AC and DC machine windings; construction and performance characteristics. Design of machine parameters or steady state and dynamic performances; the d-q model; reference frames. Level 1 design projects. Prereq: 316 Signals and Systems II, 325 Electric Energy System Components.

431 Operational Amplifier Circuits (3) Linear and non-linear active circuits using commercial operational amplifiers. Operational, instrumentation, isolation, bridge, rms and logarithmic multipliers and function generators, rectifiers, references, active filters, modulation and demodulation, sinusoidal generator, and harmonic fundamental calculations in op-amp circuits. Design for specified pole-zero functions. Applications: transistor interfacing. Level 1 design projects which require laboratory work. Prereq: 316 Signals and Systems II, 332 Electronic Circuits, 342 Communications.

432 Electronic Amplifiers (4) Feedback amplifier principles; wideband linear amplifier design; low-noise preamplifier design; audio power amplifier design; linear regulated power supply design and switching regulator principles. Radio frequency amplifier design; oscillator principles. Laboratory experiments and design projects. Level 2 design projects which require laboratory work. Prereq: 431.

441 Digital Communication (3) Quantization and pulse code modulation. Binary and M-ary signaling, spectra of line codes, link budget analysis, binary communication in presence of noise. Level 1 design projects. Prereq: 342 Communications.


443 Antennas and Propagation (3) Antennas and propagation project: antenna theory; fundamental antenna concepts and parameters (directivity, gain, patterns, etc.) and signal propagation. Theory and design of linear and loop antennas, arrays, and other simple antennas. Level 2 design projects. Prereq: 316 Signals and Systems II, 331 Fields, 342 Communications.

446 Electromagnetic Compatibility (3) Principles and practices to avoid interference among and within electronic devices. Design for shielding and grounding of dipole, monopole, dipoles, and log-periodic antennas. High frequency effects in circuit elements. Radiated and conducted emissions and susceptibility. Crosstalk, shielding, electrostatic discharge, and EMC regulations. Laboratory and design projects. Prereq: 316 Signals and Systems II, 331 Fields, 342 Communications.


452 Design of Digital Systems and Computers (4) Considerations for design and application of digital systems and computers: embedded systems concepts and design, computers and microprocessors, microcontroller instruction sets, microprocessor architecture, system design, embedded systems, embedded devices, embedded systems design, and embedded system design. Prereq: 316 Signals and Systems II, 331 Fields, 342 Communications.


471 Introduction to Pattern Recognition (3) Statistical decision theory, adaptive classifiers, and supervised and unsupervised learning. Application of techniques in areas of current interest: face recognition, speech processing, remote sensing, data mining and bioinformatics. Level 1 design projects. Prereq: 316
Design of controllers, for multivariable systems, which consider observability, realization theory, and stability theory. Level 2 design projects. Prereq: 316 Signals and Systems II, non-majors require consent of instructor.

481 Power Electronics (3) Principles and characteristics of power electronic devices, single-phase and polyphase power control circuits, converter control, ac voltage controller. Level 1 design projects or consent of instructor. Prereq: 316 Signals and Systems II, 325 Electric Energy System Components, 332 Electronic Circuits.

482 Power Electronics Circuits (4) Voltage-fed inverters, PWM principles, control of inverters, dc-dc converters, dc machine drives, resonance converters, step motor drives, brushless dc machine principles. Level 2 design projects which require laboratory work. Prereq: 481.

491 Special Topics (3) Basic design and current practice. May not be repeated to satisfy senior requirements for graduation. Prereq: Completion of all junior Electrical and Computer Engineering courses or consent of instructor. Prereq: Consent of instructor. May require laboratory work.

495 Senior Seminar (1) Current topics. Prereq: Completion of all junior Electrical and Computer Engineering courses or consent of instructor. S/NC or letter grade.

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

501 Project in Lieu of Thesis (3) Capstone course taken under direction of student’s major professor and master’s committee. Individual project involving literature survey, development of some software or hardware, testing, writing a white paper or journal paper, or other suitable project. Prereq: Consent of graduate committee. May be repeated. Maximum 6 hrs.

502 Registration for Use of Facilities (1-15) 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 or letter only. E

503 Modern Transform Methods (3) Frequency domain transform methods: relevant fundamentals of complex variable theory. Two-sided Laplace transform, its inversion with residues, and its relation to the Fourier transform and series. Sampling theory. Two-sided z-transform, its properties, and transmission in discrete Fourier transform and fast Fourier transform.

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, sampling, fast Fourier transform (FFT) and fast convolution, design of FIR filters and 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, Materials Science and Engineering 507, and Mechanical Engineering 507.)

511 Linear Systems Theory (3) State space models of linear dynamical systems, linear algebra, state transition map, matrix exponential, controllability, 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.


519 Control Systems Design II (3) Digital control. Variable structure control, state-space design of SISO systems, use of estimators and observers, comparison of classical and state-space methods of control system design, considerations for control system instrumentation. Prereq: 518.

521 Power Systems Analysis I (3) Matrix-vector representations of power networks, sequence modeling of general power networks, unbalanced fault 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 inverters, PWM inverters, thyristor converters, current-fed inverters, drive system modeling, vector and scalar control of induction machines, parameter variations, control principles of synchronous machines.


531 Advanced Analog Electronics I (3) Physical operation of modern electronic devices; semiconductor devices; J-FETs, MOS-FETs. Small-signal equivalent circuits and noise models of active devices. Project laboratory. Prereq: 431, 432, or consent of instructor.


541 Electromagnetic Fields (3) Maxwell’s equations, scattering and transmission by cylinders, spheres and transmission in planar media, guided waves, radiation from current elements. Prereq: Mathematics 404.


545 Introductory Microwave Networks and Components (3) Scattering and transfer representation for multiports; unilateral and bilateral microwave and millimeter wave devices. Component and system parameter measurement by modern network analyzers. Electronic oscillators and amplifiers, frequency synthesis, microwave digital time devices, parametric devices, 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 in fusion research. Laboratory safety, data reduction and presentation, microprocessor based data handling and analysis, and reduction of time series data. Prereq: 461, 463, 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 electron, 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.


573 3D Methods in Robot Sensing, Vision and Visualization (3) Tools used in image synthesis and analysis; 3D recovery by nonlinear estimation. Project geometry, analytic photogrammetry, range sampling, lighting models, differential geometry, and 3D rendering.

574 Advanced Computer Vision (3) Principles and methods for analysis of time and/or space varying imagery. Imaging physics and color theory, shape-form-X, feature correspondence and tracking, stereo Vision, structure from motion, optical flow, motion-based segmentation, and selected topics form current literature. Prereq: 573 or consent of instructor.


588 Graduate Seminar (1) Topics of interest discussed. 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/ NP only. E

614 Optimal Control (3) Deterministic and stochastic dynamic programming in continuous and discrete time, numerical solution principles and implementation, computational methods in optimal control. Prereq: 611.

617 Special Topics in Systems Theory I (3) Topics of current interest to students and faculty; large scale systems, model order reduction, algebraic and geometric system theories, and advanced design methods. Prereq: 503 and consent of instructor.

618 Special Topics in Systems Theory II (3) Topics of current interest to students and faculty; large scale systems, model order reduction, algebraic and geometric system theories, and advanced design methods. Prereq: 503 and consent of instructor.
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 Scherbius drives, VSCF generation, 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 distributed parameter effects. Case studies drawn from active research, power systems, 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, electro-mechanical and quantum-mechanical devices. Prereq: 531-32 and consent of instructor.


643 Detection and Estimation Theory (3) Detection theory; coding theory; system identification. Signals 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, error-correcting 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 architecture 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 fully 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-hydrodynamics 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.

664 Advanced Plasma Physics II (3) Plasma heating and radiation phenomena. Advanced topics of current interest. Must be taken in sequence. Prereq: 663.

671 Image Processing and Robotics I (3) Three-dimensional scene modeling and recognition, multi-sensor systems. Prereq: 572 or 573 or consent of instructor.

672 Image Processing and Robotics II (3) Stereo-vision, shape theory. Prereq: 671.

673 Image Processing and Robotics III (3) Time-varying imagery, path planning and navigation. Prereq: 672.

691 Advanced Graduate Seminar (1) Research in department. May be repeated. S/N/C or letter grade. May be repeated. Maximum 9 hrs.

692 Special Topics (1-3) Advanced topics of current interest to Ph.D. students in Electrical Engineering. May be repeated. Maximum 9 hrs.

699 Advanced Graduate Seminar (1) Research in department. May be repeated. S/N/C or letter grade.

Engineering Science

See Mechanical and Aerospace Engineering and Engineering Science.

English

(Majors in Arts and Sciences)

MAJOR

English.................................................M.A., Ph.D.

D. Allen Carroll, Head

Professors:

Adams, Percy G. (Emeritus), Ph.D. .......... Texas
Bratton, Edward W. (Emeritus), Ph.D. .... Illinois
Carroll, D. Allen (Douglas Bruce Prof.), Ph.D. ................. North Carolina
Cox, Don R., Ph.D. ................. Missouri
Dunn, Allen, Ph.D. ................. Washington
Ensor, Allison R., Ph.D. ........ Indiana
Finnegan, Richard J. (Hodges Chair of Excellence), Ph.D. ........ North Carolina
Fisher, John H. (Emeritus), Ph.D.

Pennsylvania

Gardner, Stanton B., Jr. (Lindsay Young Prof.), Ph.D. ................. Princeton
Gill, J. E. (Emeritus), Ph.D. ........ North Carolina
Goslee, David F., Ph.D. ................. Yale
Goslee, Nancy M. (Distinguished and Lindsay Young Prof.), Ph.D. ........ Cambridge
Heffernan, Thomas J. (Kenneth Curry Prof.), Ph.D. ................. Princeton
Kallet, Marilyn, Ph.D. ................. Rutgers
Keene, Michael, Ph.D. ................. Texas
Kelly, Richard M. (Lindsay Young Prof.), Ph.D.

Duke

Leggett, B. J. (Distinguished Prof.), Ph.D.

Florida

Leki, Ilona, Ph.D. ................. Illinois
Lofaro, Michael A., Ph.D. ............... Maryland
Maland, Charles J. (Lindsay Young Prof.), Ph.D.

Michigan

Penneer, A. Richard (Emeritus), Ph.D.

Colorado

Reese, Jack E. (Emeritus), Ph.D.

Kentucky

Sands, Norman J. (Emeritus), Ph.D.

Shakespeare Institute

Schneider, Daniel J. (Emeritus), Ph.D.

Northwestern

Sciera, Dorothy M. (Emerita), Ph.D. ........ North Carolina
Stewart, Bain T. (Emeritus), Ph.D.

Northwestern

Stillman, Pennsylvania

Trahren, Joseph B., Jr. (Alumni Distinguished Prof.), Ph.D. ................. Princeton
Wier, Allen (Distinguished Teaching Chair), M.F.A.

Bowling Green

Wheeler, Thomas V. (Emeritus), Ph.D.

North Carolina

White, Jon M. (Emeritus), M.A. ......... Cambridge
Wright, Nathalia (Emerita), Ph.D. ............... Yale
Zomchick, John, Ph.D. ................. Columbia

 Associate Professors:

Atwill, Janet, Ph.D. ................. Purdue
Bensel-Myers, Linda D., Ph.D.

Oregon

Dumas, Bethany K., Ph.D. ............... Arkansas
Hammontree, Patsy G., M.A. ......... Tennessee
Hirst, Russel, Ph.D. ................. Rensselaer
Howes, Laura L., Ph.D. ............. Columbia
Jennings, The, Ph.D. ............... North Carolina
Papke, Mary E. (Liaison), Ph.D.

McGill

Smith, Arthur, Ph.D.

Houston

Assistant Professors:

Anderson, Misty G., Ph.D. ............ Vanderbilt
Billone, Amy, Ph.D. ................. Princeton
Black, Joseph L., Ph.D. ................. Toronto
Haddox, Thomas, Ph.D. ............. Vanderbilt
Hirschfeld, Heather, Ph.D. ........ Duke
Knight, Michael, M.F.A. ............. Virginia
Reiff, Mary Jo, Ph.D. ............... Kansas

The Department of English offers the Master of Arts and the Doctor of Philosophy degrees with a major in English. Thesis and non-thesis options are available for the M.A. as well as a special concentration in writing. The Department also offers a creative writing dissertation option in the doctoral program.

Detailed information about the master’s and doctoral programs, and about individual graduate courses, may be obtained by writing the Director of Graduate Studies in English, 306 McClung Tower. A prospective student must contact the department to receive the proper information and forms with which to apply. For additional information, please visit the graduate website through the College of Arts and Sciences homepage at www.artsci.utk.edu.

The Department of English does not accept students in non-degree or provisional status. A student who wishes to enter the department must apply in degree-seeking status for his/her application to receive consideration for any graduate program in English.

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 590 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. All capstone experiences normally occur 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 questions is available in 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 plan to do freelance writing, specialize in teaching writing courses at the college level, or work as professional writers 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 proper level. Of the courses in writing, at least 3 hours must be taken 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 short 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 (only 3 hours of 593 Independent Study may be applied toward the M.A. and 3 after the M.A.); a 3-hour course in teaching composition; and 15 additional hours at any level approved for graduate credit (including a maximum of 12 hours at the 400 level if approved by the Director of Graduate Studies).

Up to 6 of these additional hours may be taken in some cognate field or fields such as history, philosophy, French. These courses must be drawn from those approved for graduate credit. Coursework must be in the English department. In this coursework, students must normally maintain a 3.5 GPA.

Dissertation: Twenty-four semester hours of dissertation. These represent the research for and writing of the dissertation. The research and dissertation will be directed by a faculty member of the department and approved by a doctoral committee of three or four other faculty members.

Language Requirement: A language requirement met in one of the following ways:

1. Two languages approved by the Director of Graduate Studies in English. The requirement for each language may be fulfilled by (a) completion of French 302 or German 332 with a grade of B or better; (b) completion at UT of any two courses on the 300 level or above in the foreign language or literature with at least a grade of B in each course; (c) passing of the regular Ph.D. 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) 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 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 between 1590 and 1613. Reading and discussion of selected plays from romantic 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 1613. 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 1590 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: drama,
novel, 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 Brownsings; 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, Aphra Behn, Frances Burney, Mary Wollstonecraft, Mary Shelley, George Eliot, Virginia Woolf, and Doris Lessing. May be repeated. Maximum 6 hrs. (Same as Women's Studies 422.)

431 Early American Literature (3) From earliest texts to 1830; exploration and discovery, Native American, colonial, revolutionary, and early national works.

432 American Romanticism and Transcendentalism (3) Prose and poetry of American Renaissance, from c. 1830 to end of the Civil War: Cooper, Poe, Hawthorne, Melville, Emerson, Thoreau, Stowe, Douglass, Whitman and Dickinson.

433 American Realism and Naturalism (3) Literature from the time of the Civil War to World War I: 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 sentimental 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 into twentieth century: 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 O’Hudayi Brooks, writing by Black women, international Black literature in English, and Black American autobiography. (Same as African and African-American Studies 443.)

451 Modern British and American Poetry (3) From Yeats and Frost to Auden, Stevens, and more recent poets.

452 Modern Drama, 1880-1945 (3) Survey of British, American, and international drama from the advent of modern drama to the end of World War II. (Same as Comparative Literature 452.)

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 such writers as Kafka and Camus through contemporary authors. (Same as Comparative Literature 454.)

455 Persuasive Writing (3) Writing and analyzing persuasive works 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 production 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: 363 or consent of instructor.

464 Advanced Fiction Writing (3) Further development of skills acquired in basic writing 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 department. Maximum 6 hrs.

471 Sociolinguistics (3) Study of language in relation to society. Empirical and theoretical concerns. Language and social communities: tribal, national, regional, and individual. Prereqs: 371 or Linguistics 200 or consent of instructor. (Same as Linguistics 471 and Sociology 471.)

472 American English (3) Phonetic, morphological, and syntactic characteristics of major social and regional varieties of American English: regional 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 (3) Major issues surrounding teaching ESL/EFL: political implications of teaching ESL/EFL: introduction to second language acquisition; learner variables in language learning; traditional and innovative approaches to ESL/EFL; basic features of American English grammar necessary for teaching ESL. Prereq: Second year of foreign language or consent of instructor. (Same as Linguistics 474.)

475 Teaching English as a Second or Foreign Language (3) Issues, principles, and techniques in teaching grammar, speaking, pronunciation, reading, and writing in ESL/EFL. Observations and teaching practice in ESL classes and development of ESL materials and tests. Prereq: 474. (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; socio-cultural factors; and implications for second/foreign language instruction. (Same as Linguistics 476.)

477 Pedagogical Grammar for ESL Teachers (3) Aspects of English syntax and morphology presenting difficulties for non-native learners of English. Basic and complex sentence structures; noun and article system; verb tense, aspect, modality, and complementation. (Same as Linguistics 477.)

479 Literary Criticism (3) Historical survey of major works of literary criticism.


481 Studies in Folklore (3) Topics vary. May be repeated with different topic. Maximum 6 hrs.

482 Major Authors (3) Content varies. Concentrated study of at least one of the most influential writers in British or American literary history: e.g., Donne, Pope, Austen, Tennyson, Whitman, Faulkner, Lawrence, Baldwin, or Morrison.

483 Special Topics in Literature (3) Topics vary. May be repeated. Maximum 6 hrs.

484 Special Topics in Writing (3) Original writing integrated with reading, usually taught by professional author. Topics vary. May be repeated. Maximum 6 hrs.

485 Special Topics in Language (3) May be repeated. Maximum 6 hrs with consent of department. (Same as Linguistics 485.)

486 Special Topics in Criticism (3) Content varies. Theoretical and practical approaches to British and American literature. May be repeated with consent of department. Maximum 6 hrs.

489 Special Topics in Film (3) Content varies. Particular directors, film genres, national cinema movements, or other topics. May be repeated with consent of department. Maximum 6 hrs. (Same as Cinema Studies 489.)

490 Language and Law (3) Language in Anglo-American legal process; focus on differences between spoken and written language; lexical and syntactic ambiguity; pragmatics; speech act analysis; and language rights of linguistic minorities. Prereq: Foundations of the English Language or The Structure of Modern English or consent of instructor. (Same as Legal Studies 490 and Linguistics 490.)

495 Introduction to Rhetoric and Composition (3) Historical, theoretical, and empirical modes of inquiry in rhetoric and composition. Applications for teaching of composition. Prereq: Advanced Expository Writing or consent of instructor.

496 Rhetoric of Legal Discourse (3) Application of theoretical and practical tools of rhetorical study to legal materials. Prereq: Legal Studies 490 or consent of instructor.

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

502 Registration for Use of Facilities (1-15) 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 Teaching Freshman Composition (3) Introduction to teaching Freshman English through study of various techniques and philosophies of composition. Required of all first-year teaching associates.

506 Introduction to Literary Research (3) Critical examination of aims of English studies, professional English teacher, theoretical, and practical methods of research: collecting of information, evaluation of material, and transmitting of results of scholarship.

507 Applied Criticism: The Rhetoric of Literary Forms (3) Study and application of ways in which major criticism has been analyzed and questioned. Readings in and prose fiction may be repeated. Maximum 6 hrs.

508 History of the English Language I (3) Phonological, morphological, and syntactic development of English language: Old and Middle English. F,A

509 History of the English Language II (3) Phonological, morphological, and syntactic development of the English language with concentration on developments after 1500, especially in American English. Sp,A

513-14 Readings in Medieval Literature (3.3) Reading and analysis of selected masterpieces of Old and Middle English literature and their Continental sources in Modern English. May be repeated. Maximum 9 hrs. each.

520-21 Readings and Analysis in Selected Areas of Sixteenth- and Seventeenth-Century Prose, Poetry, and Drama (3.3) Content varies: genre, theme, literary movement, or other coherent emphasis. May be repeated. Maximum 9 hrs. each.

530-31 Readings in English Literature of the Restoration and Eighteenth Century (3.3) Topics vary. Genres: poetry, prose, fiction, drama; or period: Restoration, early eighteenth century, later eighteenth century. May be repeated. Maximum 9 hrs. each.

540-41 Readings in English Literature of the Nineteenth Century I and II (3.3) Content varies: genre,
550-51 Readings in American Literature (3,3) Content varies: genre, theme, literary movement, or other coherent emphasis. May be repeated. Maximum 9 hrs.

552 Readings in Black American Literature (3) Content varies: genre, theme, literary movement, or other coherent emphasis. May be repeated. Maximum 9 hrs.

560-61 Readings in Twentieth-Century Literature (3,3) Content varies: genre, theme, literary movement, or other coherent emphasis. May be repeated. Maximum 9 hrs.

576 Introduction to Contemporary Criticism (3) Introductory survey of twentieth-century literary criticism from New Criticism to present.

580 Fiction Writing (3) Advanced fiction projects under supervision of instructor and time for independent study. Prereq: Extensive background in reading and writing fiction. May be repeated. Maximum 6 hrs.

581 Colloquium in Poetry Writing (3) Major poetic project or continuation of project begun in 463. Individual consultation with instructor and time for independent study. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

582 Special Topics in Writing (1-3) Topics vary. May be repeated. Maximum 6 hrs. Enrollment by consent of director of graduate study only.

583 Special Topics in Literature (3) Topics vary: genres, modes, and other literary subjects not in standard period divisions. May be repeated. Maximum 6 hrs.

584 Topics in Feminist Studies (3) Topics vary. May be repeated. Maximum 9 hrs.

585 Issues in Invention, Style, and Audience (3) Theoretical perspectives on contemporary research in rhetoric and composition.

586 History of Rhetoric I (3) Survey of rhetoric from Sophists to Ramus.

587 History of Rhetoric II (3) Survey of rhetoric from Bacon to present.

588 Readings in Applied Rhetoric (3) Content varies: Writing across curriculum, writing centers, technical communication, text linguistics. May be repeated. Maximum 6 hrs.

589 Special Topics in Language (3) Topics vary. May be repeated. Maximum 6 hrs.

590 Topics in Critical Theory (3) Topics vary. 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.

594 Film History, Form, and Analysis (3) Issues in film studies; history of narrative film; concept of film form; critical approaches to film study (genre, auteur, formalist, and others); and critical analysis of individual films.

600 Doctoral Research and Dissertation (3,3,3) May be repeated. Maximum 9 hrs. each.

610 Studies in Old English Language and Literature (3) Old English grammar with readings in prose and poetry. F,A

611 Studies in Beowulf (3) Translation and critical study of Beowulf. Prereq: English 610 or consent of instructor. Sp,A

620 Studies in Medieval English Literature (3) Seminar in literature and literary genres of Medieval English literature, read in Old and Middle English. Subject matter varies from year to year. May be repeated. Maximum 9 hrs.


640-41 Studies in Restoration and Eighteenth-Century Literature (3,3) Topics vary: Swift, satire, restoration literature, Johnson and Boswell, Addison and Steele, restoration drama, Dryden. May be repeated. Maximum 9 hrs. each.

650 Studies in English Romanticism (3) Seminar content varies: particular literary figure or figures, genres, theme, or other coherent focus. May be repeated. Maximum 9 hrs.

651-52 Studies in Victorian Literature (3,3) Seminar content varies: particular literary figure or figures, genres, theme, or other coherent focus. May be repeated. Maximum 9 hrs. each.

660-61-62 Studies in American Literature (3,3,3) Southern literature before 1830, frontier, regionalism, women's literature, Irving, Cooper, Poe, Emerson, Thoreau, Hawthorne, Melville, Whitman, Dickinson, James, and Twain. May be repeated. Maximum 9 hrs.

670-71-72 Studies in Twentieth-Century Literature (3,3,3) Seminar content varies: particular literary figure or figures, genres, theme, or other coherent focus. May be repeated. Maximum 9 hrs.

680 Topics in English Language (3) May be repeated with consent of director of graduate studies. Maximum 9 hrs.


686 Studies in Creative Writing (3) Content varies. Connection between theory and practice in writing. May be repeated. Maximum 9 hrs.


690 Special Topics (3) Content varies. History of ideas, humor, biography, autobiography, extra-literary disciplines. May be repeated. Maximum 9 hrs.

694 Studies in Film (3) Content varies. Advanced work in film history and analyses. May be repeated. Maximum 6 hrs.

Entomology and Plant Pathology

(Graduate Program in Entomology and Plant Pathology)

MAJOR DEGREE

Entomology and Plant Pathology ............... M.S.

Carl J. Jones, Head

Professors:

Bernard, Ernest C., Ph.D. ................. Georgia
Bost, Steven C., Ph.D. .................. NC State
Burgess, Edward E., Ph.D. ............ Tennessee
Gerhardt, Reid R. (Liaison), Ph.D. .... NC State
Grant, Jerome F., Ph.D. ................. Clemson
Hilty, James W. (Emeritus), Ph.D. .. Ohio State
Johnson, Leander F. (Emeritus), Ph.D. .......... University of Tennessee
Jones, Carl W., Ph.D. ................. Wyoming
Lambdin, Paris L., Ph.D. .............. VP
Newman, Melvin A., Ph.D. .......... Texas A & M

Patrick, Charles R., Ph.D. ............... Georgia
Pless, Charles D. (Emeritus), Ph.D. .... Clemson
Southards, Carroll J. (Emeritus), Ph.D. .......... NC State
Trigiano, R. (Bob) N., Ph.D. .......... NC State
Windham, Alan S., Ph.D. .......... NC State
Windham, Mark T., Ph.D. .......... NC State

Associate Professors:

Canaday, Craig H., Ph.D. ............... Ohio State
Gwinn, Kimberly D., Ph.D. ............ NC State
Hale, Frank M., Ph.D. ............... Ohio State
Lentz, Gary L., Ph.D. ................ Iowa State
Owens, Bonnie H., Ph.D. .......... NC State
Skinner, John A., Ph.D. .......... California (Davis)
Vail, Karen M., Ph.D. ............... Florida

The Department of Entomology and Plant Pathology offers a graduate program leading to the Master of Science with a concentration in entomology or plant pathology. Students in entomology may specialize in crop entomology, medical and veterinary entomology, insect biology, insect pest management, or biological control. Students in plant pathology may specialize in foliar and stem fungus diseases, soilborne pathogens, disease physiology, biocontrol, plant nematology, or virology. For specific information, contact the department head.

THE MASTER’S PROGRAM

Admission Requirements

For admission to the M.S. degree program, a student must meet all requirements of The University of Tennessee Graduate Council and must have completed (1) general botany or biology, 8 hours; (2) advanced biological sciences, 8 hours; (3) general inorganic chemistry, 6-8 hours; (4) organic chemistry, 3 hours. In addition, three completed rating forms and a written statement of career goals and interest in entomology or plant pathology are required.

Degree Requirements

The program requires a written thesis based on original research and the completion of a minimum of 24 hours of coursework for graduate credit, approved by the student’s advisory committee. Included in the course requirements are two acceptable seminar presentations for 1 hour each. An oral final exam must be passed to the satisfaction of the advisory committee after the thesis has been completed. A minor is not required but may be selected at the option of the student. The minor will include at least 6 hours and not more than 10 hours of graduate-level credit in the minor department. The student’s committee shall include a member of the faculty from the minor department to assist in designating courses required for the minor.

GRADUATE COURSES

410 Diseases and Insects of Ornamental Plants (3) Symptoms, identification and management of diseases and insect pests that affect plants in greenhouse, nursery, and landscape environments. Prereq: Plant Pathology or Economic Entomology or consent of instructor. Sp,A

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during

108 Entomology and Plant Pathology
Exercise Science and Sport Management

(College of Education)

MAJORS

DEGREES

Education ........................................ Ph.D.
Human Performance and Sport Studies .. M.S.

Edward T. Howley, Head

Professors:
Bassett, David R., Jr., Ph.D. .............. Wisconsin
Beitel, Patricia A. (Emeritus), Ed.D. ....... North Carolina (Greensboro)
Howley, Edward T., Ph.D. ............ Wisconsin
Kozar, Andrew J. (University Prof.), Ph.D. ...................... Michigan

Associate Professors:
Jones, Ralph E., Ph.D. .................. Toledo
Kelley, Denny R., Ph.D. ............. Georgia State
Thompson, Dixie L., Ph.D. ............. Virginia

Assistant Professors:
Hardin, Robin, Ph.D. .................... Tennessee
McCutchen, M. G., Ed.D. ............... North Carolina (Greensboro)
Stratta, Terese, Ph.D. ................. Southern Illinois
Zhang, Songning, Ph.D. ............... Oregon

The Department of Exercise Science and Sport Management offers graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Human Performance and Sport Studies

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.

The exercise science concentration promotes and integrates scientific research, education, and practical applications of exercise science to maintain and enhance health, fitness, performance, and quality of life. The department offers an undergraduate major in Exercise Science that will prepare students for careers in fitness and provide the science-based background needed for application to graduate programs in biomechanics, physical therapy, cardiac rehabilitation, public health, exercise physiology, athletic training, or public school teaching. Graduate students and faculty focus on research dealing with theoretical and applied aspects of exercise and sport.

The sport management concentration provides the opportunity for students to attain knowledge and develop the essential skills to be successful sport managers. In addition, the department coordinates and provides instruction in many physical activities designed to improve physical fitness and encourage future participation in lifetime sports.

Elective courses are offered in dance. These courses are appropriate for students interested in management of dance studios, teaching dance, or dance performance.

ADMISSION REQUIREMENTS

Applicants are required to complete the departmental application which will be sent to all persons upon their initial inquiry about the program. This is in addition to the Graduate Application for Admission. Applications from persons who have less than a 3.0 GPA will not be considered.

The following retention policy applies to all graduate students seeking a degree in the department:

1. Graduate students are required to maintain an overall 3.0 GPA.
2. Any student who falls below this standard will be advised in writing by the department head of the need to discuss the matter with his/her advisor.
3. If a student’s overall GPA remains below 3.0 for a second semester, the student will have his/her degree status revoked.

GRADUATE ASSISTANTSHIPS

A limited number of graduate assistantships are available for qualified women and men who are graduates of accredited colleges or universities. These assistantships are open to students in the master’s and doctoral programs. Students interested in these opportunities should file their applications before February. Letters should be addressed to Graduate Assistantships Coordinator, Exercise Science and Sport Management Department, The University of Tennessee, Knoxville, TN 37996-2700.

Dance

GRADUATE COURSES

415 Teaching Creative Dance for Children (2)
Theory, methods, materials and practical experience in presentation and integration of creative dance in grades K-6. Mini-teaching experience.

480 Dance Through the 19th Century (3) Dance of various societies and culture from pre-history through 19th century.

490 Dance in the 20th Century (3) History and philosophy of dance.

495 Dance Pedagogy (3) Principles and methods of teaching dance with practical application in mini-teaching experience. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

510 Ballet: Level IV (2) Instruction and practice in advanced classical ballet techniques. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

520 Jazz: Level IV (2) Instruction and practice in advanced jazz styles and techniques. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

530 Modern: Level IV (2) Instruction and practice in advanced modern dance techniques. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.
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 General Physiology. (Same as Biochemistry and Cellular and Molecular Biology 480.)

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

501 Special Project (3) Culumnating 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 (1-15) Required for the student not otherwise registered during any semester 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


508 Research in Exercise Science (3) Research for writing of thesis and institutional review board proposals; presentation of research through free communication and poster presentations; calculation and interpretation of statistics related to coursework; research designs used in research; and use of computer software.

509 Graduate Seminar in Public Health (1) (Same as Public Health 509, Nutrition 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 process: 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 experimental methodology and instrumentation: respiratory and metabolic measurements, blood chemistry, and gas analysis. Prereq: 480 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: 480 or 533.


569 Clinical Exercise Physiology (3) Cardiac structure and function; interpretation of 12-lead electrocardiograms, exercise considerations for cardiac and pulmonary patient. Prereq: 480 or 533, and 567. (Same as Public Health 569.)

570 Cardiac Rehabilitation Practice (1-3) Supervision and experience in hospital-based exercise programs for participants with cardiac and/or pulmonary disorders. Use of telemetry monitoring, leading safe exercise regimens counseling participants on safe exercise guidelines. Presenting educational class on topic applicable to participants. Prereq: 533 and 567, or consent of instructor. Coreq: 569. May be repeated. Maximum 6 hrs.

581 Biomechanics Instrumentation (1) Kinematic and kinetic activity measurement of human movements using computerized videography, force platforms, electromyography and other relevant instruments. May be repeated. Maximum 3 hrs. S/NC only.

585 Seminar in Gerontology (1) (Same as Human Ecology 585, Counselor Education and Counseling Psychology 585, Nursing 585, Public 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 (3-15) P/NP only. E

601 Research Seminar in Exercise Science (1) Research topics in different aspects of exercise science. May be repeated. S/NC only.

622 Directed Independent Research (3-6) 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 life expectancy. 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 components of fitness. Prereq: Elementary statistics, 480 or 533, and 567 or 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 Exercise Science (1-6) Participation in research with faculty member whose interests coincide with those of student. S/NC only.

681 Practicum (1-3) Internship experience in areas of major interest. May be repeated.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

Sport Management

GRADUATE COURSES

415 Development and Maintenance of Recreation, Tourism and Athletic Facilities (3) (Same as Recreation and Tourism Management 415.)

440 Sport Marketing (3) Application of fundamental marketing concepts to sport industry. Marketing research, promotions, fund raising, advertising, and assessment of marketing programs specific to sport. Historical development of sport marketing. Prereq: Marketing or consent of instructor.

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

501 Special Project (3) Culumnating experience for non-thesis major. Research study suitable for publication, or practicum requiring special written work. Prereq: 532.

502 Registration for Use of Facilities (1-15) 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 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. Su

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.

530 Sport and Media Issues (3) Gender and race issues within context of media and sport. Development of sport media and influence on sport. F,Sp

532 Research Techniques in Sport (3) Evaluate, compare, and contrast research techniques in sport with examination for and experiences in appropriate review, design, analysis procedures, and proposal development. F,Su

535 Ethics in Sport Administration (3) Development of analytical skills and knowledge desirable of middle and upper level managers in sport business/organizations. Social issues and ethics in sport administration. Sp

540 Sport Economics and Finance (3) Principles of economics and finance as applied to sport organizations. Market structures of sport finance and political economics that form those structures.

544 Theories of Leadership and Leader Behavior in Sport (3) Integration of various theoretical approaches to leadership styles in sport administration within cultural contexts, research, and field experiences. Sp

553 Case Studies in Sport Administration (3) Current issues and problems in sport administration at all levels of amateur and professional sport. May be repeated under different topic. Maximum 9 hrs.

554 Readings in Sport Administration (3) Survey of pertinent literature in refereed and applied journals and texts. Su

555 Evaluation Techniques for Sport Managers (3) Review and application of techniques of evaluation appropriate for sport programs, facilities, and personnel. Sp

570 Event Management (3) Review of current research related to theory and practice in event management and involvement in management capacity with one or more special events. Su

575 Seminar in Sport Management (1) Selected topics in sport management. May be repeated with consent of instructor. Maximum 3 hrs. S/NC only.

580 Special Topics (1-3) Advanced study in selected disciplinary or professional areas of physical education and/or sport. May be repeated.

590 Practicum (3) Practical experience in areas of major interest. May be repeated. Maximum 6 hrs. S/NC only.
Finance

(College of Business Administration)

MAJOR DEGREES

Business Administration .......... MBA, Ph.D.

James W. Wansley, Head

Professors:
Black, Harold A. (James F. Smith, Jr., Prof.), Ph.D. .................................................. Ohio State
Boehm, Thomas P. (AmSouth Scholar), Ph.D. .................................................. Washington (St. Louis)
DeGennaro, Ramon P., Ph.D. .......... Ohio State
Dotterweich, William W. (Emeritus), Ph.D. .................................................. Pennsylvania
Ehrhardt, Michael C. (Castagna Prof.), Ph.D. .................................................. Georgia Tech
Philippatos, George C. (Distinguished Prof.), Ph.D. .................................................. New York
Shives, Ronald E. (Voigt Prof.), Ph.D. .................................................. UCLA
Wachowicz, John M., Jr. (AmSouth Scholar), CPA, Ph.D. ............................................... Illinois
Wansley, James W. (Clayton Homes Chair of Excellence) (Liaison), CFA, Ph.D. .............................. South Carolina

Associate Professors:
Auxier, Al L., Ph.D. ....................... Iowa
Collins, M. Cary (Home Federal Fellow), Ph.D. .................................................. Georgia
Daves, Phillip R., Ph.D. ................. North Carolina
Murphy, 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 careers in corporate financial management, security analysis and investments, banking and financial institutions, and real estate.

Minimum course requirements are three courses: 511, 525, 532, 581, and 599 (Torch Fund only).

Ph.D. Concentration: Finance.

Minimum course requirements are finance seminars 641, 642, 651, 652.

GRADUATE COURSES

502 Registration for Use of Facilities (1-15) 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 Strategic Management for Creation of Financial Value (3) Strategic issues in corporate finance, investments, and capital markets; how firms can employ financial strategies to create value. Use of derivatives, risk management, real options, fixed income securities, venture capital, initial public offerings and financial structuring. Prereq: Business Administration 511, 512, and 513, or consent of instructor.

512 Problems in Financial Management (3) Readings and cases that apply finance theory to real investment, financing, and asset management problems. Prereq: 511 and Business Administration 511, 512, 513, and 514, or consent of instructor.

525 Investment Analysis and Portfolio Management (3) Investment process, portfolio applications. Asset allocation decision in global setting; organization and functioning of financial markets; equity and bond valuation; asset valuation models; equity and bond portfolio management; options, forwards and futures contracts; evaluation of portfolio performance; and review of alternative economics and emerging markets. Prereq: 511 and Business Administration 511, 512, 513, and 514, 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: 511 and Business Administration 511, 512, 513, and 514, or consent of instructor.

581 Real Estate Investment and Finance (3) Financial and market analysis used to make real estate investment decisions. Effects of variety of financing options on rate of return on income-producing properties. Effect of various financing options on consumer’s decisions to purchase. Relationship between primary and secondary mortgage markets and impact of those markets on cost and availability of funds for real estate lending. Effects of government intervention (taxation, subsidization, and regulation) in both real estate and mortgage markets. Prereq: 511 and Business Administration 511, 512, 513, and 514, or consent of instructor.

599 Special Topics in Finance (1-3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC or letter grade.

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

641 Seminar in Finance (1-3) Capital markets, utility theory, asset pricing, theory of the firm, capital structure, dividend policy. Prereq: Consent of instructor. S/NC or letter grade.

651 Seminar in Corporate Finance (1-3) Recent theoretical and empirical developments in microfinance literature. Topics vary. Prereq: 641 and consent of instructor. May be repeated. Maximum 6 hrs. S/NC or letter grade.


653 Seminar in Financial Institutions (1-3) Theoretical and empirical studies of financial institutions. Topics: modeling banking firm, efficiencies in banking, bank lending arrangements and asymmetric information, international competitiveness, and deposit insurance. Prereq: 511 and consent of instructor. May be repeated. Maximum 6 hrs. S/NC or letter grade.


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:
Brekke, Clark J., Ph.D. ................. Wisconsin
Collins, Jim L. (Emeritus), Ph.D. ...... Maryland
Davidson, P. Michael, Ph.D. .... Washington State
Draughon, F. Ann, Ph.D. ......... Georgia
Jaynes, Hugh O. (Emeritus), Ph.D. .... Illinois
Melton, Sharon L. (Emeritus), Ph.D. ....... Tennessee
Miles, James T. (Emeritus), Ph.D. .. Nevada
Morris, William C., Ph.D. ........... Iowa State
Overcast, Woodrow W. (Emeritus), Ph.D. ....... Iowa State
Penfield, Marjorie P., Ph.D. ............ Tennessee

Associate Professors:
Weiss, Jochen, Ph.D. ................. Massachusetts
Zivanovic, Svetlana, Ph.D. ............ Arkansas

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. Minor areas are available in cognate fields. For detailed information, contact the department head.

Admission requirements of the Graduate Council 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 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.

2. Students working on a problem must register for 6 hours of 503.

3. 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.

4. 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.

5. 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 500.

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.

7. 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**

410 Food Chemistry (4) Reactions of water, proteins, lipids, carbohydrates, minerals, enzymes, vitamins, and additives in foods. Prereq: Chemistry 110 Introduction to Organic and Biochemistry, Biochemistry and Cellular and Molecular Biology 310 Physiological Chemistry, 3 hr of numbered above 600.

420 Food Microbiology (2) Physical, chemical and environmental factors moderating growth and survival of foodborne microorganisms; pathogenic and spoilage microorganisms affecting quality of foods and their control. Prereq: Microbiology 210 General Microbiology. Coreq: 429. F

429 Food Microbiology Lab (3) Methods for examination, enumeration, cultivation and identification of foodborne microorganisms. Prereq: Microbiology 210 General Microbiology. Coreq: 420. F

430 Sensory Evaluation of Food (3) Principles and methods of sensory evaluation of foods. Prereq: Basic statistics. 2 hrs and 1 lab. F

460 Meat Science (3) Carcass characteristics of meat animals, muscle structure and composition, cut identification, curing, freezing and cooking. Prereq: Food Industry or consent of instructor. Sp

469 Meat Science Lab (1) Slaughter and processing methods for beef, pork, lamb and poultry. Coreq: 460. 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 Quality Assurance and Sanitation Practices (3) Design and evaluation of food processing operation to produce safe and acceptable quality food product. Prereq: Food Chemistry, Food Microbiology, Food Preservation or consent of instructor. Sp

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

501 Seminar (1) Individual reports and discussion on topics from current literature. May be repeated. Max 3 hrs. F,Sp

502 Registration for Use of Facilities (1-15) 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 (2-3) May be repeated. S/NC 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/NC only. 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. Identification of materials used to modify color of foods. Prereq: Food Chemistry or equivalent. 1 hr and 1 lab. F,A

512 Flavor of Foods (2) Chemical basis, measurements, and reactions involved in flavor changes in foods. Manufacutring and application of flavorings in foods. Prereq: Food Chemistry or equivalent. 1 hr and 1 lab. F,A

515 Food Carbohydrates, Proteins and Lipids (4) Advanced study of chemical and physical attributes of carbohydrate, protein, and lipid components of foods; effects of components on production of safe and consistent quality food products; and changes during processing and/or distribution of food products. Prereq: Food Chemistry or equivalent. 3 hrs and 1 lab. Sp

521 Advanced Food Microbiology (3) Extrinsic and intrinsic factors associated with foods and food processing that relate to growth, survival, inhibition, detection, and recovery of foodborne pathogens and spoilage organisms; traditional and current approaches to microbiological food safety and quality. Prereq: Food Microbiology and Lab or equivalent. Sp,A

540 Food Product Development (3) Art, science and technology of developing and marketing new food products. Prereq: Food Presentation. 2 hrs and 1 lab. Sp,A

545 Advanced Food Science (3) Physical and chemical changes that occur in conversion of muscle to meat; effect of postmortem treatments on meat quality, composition and palatability; packaging, preservation and quality control. Prereq: 460. 2 hrs and 1 lab. Sp,A

590 Special Topics in Food Technology and Science (1-3) Critical reviews of current research and production concerns of food industry. May be repeated. Maximum 9 hrs. F,Sp

593 Directed Studies (1-3) Research on non-thesis topics chosen by student and major professor. Supervised experience in food industry or governmental laboratories. May be repeated. Maximum 6 hrs. E

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

601 Seminar (1) Reports and directed discussion on research topics from current literature. May be repeated. Maximum 3 hrs. F,Sp

620 Food Toxicology (3) Basic and applied concepts in food toxicology; toxicological aspects of processed foods. Mode of action, prevention and control of food toxics in food supply. Prereq: Food Chemistry, 521, or consent of instructor. Sp,A

640 Advanced Food Processing (3) Role of processing treatments and formulation of food properties; texture, flavor and color characteristics. Prereq: Food Preservation, 510, 511, 512 or consent of instructor. Sp,A

**Forestry, Wildlife and Fisheries**

**(College of Agricultural Sciences and Natural Resources)**

**MAJORS**

**DEGREES**

Forestry ........................................ M.S.

Natural Resources ............................ Ph.D.

Wildlife and Fisheries Science ............ M.S.

George M. Hopper, Head

Professors:

Barrett, J. W. (Emeritus), Ph.D. .......... Syracuse

Buckner, E. R. (Emeritus, Distinguished Prof.), Ph.D. ........................................ NC State

Core, H. A. (Emeritus), Ph.D. .......... Syracuse

Dearden, B. L., Ph.D. ................. Colorado State

Dimmick, R. W. (Emeritus), Ph.D. ......... Wyoming

Hill, T. K., Ph.D. ............................... Auburn

Hopper, G. M. (Liaison), Ph.D. ......... Virginia Tech

Ostermeier, D. M., Ph.D. ............... NC State

Pelton, M. R., Ph.D. .......................... Auburn

Rials, Timothy G., Ph.D. ............... Virginia

Scharlabram, S. E., Ph.D. .................. Colorado State

Schneider, G. (Emeritus), Ph.D. ........ Michigan State

Sharp, J. B. (Emeritus), D.P.A .......... Harvard
Graduate study leading to the Master of Science with majors in Forestry and in Wildlife and Fisheries Science and the Doctor of Philosophy with a major in Natural Resources is offered by the Department of Forestry, Wildlife and Fisheries. 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 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 Office of Graduate Admissions.

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. This work must be approved by the student’s committee and no more than 10 hours of the minimum 30 can be below the 500 level. The committee may require additional coursework if the student’s progress or background indicates such need.
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 upon completion of no fewer than 28 hours of approved study.

THE DOCTORAL PROGRAM

The doctoral program with a major in Natural Resources emphasizes interdisciplinary research approaches toward the understanding and management of natural resources in a broad context. Areas of study include forest, wildlife, and fisheries biology; ecosystem function and structure; natural resource economics and policy; human dimensions of natural resource management; natural resource organization administration and management; wood sciences; and multidisciplinary natural resources management.

Admission Requirements

Applicants to the Ph.D. program normally should have completed a master's degree prior to beginning the doctoral program. Specific admission requirements include:

1. A minimum grade-point average of 3.0 on a 4.0 scale.
2. A minimum composite score from the general Graduate Record Examination (GRE) on the verbal, quantitative, and analytical sections of 1500, with a minimum of 1100 on the verbal and quantitative sections.
3. A statement of professional goals, natural resource management philosophy, and reasons for applying to the program.
4. Three letters of reference from individuals capable of evaluating the applicant’s potential for graduate work in interdisciplinary natural resource management.

Degree Requirements

A candidate for the doctoral degree must complete 72 semester hours of coursework beyond the bachelor’s degree. Forty-eight hours must be in graduate coursework approved by the student's doctoral committee. Up to 24 hours of master's-level coursework may be applied to the 48-hour requirement. A minimum of 6 hours must be taken in UT courses at the 600-level exclusive of dissertation hours. Specific requirements are:

1. Research Methods and Analysis (9 credits in at least two of the subject areas)
   Research/Experimental Design
   Statistics/Econometrics/Biometrics
   GIS/Remote Sensing
2. Core Subject areas (33 credits to be determined by Doctoral Committee)
3. Professional Development (6 credits)
   Teaching - All students will be expected to complete FWF 601 and assist in teaching a course during their tenure in the program.
   Problem Solving – FWF 610 will be required of all doctoral students that will include participation in an interdisciplinary team to address a significant national or regional natural resource issue.
   Professional Communications – all students will be required to complete FWF 612 as part of their program of study. Part of the seminar requirement will consist of assisting in the development and conduct of FWF 512.
4. FWF 600 Doctoral Research and Dissertation (24 credits)
   A doctoral committee consisting of at least four faculty members must be identified by the student and major professor. At least two of the committee members must be from the Department of Forestry, Wildlife and Fisheries and one member must be from an academic unit other than Forestry, Wildlife and Fisheries. Three of the committee members, including the major professor, must be approved by the Graduate Council to direct doctoral research. The committee should be formed during the first year of the student’s program.
   All students are required to successfully complete an oral and written examination on all coursework completed as part of the Ph.D. requirements. The exam is scheduled when the student has completed all or nearly all of the coursework. The Ph.D. committee will determine the content, nature, and schedule of the comprehensive exam and certify the results.
   During the first year, the student should develop a research prospectus that outlines the research problem to be addressed as part of his/her doctoral research. The prospectus is presented to the student’s committee and the committee will approve the research topic and approach.
   All students are required to complete, present, and defend a dissertation. The student should provide each member of the committee a copy of the dissertation at least two weeks prior to the scheduled defense. All students are required to present a seminar on their dissertation as part of the degree requirements. The seminar can be part of the dissertation defense or presented before the formal defense.

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. Sp

422 Forest and Wildland Resource Policy (3) Policy formulation; criteria for policy determination; forest and wildland law and regulation; theory of conflict 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, site design projects; management strategies, methods of visitor and recreation site management; case studies. Weekend field trips. Prereq: Wildland Recreation or consent of instructor. 2 hrs and 1 lab. Sp

433 Wood Adhesives and Glued Wood Products (2) Theory and practice of adhesive bonding of wood; wood substrate-adhesive interface for bonding; principles of adhesion; wood adhesive types, gluing of solid wood and composite wood manufacturing practices; laboratory manufacture and/or testing of adhesives, adhesive bond strengths, and product performance. Day field trips. Prereq: Wood Properties and Uses and Wood Identification, or consent of instructor. 2 hrs and 2 labs. F

434 Wood Processing and Machining (2) Primary log breakdown and secondary processing into major products. Fundamentals of machining technology for major types of cutting operations: sawing, boring, planing, veneering and laser machining; day field trips. Prereq: Wood Properties and Uses and Wood Identification, or consent of instructor. 1 hr and 2 labs. Sp

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

502 Registration for Use of Facilities (1-15) 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 Problem Analysis in Forest Resources (3) Problem identification, analysis 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 non-thesis option for M.S. in Forestry. E

512 Seminar (1-3) Required of all graduate students in residence in fall. May be repeated. Maximum 2 hrs. S/N/C only. F

515 Forest Conservation Workshop (1-3) Relation of forest biology, ecology and management strategies. Not available to students in forestry or wildlife and fisheries science. May be repeated. Maximum 3 hrs. Su,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. Prereq: Consent of instructor or equivalent or consent of instructor. Sp,A

525 Woodlot Management (3) Current technologies and management strategies concerning wise use of forest resources for private, non-industrial forest landowners. Emphasis on planning and implementation. Prereq: 6 hrs of biological sciences or consent of instructor. Not available to students in forestry or wildlife or fisheries science. 6.5 hrs and 1.5 lab weekly for 6 weeks. Sp, A

530 Advanced Forest Resource Management (3) Analysis of forest management problems in public and private organizations. Classical forest regulation; linear and goal programming, as applied to resource management problems; advanced forest investment analysis; decision making methods for primary forest management activities; and methodologies for incorporating non-timber values in forest management operations. Prereq: Senior standing, 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 novel tree germplasm; forest genetics; and tissue culture; use of biochemical variation; planning and conducting forest genetics research. Prereq: 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 recreation alternatives. Overnight field trips. Prereq: Senior level 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 direction and control, and strategic management. Development of policy as planning tool and as results from conflict resolution. Linkage between policy development and execution, and structure and management of organizations. Prereq: Forest administration and policy or consent of instructor. F,A

580 Advanced Silviculture (3) Silvicultural characteristics, silvicultural practices and systems applied to commonly grown 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, growth/yield. Prereq: Undergraduate silviculture course or consent of instructor. 2 hrs and 1 lab. Sp,A

585 Advanced Forest Biometry (3) Application of sampling techniques to forest inventory; fixed and variable plot sampling; list sampling; Poisson sampling; regression estimators; multistage and multi-phase sampling; yield predictors for even-aged and uneven-aged forests. Prereq: Land Measurement Techniques and Forest Resource Inventory or consent of instructor. F

590 Advanced Topics in Forestry (1-3) Recent advances and concepts; research techniques; analysis of current problems. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

593 Independent Study in Forestry (1-4) May be repeated. Maximum 6 hrs. E

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


610 Seminar in Natural Resources (2) Selected issues in natural resources and natural resource management at regional, national, or international level. Development of interdisciplinary approach to addressing problems; evaluating current state of knowledge; developing alternative actions to address problems, and identifying criteria for evaluation of alternatives. F

612 Seminar in Forestry, Wildlife and Fisheries (1) Current issues and developments in forestry, wildlife and fisheries. Required of all doctoral students in residence during fall. May be repeated. Maximum 3 hrs.

Wildlife and Fisheries Science

GRADUATE COURSES

440 Wildlife Techniques (3) Methods of wildlife damage control, forest, farmland, wetland habitat management, identification of wildlife field sign, wildlife capturing techniques and management plan preparation. Weekend field trips. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field. F

442 Fisheries Techniques (3) Active and passive sampling techniques for fish populations; mark-recapture, population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination; incremental growth analysis; stream assessment; equipment and instrumentation usage and maintenance; safety in sampling methods. Weekend field trip. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field. F

443 Fisheries Science (3) Quantification and management of freshwater fisheries: population estimation, age and growth, biological assessment, and stocking. Prereq: 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 wild mammal management. Prereq: Principles of Wildlife and Fisheries Manage-
ment or consent of instructor, 2 hrs and 1 lab. One weekend field trip required. Sp

445 Ecology and Management of Wild Birds (3) Biological and ecological characteristics of game birds, endangered birds, and bird pests. Current principles and practices of wild bird management. Prereq: Prin-
ciples 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 fish-
eries scientists and managers, and foresters to acquant students with diverse perspective of ethical behavior in practices of wildlife and fisheries manage-
ment. Lectures, panel discussions, and case studies. Team taught. Prereq: Senior standing. S/NC only. Sp

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

502 Registration for Use of Facilities (1-15) 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. F,A

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/NC only. F

515 Seminar in Avian Ecology and Management (1-
2) Readings and discussion based on current literature on contemporary topics in avian ecology and manage-
ment. Additional credit awarded for writing review paper on contemporary topic of interest to student. Prereq: Consent of instructor. F, A

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. Sp,A

525 Endangered Species Management and Conser-
vation of Biodiversity (2) Status, ecology and man-
agement of endangered wildlife and plant species. Historic aspects, policy implications and philosophical issues surrounding recovery efforts. Approaches to monitor and manage for biodiversity. Prereq: Graduate standing or consent of instructor. Sp,A

530 Wildlife Diseases (2) Necropsy of birds and mammals. Techniques used in various diseases and tech-
ods of preparing pathological materials in field and lab. Investigative procedures concerning wildlife diseases. Prereq: 1 yr biology, 444 or 445, or consent of instructor. Same as Comparative and Experimental Medicine - Veterinary Medicine 530, F,A

535 Floodplain Ecosystems (3) Ecology, restoration and management of floodplain ecosystems: biotic and abiotic processes, social considerations, and wildlife and forest management; Lower Mississippi River Alluvial Valley. Prereq: Consent of instructor. F, A

540 Predator Ecology (2) Dynamics of terrestrial vertebrate predator populations in human-altered and relatively undisturbed environments. Prereq: 444 or 445, or consent of instructor. Sp,A

545 Advanced Population Analysis (2) Detail charac-
teristics, assumptions, goals, methods, and current technoloies for fish and wildlife population analysis. Use of computers. Prereq: Animal Science 571 or Statistics 538 or consent of instructor. Sp, A

546 Advanced Habitat Analysis (2) Habitat analysis as tool to evaluate habitat use and predict occurrences of animal and plant species: principles and goals of modeling, habitat analysis theory, GIS and statistical techniques. Use of computer programs. Prereq: For-
estry, Wildlife and Fisheries 410 or Geography 411 or consent of instructor. Sp, A

550 Fish Physiology (3) Mechanisms of gas transfer, circulation, excretion, osmoregulation, locomotion and neural/hormonal control of these systems in fishes. Comparisons and contrasts with physiology of terrestrial animals. Practical applications of fish physi-
ology to hatcheries, pollution assessment, and fish-
eries management. Prereq: Senior or graduate standing in life sciences.

555 Fish Culture (3) Principles, concepts and tech-
tiques of culturing economically important fish and shellfish species. Prereq: 443 or consent of instructor. 2 hrs and 1 lab. Sp,A

556 Recirculating Aquaculture (3) Growing fish in intensive, indoor systems. Techniques of solids removal, nitrification, and gas balance. Practical experience with operating system. Prereq: 443 or consent of instructor. Sp,A

560 Advanced Topics in Wildlife and Fisheries Science (1-3) Recent advances and concepts, research techniques and analysis of current problems. Prereq: 443, 444, 445, or consent of instructor. May be repeated. Maximum 6 hrs.

593 Independent Study in Wildlife and Fisheries Science (1-4) May be repeated. Maximum 6 hrs. E

FRENCH

French

See Modern Foreign Languages and Literatures

Geography

(College of Arts and Sciences)

MAJOR

DEGREES

Geography ................................. M.S., Ph.D.

Emory University

Bruce Ralston, Head

Professors:

Aiken, Charles S., Ph.D. ............... Georgia
Bell, Thomas L., Ph.D. ................. Iowa
Fresta, Ronald, Ph.D. ................... Rutgers
Hammond, E. H. (Emeritus), Ph.D. ... California
Harden, Carol P., Ph.D. ............... Colorado
Horn, Sally P., Ph.D. .................... California
Jumper, Sidney R. (Liaison), Ph.D. ... Tennessee
Long, Robert G. (Emeritus) ............ Virginia
Minkel, C. W., Ph.D. ................... Syracuse
Pulsipher, Lydia, Ph.D. ............... Southern Illinois
Ralston, Bruce, Ph.D. .................. Northwestern
Rehder, John B., Ph.D. ............... Louisiana State
Schmude, Theodore H. (Emeritus), Ph.D. ............... Wisconsin

Associate Professors:

Orvis, Kenneth H., Ph.D. .......... California
Shaw, Shih-Lung, Ph.D. ............ Ohio State

Assistant Professor:

Grisson-Mayer, Henri, Ph.D. .......... Arizona

The department offers the Master of Science and Doctor of Philosophy degrees. The master's degree emphasizes development of professional competence as a geographer and offers opportunities to gain substantial depth in a concentration or a major technique. An emphasis in geographic information science is available for students who have appropriate backgrounds in mathematics and computer science. The doctoral program is for those who have demonstrated proficiency in conducting independent research. The department is particularly well-qualified to direct graduate work in location analysis, transportation geography, urban and rural geography, cultural ecology, and the geography of the natural environment (especially biogeography and geomorphology). The faculty is qualified to direct students from a variety of approaches ranging from historical and humanistic to rigorously analytic and GIS-based.

THE MASTER'S PROGRAM

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 sound undergraduate major program. The M.S. program requires students to have background in quantitative methods equiva-

tent to the course content of Geography 415, and some familiarity with key themes and approaches in both physical and human geography. At least two-thirds of the total hours in the degree program must be at or above the 500 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 DOCTORAL PROGRAM

The doctorate is a research degree and is granted only to those who demonstrate proficiency in conducting independent research. Students must have a broad foundation and understanding of the discipline; these should have been acquired in a comprehensive master's program. Course requirements for the degree shall be determined by the student's faculty commit-
tee in accordance with specific interests and needs. The program must include 504, 515, 599, 9 hours of 600-level seminars, and (at each offering during residency) 501. A minimum of 9 semester hours must be earned in collaborative fields, with courses selected for their relevance to the special fields. Ph.D. students whose Master's level work was in a field other than geography and for whom the Master's area remains close to their Ph.D. specialty areas may petition to substitute geography units in courses outside of their specialty areas for up to 3 of the 9 required outside units. Competency in quantitative methods and basic human and physical geography is required. Additional tools, including languages, will be required as appropriate to the student's areas of research specialization.

Examinations required for admission to candidacy include a written comprehensive examination, composition of two written examinations in which the student will be tested on his/her knowledge of two special fields, and related areas of geography; an oral examination on the student's program, the special fields and related areas, and the dissertation proposal. All parts of the written comprehensive examination should be taken within the same semester.

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 in-state tuition basis. The Ph.D. program in Geography is available to residents of the states of Alabama, Arkansas, Mississippi, Virginia, or West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE COURSES

410 Global Positioning Systems and Geographic Data (3) Theory, field and laboratory use of Global Positioning Systems for capturing digital geographic data; management of geographic data; coordinate systems, datum issues, scanning and digitizing, map standards, and uncertainty in Geographic Information Systems. 2 hrs and 1 2-hr lab.

411 Computer Mapping and Geographic Information Systems (3) Computer programs, management, and presentation of digital data for spatial analysis: cartographic data structures. Prereq: 310 Introduction to Cartography or consent of instructor. (Same as Information Management 431.) 2 hrs and 1 2-hr lab.

412 Advanced Cartography Techniques (3) Cartographic design and display techniques for reference and thematic maps. Basic principles and methods of map reproduction. Prereq: Introduction to Cartography or consent of instructor. 2 hrs and 2 labs.

413 Remote Sensing: Types and Applications (3) Principles and uses of remote sensing imagery, digital data, and spectral data; geographic interpretation and mapping techniques. Prereq: Introduction to Cartography or consent of instructor.

415 Quantitative Methods in Geography (3) Geographical analysis of regional phenomena and processes involving both quantitative techniques and statistical methods. Prereq: 310 Introduction to Cartography 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.

423 Geography of American Popular Culture (3) Geographical study of regional variation in popular cultures, youth cultures in United States. (Same as American Studies 423.)

433 The Land-Surface System (3) Characteristics of surface form, weathering, 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 system leading to world pattern of climates. Climate 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 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 geographical 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. The Ph.D. program in Geography is available to residents of the states of Alabama, Arkansas, Mississippi, Virginia, or West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

441 Urban Geography of the United States (3) Concepts and theories concerning development and significance of systems of cities and internal morphol-

dy of cities in the United States. Writing emphasis course. (Same as Urban Studies 441.)

443 Rural Geography of the United States (3) Geographical appraisal of rural areas of the United States, including small towns and urban fringes. Problematical and potential of rural America. Writing emphasis course.

449 Geography of Transportation (3) Examination of transportation systems, their effects on trade patterns, land use, location problems, and development.

450 Process Geomorphology (3) (Same as Geology 450.)

466 Teaching and Learning Geography (3) Preparation of prospective teachers. Methods, strategies, and understandings needed for effective teaching 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, current literature research, and general topics. Registration required of 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 (1-15) Required for the student not otherwise registered during any semester when students use University facilities and faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.

504 Introduction to Geographical Research (1) Research interests and methods of departmental faculty. Research frontiers in geography. Required of new graduate students. S/NC only.

505 Directed Research (2-6) Research on problems 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.

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.

509 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 implementation in stand alone and distributed computing environments. Prereq: Consent of instructor. (Same as Information Management 531.)

513 Topics in Remote Sensing (3) Applied research using imagery for interpretation and mapping of geographic data. Prereq: 413 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

515 Topics in Quantitative Geography (3) Multivariate analysis applied to problems in geography; research problems utilizing appropriate computer programs; usefulness to geographic research of techniques 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 Processing (3) Concepts and methods in management of geographic information. Database design, manipulation, sampling and analysis. Prereq: Consent of instructor. (Same as Information Management 532.)

518 GIS Project Management (3) Interactions between management, technical, and application aspects of Geographic Information Systems project through simulated mini projects. GIS sites: University GIS, Computer Mapping and Geographic Information Systems or consent of instructor.

519 Graduate Practicum in Cartography/Remote Sensing/GIS (2-6) Prereq: Written consent of department 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) Trends, problems, and methods in geomorphology or other areas of physical geography. Prereq: 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.

536 Topics in Watershed Dynamics (3) Trends, problems and methods in study of watershed processes. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

541 Topics in Urban Geography (3) Analysis of research on urban systems, 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.

591 Foreign Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. May be repeated. Maximum 6 hrs.

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.

599 Geographic Concept and Method (3) Traditional and modern geographical thought; reading, research, and writing skills. Major problems and problems of geography. Prereq: Consent of instructor.

600 Doctoral Research and Dissertation (1-15) P/NP only. E

609 Seminar in Geography (2-3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

631 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.

677 Seminar in Biological Conservation (3) Conduct of original research. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.
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 letters of recommendation, and GRE scores (general). Students are not required to have completed a Bachelor's degree at the time of admission.

A minimum of 24 hours of graded coursework with at least one course from any of the groups listed in #3 above. These courses may be taken while completing other course requirements.

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 graded 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.

The Department offers the thesis option in the master's program. Graduation requires successful oral defense of a written thesis and at least 30 hours of graded coursework.

The comprehensive examination, taken at 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 graded 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) Applications of calculus and differential equations to problems in earth sciences. Examples of diffusion equation in hydrogeology; wave equation in geophysics; mechanical modeling and boundary conditions in structural geology and tectonics. Prerequisites: The Dynamic Earth, Life, and Time, 2 semesters of Calculus.

410 Mineral Science (3) Crystal chemistry of rock-forming minerals. Interaction of electromagnetic radiation and crystalline solids. Optical properties of minerals, visible and infrared spectroscopy, and x-ray diffraction. Laboratory exercises emphasize thin section and x-ray diffractometer methods of mineralogy. Prerequisites: 510. 2 hrs and 1 lab.

411 Optical Mineralogy (3) Laboratory course on principles of optical mineralogy and use of petrographic microscope to identify rock-forming minerals with applications to petrology and environmental mineralogy. Prerequisite: Mineralogy.

412 Elements of X-ray Diffraction (3) Laboratory course on principles of X-ray diffraction. Phase identification, quantitative determination of mineral abundances in mixtures, and crystal structure determination. Prerequisite: Mineralogy.

420 Paleoclimatology (4) Principles of ecological analysis as applied to fossils. Some numerical techniques: 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 stratigraphic distribution. Prerequisite: Paleobiology or consent of instructor. 2 hrs and 2-3 lab hrs.

440 Field Geology (5) Summer field course for advanced undergraduate geology majors and first-year graduate students in geology. Taught off-campus and requires full time for 2 or more weeks. Synthesis of major aspects of geological sciences in societal context. Field techniques demonstrated, practiced, and applied to solution of geological 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, remote sensing imagery. Prerequisites: 101-02. (Same as Geography 450.) 3 hrs and 1-2 lab hrs.

455 Basic Environmental Geology (3) Applications of geological sciences toward comprehension of effects of geological processes on humans and effects of human activities on Earth’s environments. Prerequisite: The Dynamic Earth. 2 hrs and 1-2 lab or field period.

460 Principles of Geochemistry (4) Applications of chemical principles to geologic systems: problem-solving techniques. Phase diagrams, partitioning of trace elements, thermodynamic principles for evaluating stabilities of mineral assemblages, aqueous solutions, and applications of radiogenic and stable isotopes to geologic systems. Prerequisites: Chemistry 120, 121, 122, and Mathematics 141, 142, Calculus I, II. Recommended prerequisite: Geology 330 (Igneous and Metamorphic Petrology) or consent of instructor. 3 hrs and 1-2 hr tutorial.

470 Applied Geophysics (3) Basic principles of geophysical applications in environmental problems. Seismic and electromagnetic methods. Prerequisites: 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. Summer field course off-campus. Requires full time for 2 or more weeks. Prerequisite: 470 or consent of instructor.

475 Physical and Chemical Systems of the Earth (3) Development of physical earth from solar nebula to present. Formation, composition and evolution of hydrosphere, crust, mantle, and core. Interdependence of tectonics, volcanism, plate tectonics, geomagnetism, chemical and isotopic processes of interior, and earth's temperature. Historical perspective on major controversies of past, and problems unresolved today. Prerequisite: 16 hrs of geology courses numbered 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 metallogeny. Prerequisites: 310 and 330 or equivalents. Recommended prerequisite: 460. 1 hr and 1-2 hr lab.

485 Principles of Hydrogeology (3) Physical principles of flow, fluid mechanics, geologic controls. Groundwater analysis, water well design/testing, introduction to transport processes. Prerequisite: The Dynamic Earth, Calculus: Fundamentals of Physics or equiva-
lent, or consent of instructor. (Same as Civil Engineering 485).

486 Hydrogeology Laboratory (1) Application and demonstration of hydrogeological principles in field and laboratory. Prereq or coreq: 485 or Environmental Engineering 535 or consent of instructor.

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

502 Registration for Use of Facilities (1-15) 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

505 Structure of the Southern and Central Appalacchians (2) Structural development of Southern and Central Appalachians from extensional Late Proterozoic–Early Paleozoic to ancient orogenic belts. Prereq: 535 or consent of instructor. 2 hrs and 1 lab.

510 Clay Mineralogy (3) Origin, chemistry, structures, and properties of clay minerals; application of mineralogical techniques in clay mineral studies. Prereq: 310 and 568 or equivalent. 2 hrs and 1 lab.

521 Data Analysis in Geology and Environmental Science (3) Application of statistical and other quantitative techniques using computers to analyze geological data: environmental problems.

530 Petrogenesis of Crystalline Rocks (4) Origin and properties of igneous and metamorphic rocks, magmatic and subvolcanic processes, and physical conditions. Laboratory involves petrographic study of crystalline rocks in thin section. Prereq: 410. 3 hrs and 1 lab.

535 Ground Water Hydrology (3) (Same as Environmental Engineering 535.)

540 Seminar in Local Geology (1) Introduction of geology of Southern Appalachians. 1 hr plus fieldtrips.

544 Paleopedology (3) Field, microscopic, and geochemical analysis of pedogenic clayey residuum and comparison with modern analog soils; interpretation of changes in paleoweathering processes, paleoclimate, and paleoatmospheric chemistry over 4.6 billion years of earth history based on paleosols. Prereq: 340 Stratigraphy and Sedimentation or equivalent, general chemistry, or consent of instructor.

546 Carbonate Sedimentology (4) Environments of deposition of modern and ancient carbonate sediments and diagenesis of resultant rocks; field and laboratory analysis of carbonate minerals and preparation of scientific reports. 3 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, provinces, sections, and districts. May be repeated with consent of instructor. Maximum 6 hrs.

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 isotope fractionation and applications to geologic systems. Isotope exchange, variations in natural waters, diagenetic, hydrothermal and metamorphic systems. Prereq: General Chemistry or equivalent.


568 Geochemical Analysis (3) Collection and treatment of geochemical data using electron microprobe, x-ray fluorescence, and atomic absorption spectro-photometry techniques. Prereq: 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 Appalachians, Alpids, 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; 480; or Environmental Engineering 553 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 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.

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 Hyrogeology (3) May be repeated with consent of department. Maximum 9 hrs.

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**German**

See Modern Foreign Languages and Literatures

**Health and Safety Sciences**

(College of Human Ecology)

**MAJORS**

**DEGREES**

**Human Health**

- Public Health
- M.P., M.S., M.P.H.
- Safety

**Delores Smith, Interim Head**

**Professors:**
- Gorski, June, Dr.P.H. UCLA
- Hamilton, Charles B. (Liaison), Dr.P.H. Oklahoma
- Kirk, Robert H., H.S.D. Indiana
- Wallace, Bill C. (Liaison), Ed.D. Northern Colorado

**Associate Professors:**
- Caney, Paula (Liaison), Ph.D....
- Clarke, Barbara, Ph.D. Virginia Tech
- Keel, Martha, M.S. Tennessee
- Pursley, R. Jack, Ph.D. Iowa

**Assistant Professor:**
- Klein, Diane S., Ph.D. Arizona State
- 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 Human Health Promotion and Health Education and in Public Safety; and to 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 biomedical sciences 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, visit http://hhs.he.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.
2. Minimum 21 hours in primary specialization: 530, 540, 650, 655, 660 and 6 hours of electives.
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.) F

405 Alcoholism and Alcohol Education (3) Problems of alcoholism. Factors which make alcoholism serious in health and safety problem. Various types of instructional/educational and intervention programs.

406 Death, Dying and Bereavement (3) Aspects of dying, death and handling trauma of loss. Medical, financial, emotional, 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 women consumers in nation's health service delivery systems. Health problems/concerns of women and techniques for prevention, maintenance and/or correction. (Same as Women's Studies 425.) E

430 Suicide and Crisis Intervention (3) Factors which make suicide serious health problem. Assessment, intervention, and prevention techniques.

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,Su

455 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 (1-15) 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 theory, techniques, materials used in school, community, or health care facility. Sp

530 Health Promotion and Health Education Program Development: Theories and principles of health promotion program development; methodology, marketing, public relations. Health education as vehicle for health promotion. F

540 Evaluation in Health Promotion and Health Education (3) Evaluation principles and methodologies as related to health promotion products, processes and programs. Construction of instruments for use in assessing health education outcomes. Sp

570 Special Topics (1-3) For graduate students, in-service teachers, and other health professionals. Health/wellness or health promotion issues. May be repeated. Maximum 12 hrs.

590 Research Methods in Health (3) Basic research techniques in variety of health settings. Development of research skills and problem identification for re- search topic. (Same as Public Health 590.) F

593 Directed Independent Studies (1-3) Individual identification and study of health/wellness or health promotion program issue. Specific proposal to instructor before registration. May be repeated. Maximum 12 hrs. E

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

601 Internship/Research in Safety and Health (3-6) (Same as Safety 601.) F

610 Critical Analysis of Writing and Research (3) Analysis of writing and research in health related areas. F

620 Advanced Research Techniques in Health (3) Advanced theory and techniques of research design and methodologies in health discipline. Prereq: 590, 610, Sp.

650 Health Aspects of Gerontology (3) Knowledge and understanding of biological, psychological and sociological aspects of aging as related to health and wellness of individual. (Same as Public Health 650.) Su

655 Seminar in Nation's Health (3) Comprehensive study of definition, determinants, resources and health status of nation. (Same as Public Health 655.) F

660 International Health (3) Study of quality of health, health promotion and health services in countries throughout world. (Same as Public Health 660.) 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 enrollment 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 38 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, formal written proposal by the student, and completion of an additional research methods course. 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.uitk.edu/pubhealth.
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 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 towards 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 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 students 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 Administrative Services Assistant in the Office of Graduate Admissions.

COURSE REGISTRATION

Non-degree students must obtain permission from the M.P.H. program director 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 workplaces that revolve around issues relative 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 (1-15) 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 many other academic and professional disciplines. Prereq: 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 recognizing health as individual’s response to diverse and dynamic world. Principles of occupational safety and health. Survey of contemporary issues and their implications for health today and in future. F
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 types of 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: Introductory 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, hypothesis formulation, research design, data and error sources, measures of frequency and association, etiologic reasoning, disease screening, and injury control. Prereq: or coreq: 530. F,Sp
550 Principles and Practices of Community Health Education (3) Theorized and/or practiced organization of community health education; opportunities for skill development in variety 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 skills in a realistic setting. Prereq: 550 or consent of instructor. Sp
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 diagnoses, 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 Ecology 585, Counselor Education and Counseling Psychology 585, Exercise Science 585, Nursing 585, Psychoeducational Studies 585, Social Work 585, and Sociology 585.)
587-88-89 Internship (3,3,3) Internship (community health education, gerontology, or health planning/management) 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. 589: available only for approved extended placements. S/NC only. E
590 Research Methods in Health (3) (Same as Health 590.) F
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.) Su
655 Seminar in Nation’s Health (3) (Same as Health 655.) F
660 International Health (3) (Same as Health 660.) Sp

Safety

Graduate study with a major in Safety (thesis and non-thesis options) leads to the
Master of Science degree. Graduate students may concentrate in safety management or in emergency management. The M.S. degree program requires completion of 33 semester hours. Degree requirements include completion of the 18-hour core curriculum and completion of a concentration area (15 hrs.). Concentration course options include specific courses offered by the Departments of Human Resource Development, Industrial Engineering, Civil and Environmental Engineering, and Political Science (Public Administration) in addition to those offered by the Department of Health and Safety Sciences. A list of courses is available for each concentration. Students may elect an internship experience with a private industry or non-profit organization to fulfill part of their course requirements. Curricular experiences will assist graduates in preparation for certified safety professional (CSP) 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 and required concentration courses on an evening class schedule enables those working full-time in a safety-related field to pursue the M.S. degree with a major in Safety on a part-time basis.

For more information, refer to the website: http://hss.he.utk.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 decision solution strategies; and contributions of sports medicine to safety. 3 hrs and 2 labs. Sp

452 Safety Principles and Practices (3) General principles, practices, and procedures in occupational and community safety. Historic and present safety issues, use of sampling instruments available to safety practitioner for evaluating exposures of workers to physical stresses and airborne contaminants. F

460 Fire Risk Management (3) Development, implementation, and management of comprehensive fire safety program. Basic fire risk management concepts, interpretation of codes and exposure to basic fire analysis techniques. Prereq: Senior standing or consent of instructor. Su

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

502 Registration for Use of Facilities (1-15) 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; findings of current research on behavioral sciences as related to variation incidence of accidents. Sp

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. F

536 Safety Instrumentation (3) Selection, calibration, maintenance, and use of sampling instruments available to safety practitioner for evaluating exposures of workers to physical stresses and airborne contaminants. F

537 Advanced Emergency Management (3) Advanced study in emergency management; response and recovery. Theory and practice in identification of appropriate emergency warning systems; defense, and recovery. May be repeated. Maximum 12 hrs. E

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.

593 Directed Independent Study (1-3) Individual study and identification of problem in safety. 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

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 DEGREES

History ............................................. M.A., Ph.D.

Todd A. Diacon, Head

Professors:

Bergeron, Paul H. (Emeritus), Ph.D. Vanderbilt

Brommett, Palmira R., Ph.D. .......... Chicago

Chmielewski, Edward V. (Emeritus), Ph.D. ....................... Harvard

Cutler, E. Wayne, Ph.D. .............. Texas

Farris, W. Wayne, Ph.D. .......... Harvard

Finger, John R. (Emeritus), Ph.D. ........ Washington

Haas, Arthur G., Ph.D. .......... Chicago

Hao, Yen-Ping (Emeritus), 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

Utley, Jonathan G. (Emeritus), Ph.D. ........ Illinois

Wheeler, W. Bruce, Ph.D. ........ Virginia

Associate Professors:

Appler, Janis, Ph.D. ............ California (Riverside)

Ash, Stephen V., Ph.D. ............ Tennessee

Bast, Robert J., Ph.D. ............ Arizona

Bohstedt, John, Ph.D. .......... Harvard

Brandt, John P., Ph.D. .......... Cornell

Burman, Thomas E., Ph.D. ........ Toronto

Diacon, Todd A., Ph.D. .......... Wisconsin

Fleming, Cynthia G., Ph.D. ........ Duke

Glover, Lorri, Ph.D. ............. Kentucky

Higgs, Catherine A., Ph.D. ........ Yale

Liu, Lu, Ph.D. .................. California (San Diego)

Sahadeo, Jeff, Ph.D. ............ Illinois

White, George, Jr., Ph.D. ........ Temple

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 concentrations 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 baccalaureate 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 under another discipline may be applied toward the M.A. degree. Except by prior approval of the Director of Graduate Studies, a student's course work 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 are 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. The primary field is examined by a two-hour written followed within one week by a one-hour oral examination with the single grade of pass/fail given at the conclusion of the oral examination. No examination is given on the secondary field.

M.A. Fields

United States (colonial to present)

Premodern Europe

Modern Europe

Asia
Retirement 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.

THE DOCTORAL PROGRAM

Admission Requirements
1. Successful completion of the M.A. degree from an accredited institution.
2. Acceptable scores on the Graduate Record Examination (general).

Residence and Coursework
Before being admitted to doctoral candidacy, a student must:
1. Complete History 510 at UT (may be waived for comparable experience elsewhere).
2. Spend two consecutive semesters in residence.
3. Complete 9 hours in one Group I doctoral field. There is no minimum hours requirement for a Group II field. Complete 9 hours in one Group III field, including the appropriate 511, 512, or 513 course and two additional courses at the 500 level. The Group III field must be in a different geographic area from the Group II field. Courses taken to fulfill M.A. degrees may be counted toward all field requirements.
4. Fulfill the foreign language requirement.
5. Complete two 600-level research seminars. (One must be completed at UT.) Students who have completed a master’s thesis need complete only one research seminar (must be taken at UT), and History 621.
6. Maintain a 3.0 overall grade-point average in graduate work attempted.
7. Complete 24 hours of graduate coursework (21 hours graded A-F) at UT beyond that required for the M.A. Up to 6 hours may be taken outside of the department.
8. Except by prior approval of the Director of Graduate Studies, a student’s coursework must be at the 500 level or above.

Language Requirements
Students must demonstrate competence in one foreign language through coursework or examination. The student’s doctoral committee may specify any other languages or research tools, such as statistics, essential for the student’s preparation. The foreign language requirement must be fulfilled before taking the comprehensive examination.

Group III (Teaching Field) Examination
This is a one-hour oral exam which must be completed at any time before the comprehensive examination is taken. If a student fails this, he or she may retake the exam one time only and must do so the following semester.

Comprehensive Examination
The comprehensive examination is to be taken no later than the semester following the term in which the student has completed the residence, coursework, and language requirements. A student stands examination in one field selected from Group I and one field selected from Group II below. Both parts are 8 hours, written, and taken during the same semester. A general oral exam will be taken following the successful completion of the two written portions. The two written and one oral exams are separate examinations, and Group I must be passed before taking Group II, and the latter passed prior to taking the oral portion. A student who fails any one of the three parts (Group I or Group II or the Oral) which constitute the Comprehensive Exam must repeat the failed exam the following semester, excluding summer. A second failure on any one of the three parts (regardless of which one) will cause the student to be dropped from the History graduate program. Likewise, a student who does not repeat a failed exam within the allotted time (one semester) will be dropped from the program.

Admission to Candidacy
Upon successful completion of the above requirements, a doctoral student may be admitted to candidacy.

Doctoral Fields
Group I:
- Premodern Europe
- Modern Europe
- United States (colonial to present)

Group II:
To be defined by the student’s doctoral committee from within one of the following fields:
- United States
- Colonial and Early Republic
- 19th century
- 20th century
- Regional
- Military and Foreign Relations
- Social and Cultural
- American Political
- European
- Medieval
- Early Modern
- Modern
- Political and Diplomatic
- Intellectual and Cultural
- Social and Economic
- National Fields

Group III (Examined Teaching Field):
- World History
- Western Civilization
- U.S. Civilization

Dissertation and Defense
Original research forms the basis for the dissertation. Doctoral candidates must register for a minimum of 3 hours of 600 Dissertation Research each semester and must complete 24 hours of dissertation credit. A final oral defense is given on the dissertation in its historical context. The program must be completed within eight years from admission as a potential candidate.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E.
502 Registration for Use of Facilities (1-15) 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 Foundations of Graduate Study in History (3) Assumptions and methods of historians. Required of all candidates for advanced degrees. F
511 Teaching World History (3) Methodology, conceptualization, historiography, text-book selection and syllabus construction to prepare students to teach courses in world history.
512 Teaching Western Civilization (3) Methodology, conceptualization, historiography, text-book selection and syllabus construction to prepare students to teach courses in western civilization.
513 Teaching United States History (3) Methodology, conceptualization, historiography, text-book selection and syllabus construction to prepare students to teach courses in U.S. history.
521 M.A. Readings (3) Directed readings in preparation for M.A. examinations. Open only to master’s candidates in history. May be repeated. Maximum 6 hrs. S/NC only.
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 intra-national 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 U.S. 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.
559 Topics in Jewish History (3) Reading seminar: secondary sources on Jewish history. 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.

580 Topics in History (3) Reading seminar: secondary sources for new topics. Focus varies. May be repeated. Maximum 15 hrs.

585 Topics in World History (3) Reading seminar in transnational themes involving analysis of two or more world cultures. Focus varies. 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

621 Directed Readings (3) Directed readings to prepare candidate for doctoral comprehensive examination. May be repeated. Maximum 1 per doctoral field. S/NC only.

632 Seminar 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.

658 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

(College of Human Ecology)

MAJOR

Human Ecology ........................................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 Application for Admission file, departmental application, Graduate Record Examination (GRE) scores for the general section, and three Graduate 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; and Nutrition. Concentration areas are child and family studies, community health, human resource development, nutrition sciences, tax and 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, and humanities, 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 Council sets minimum requirements for the doctoral degree.

More specific information about the course of study is given under the individual academic departments that administer the Ph.D. concentrations.

MINOR IN GERONTOLOGY

An interdepartmental/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 650, Nutrition 518, Public Health 523, Social Work 566, Sociology 415, Psychoeducational 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.


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.

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, Virginia, or West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE COURSES

450 Special Topics: Human Ecology (1-3) Study in selected professional area within College of Human Ecology. Topics vary. May be repeated. Maximum 6 hrs.

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or benefits from services before degree is completed. May not be used toward degree requirements. May be repeated. S/NC 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. Prereq: At least 9 hours 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. Prereq: Consent of instructor. E


580 Special Topics in Home Economics Education (1-3) Current issues and trends in home economics. Prereq: Consent of instructor. May be repeated. Su.A

581 Directed Study in Home Economics Education (1-3) Prereq: Consent of instructor. May be repeated. E

585 Seminar in Gerontology (1) Scope of gerontology as discipline and as related to other academic and professional disciplines. Speakers both internal and external to UT. Prereq: 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, Psychoeducational Studies 585, Social Work 585, and Sociology 585.) S/NC only.
630 College Teaching and Professional Roles in Human Ecology (3) Instructional effectiveness, techniques, organization and evaluation in college teaching. Systems and ecological theoretical 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.

Michael Lane Morris, Interim Head

Professors:
Brewer, Ernest W. (Liaison), Ed.D. ........................................ Tennessee
Campbell, Clifton P. (Emeritus), 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. (Emeritus), 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

Associate Professors:
Kupritz, Virginia, Ph.D. .................. Virginia Tech
Stout, Vickie J., Ed.D. .................... Tennessee

Assistant Professors:
Bartley, Sharon, Ph.D. .......................... Tennessee
Hastings, Shirley, Ph.D. .................. Oklahoma State
Lim, Doo, Ph.D. ................................. Illinois
Pierce, Randal, Ph.D. ........................... Ohio State
Sorter, Ann, M.S. .................................. Clemson

The Department of Human Resource Development advances economic development 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 workshop 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 two concentrations, each providing opportunities for specialized interests. Both concentrations require 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 the Graduate Application for Admission, 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 2.7 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 scores are required of all applicants except for those applying for the teacher licensure concentration.

Teacher Licensure Concentration applicants are to submit the Graduate Application for Admission 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 for 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 591 and an oral comprehensive examination.

Teacher Licensure Concentration is a 36-hour thesis 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, 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 the Graduate Application for Admission, three letters of reference from persons familiar with their potential for success in doctoral work, a statement describing personal career objectives, and a sample of written work 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.

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 applications, 9 hours minimum; research methodology 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 project.

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 update, check the homepage of Department of Human Resource Development (http://hrd.he.uky.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 Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE COURSES

455 Learner and Program Evaluation (3) Assessing effectiveness of training or educational programs; developing performance-based measures; evaluating job performance; and measuring learner progress. Prereq: 504. Computer Applications or equivalent, and 320 Program Planning for Training, Development and Education.

476 Supervised Occupational Experience (3) Practical field 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.

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 program proposals, assessment of personal competencies, values, goals, and training program design and administration.

502 Registration for Use of Facilities (1-15) 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 and in jobs. Collecting, analyzing, and reporting follow-up data appropriate for making program improvements. Prereq: Consent of instructor.

506 Developing Organizational Resources (3) Strategies for developing human and organizational resources through community partnerships and leadership. Effective utilization of human resources through active learning programs.

509 Internship in Human Resource Development (3) Practical field experiences in selected settings under supervision of practitioner and departmental representative. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

510 Foundations of Human Resource Development (3) Historical, philosophical, economical, social, and psychological foundations of vocational, technical, and adult education and human resource development; fundamental principles and contemporary objectives.


512 Human Resource Management (3) Process systems approach to human resource management: interdependent human resource activities (planning, work design, staff development, training and development, compensations, etc.) and organizational goals.

513 Special Topics in Human Resource Development (1-3) Specific objectives, activities, and evaluation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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.

515 Microcomputer Operations and Programming in Education (3) Operating procedures and BASIC programming for education 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 and sort algorithms, and mapped 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 familiar with consumer services, business, and marketing, technology and/or industrial education.

522 Professional Practices for Educators (3) Topics essential to effective classroom teaching; evaluation of students, youth organizations, advisory committees, classroom management, and strategies for success in teaching and classroom management. Prereq: Consent of instructor.

551 Supervision of Industrial Education Programs (3) Techniques used to improve industrial education programs. Staff development, curriculum improvement, and program updating techniques. Prereq: 455 or equivalent.

552 History and Philosophy of Industrial Education (3) Societal, political, and economic events that have contributed to the development of industrial education. Philosophical problems: justification, values, principles and concepts of industrial education. Prereq: Consent of instructor.

553 Planning Technical Education Facilities (3) Designing technical education specifications, site selection, and working relationships with other professionals involved in process of planning technical-education facilities. Prereq: Consent of instructor.

554 Program Planning (3) Instructional systems attending to analysis, design, development, implementation, and evaluation of trade, technical supervisor and related training. Prereq: Curriculum development course or consent of instructor.

555 Curriculum Planning (3) Developing performance-based, criterion-referenced instructional programs.

556 Organizational Development (3) Strategies and interventions for organizational development: training and development; managing personnel; assessing and managing organizational change and consultant’s role. Prereq: 512 or consent of instructor.

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 and conducting a comprehensive program evaluation in 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 of diverse international or multinational systems in highly industrialized countries. In-school training programs, out-of-school training systems, update training of incumbent workers, retraining displaced workers, transfer of new technologies, 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 and maintaining funded programs, and closing out projects at end of funding support.

566 Self-Directed Work Teams (3) Theory and practice of implementing self-directed work teams, motivating employees, increasing employee productivity via teams and related issues.

574 Analysis of Teaching for Professional Development (3) Strategies and techniques for developing effective teaching or educational programs. Prereq: Admission to doctoral program. May be repeated. Maximum 12 hrs. S/NC only.

575 Professional Internship in Teaching (1-15) Intensive in-service and graduate experiences in professional settings in public schools. Enrollment limited to postbaccalaureate students in professional year program. Prereq: Admission to Teacher Education program. May be repeated. Maximum 12 hrs. S/NC only.

591 Clinical Studies (1-4) Group and individual seminars for clinical work in six-month internship. Application and development of personal and professional competencies. Completion and presentation of portfolio and analysis of teaching project. Coreq: 575.

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

601 Theory and Practice in Training and Development (3) Theory and application of research related to training and development; transfer of learning, designing effective learning situations, and creation of corporate learning environments. Conceptualization and critical analysis of theoretical research and theories related to training and development in field of human resource development. Prereq: Admission to doctoral program.


606 Qualitative Research in Human Resource Development (3) Theory and application of qualitative approaches to social science and human resource development research. Ethnographic methods to obtain in-depth information about behaviors and beliefs of people in natural settings. Prereq: Permission to take courses; structured interviews using heuristic elicitation methodology, participant/observation and case studies. Prereq: Admission to doctoral program.

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 or coreq: 360. Use of method and introduction to research. May be repeated for 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 6 hrs. S/NC only.

613 Special Topics in Human Resource Development (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.
**Industrial and Organizational Psychology**

(Indian Business Administration)

**MAJOR**

- Industrial and Organizational Psychology ........................................... Ph.D.

**DIRECTOR**

Robert T. Ladd (Liaison), Director

Committee:

- Fowler, Oscar S., Management
- James, Lawrence R., Management
- Larson, John M., Jr. (Emeritus), Management
- Rentsch, Joan R., Management
- Rush, Michael C., Management
- Schumann, David W., Marketing, Logistics & Transportation
- Woehr, David J., Management

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 Graduate Studies 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 Student Services (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 Graduate Application for Admission (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 Student Services 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 90 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 Research 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:**

<table>
<thead>
<tr>
<th>Course Core</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I/O Psychology Core</td>
<td>9</td>
</tr>
<tr>
<td>600, 656, 569</td>
<td></td>
</tr>
<tr>
<td>Research Core</td>
<td>12</td>
</tr>
<tr>
<td>Statistical Principles (Statistics 537 &amp; 538 or equivalents)</td>
<td>9</td>
</tr>
<tr>
<td>Multivariate Statistics (Statistics 579, 679 or equivalent)</td>
<td>9</td>
</tr>
<tr>
<td>Advanced Research Methods (605 or equivalent)</td>
<td>9</td>
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<tr>
<td>General Psychology Core</td>
<td>9</td>
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</tbody>
</table>

One course in each of the following areas: biological bases of behavior, cognitive bases of behavior, history and systems of psychology.

I/O Psychology Seminars

- 600 level IOPSY courses, from a program committee approved list.
- Approved Electives

Courses supporting the student's course of study.

- Supervised practicum, internship, or field training (690)
- Ethics (635 or equivalent)
- Dissertation (600)

**TOTAL** 90

**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 Kentucky, Virginia, or West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

**GRADUATE COURSES**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Hours</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>502 Registration for Use of Facilities (1-15)</td>
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<tr>
<td>Required for the student not otherwise registered during any semester when 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.</td>
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<tr>
<td>525 Research in Industrial/Organizational Psychology (1-3)</td>
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<tr>
<td>Available only to students admitted to program by prearrangement with program director. May be repeated. Maximum 8 hrs. S/NC or letter grade.</td>
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<tr>
<td>567-68 Proseminar in Industrial/Organizational Psychology (3,3)</td>
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<tr>
<td>Basic thought, concepts, and issues required for advanced graduate study in industrial and organizational psychology. Must be taken during first year of study in program. Consent of instructor required for non-program students.</td>
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<tr>
<td>569 Applied Measurement for Industrial/Organizational Psychology (3)</td>
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<tr>
<td>Basic techniques for collection and evaluation of individual and organizational data using both classical and modern psychometric techniques for test construction and confirmation. Requires familiarity with classical test theory and exploratory and confirmatory factor analyses.</td>
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<tr>
<td>600 Doctoral Research and Dissertation (3-15)</td>
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<td>P/ NP only. E</td>
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<tr>
<td>605 Advanced Research Methods in Psychology (3)</td>
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<tr>
<td>Critical analysis of new and evolving techniques for psychological research; new statistical and psychometric methods.</td>
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<td>610 Individuals in Organizations Seminar (3)</td>
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<tr>
<td>Bridging principles and processes which link individual attributes with more macro organization concerns: culture, climate, and group decision-making.</td>
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<tr>
<td>611 Seminar in Organizational Leadership (3)</td>
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<tr>
<td>Current theories, concepts, and issues associated with psychology of organizational leadership. Prereq: 567-68 or consent of instructor.</td>
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<tr>
<td>612 Seminar in Work Motivation (3)</td>
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<tr>
<td>Current theories, concepts, and issues associated with psychology of work motivation. Prereq: 567-68 or consent of instructor.</td>
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<tr>
<td>613 Seminar in Performance Appraisal (3)</td>
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<tr>
<td>Current issues, problems, and research in performance appraisal and criterion development; applications in compensation. Prereq: 567-68 or consent of instructor.</td>
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<tr>
<td>614 Seminar in Employee Selection (3)</td>
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<tr>
<td>Current issues, concerns, and methods used in employee selection. Prereq: 567-68 or consent of instructor.</td>
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<tr>
<td>615 Seminar in Organizational Training and Development (3)</td>
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<tr>
<td>Current issues, problems, and research in training and development. Prereq: 567-68 or consent of instructor.</td>
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<tr>
<td>625 Topics in Organizational Psychology (3) Topics vary.</td>
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<tr>
<td>May be repeated. Maximum 9 hrs.</td>
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<tr>
<td>626 Topics in Industrial Psychology (3) Topics vary.</td>
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<tr>
<td>May be repeated. Maximum 9 hrs.</td>
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<tr>
<td>627 Structural Equation Models in Organizational Research (3)</td>
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<tr>
<td>Issues related to analysis of organizational data using structural equation and related techniques.</td>
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<tr>
<td>628 Personality Assessment (3)</td>
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<tr>
<td>Review of key domains of social cognition: measurement systems which use individual differences in social-cognitive biases as basis for measuring personality.</td>
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<tr>
<td>635 Ethical and Professional Issues in Industrial/Organizational Psychology (3) Issues involved with ethical practice in research, academic, organizational, and consulting situations.</td>
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<tr>
<td>690 Supervised Practicum, Internship or Field Training in Industrial/Organizational Psychology (1-18) One credit hour per 30 hours of practice. S/NC or letter grade.</td>
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</tbody>
</table>

**Industrial Engineering**

(Indian Business Administration)

**MAJOR**

- Industrial Engineering .......... M.S., M.S.-MBA

**DIRECTOR**

A. B. Badiru, Head

Professors:

- Badiru, A. B., PE, Ph.D. .......... Central Florida
- Bontadelli, J. A. (Emeritus), PE, Ph.D. .......... State University
- Claycombe, W. W. (Emeritus), PE, Ph.D. ... VPI
The Department of Industrial Engineering offers a graduate program leading to the Master of Science degree with a major in Industrial Engineering, engineering management, manufacturing systems engineering, and product development and manufacturing. The Ph.D. with a major in Engineering Science is available through the Department of Mechanical, Aerospace, and Biomedical Engineering with a concentration in industrial engineering.

ADMISSION REQUIREMENTS

Applicants must first submit a formal Graduate Application for Admission. In addition to the minimum requirements of the Graduate Council, the Department of Industrial Engineering requires the following: (1) Three rating forms or letters of reference; (2) GRE scores; and (3) Essay (2 double-spaced pages - contact department for current topic). The graduate committee in the department sets any prerequisite courses or other measures that apply to the particular situation of the applicant. The department and the Office of Graduate Admissions must be notified of any change in the entering date after admission has been granted.

THE MASTER’S PROGRAM

Students who enroll in the Master of Science degree may select a concentration in industrial engineering, engineering management, product development and manufacturing, or manufacturing systems engineering. Each of these concentrations, with the exception of the product development and manufacturing, allows a student to select either a thesis or non-thesis option. Students who select the manufacturing systems engineering concentration of the dual degree program must select the non-thesis option. The thesis option requires 27 hours of coursework and 6 hours thesis. The non-thesis option requires 30 hours of coursework and a 3-hour design project; the engineering management concentration requires an additional 3 hours.

Industrial Engineering

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. This concentration is fully supported off-campus utilizing electronic media for videotaping and interactive distance teaching methods.

Manufacturing Systems Engineering

Under the manufacturing systems engineering concentration, students learn strategies for improving product quality, implementing various production strategies, analysis of production planning and scheduling systems, and supplier and distribution integration. Dual degree students can select manufacturing systems engineering as an option.

Product Development and Manufacturing

The product development and manufacturing concentration is a non-thesis option, available only to students taking the dual M.S.-MBA program.

DUAL M.S.-MBA PROGRAM

The College of Business Administration and the College of Engineering offer an integrated program leading to the conferral of the Master of Business Administration degree with a major in Business Administration (concentration in operations management) and the Master of Science degree with a major in Industrial Engineering (concentration in manufacturing systems engineering or product development and manufacturing).

The Industrial Engineering program is also open to students with undergraduate engineering majors other than industrial engineering.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate an increasingly complex body of knowledge for rapid introduction of new products to the marketplace. The objective of the dual degree program is to prepare graduates to take a leading management role in companies that must react quickly to a dynamic market where forces of competition require rapid changes in design and manufacturing and a short product development cycle.

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 Office of Graduate Admissions 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 their application the intent to pursue the dual M.S.-MBA program and the Industrial Engineering major (refer to the MBA program for separate instructions). Students accepted for both the MBA and the M.S. with a major in Industrial Engineering degree programs will be assigned to Dual Program Committee advisors, who will be responsible for course approval and supervision of the students’ 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 Graduate Admissions for international students.

Curriculum

All engineering students enrolled in the dual program must complete common coursework designed to provide them with an integrated, multidisciplinary teamwork experience. The MBA curriculum consists of 33 hours of common coursework in the College of Business Administration and 15 hours of common coursework in the College of Engineering. Engineering common coursework includes a culminating 3-hour integrated project course requiring a comprehensive report, and a final examination as required by the Dual Program Committee, to be taken during the first session of summer following the second year.

During the second year dual degree candidates will take courses in their engineering major. The coursework for each option is designed to provide students with a concentration in their major and advanced skills to accomplish their teamwork assignments.

Curriculum for Dual M.S.-MBA Degree

<table>
<thead>
<tr>
<th>Fall - First Year</th>
<th>Spring</th>
<th>Fall - Second Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 511 MBA Core I</td>
<td>BA 513 MBA Core III</td>
<td>IE 509 Project Management</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>BA 512 MBA Core II</td>
<td>IE 506 Product Selection and Evaluation</td>
<td>IE 503* Survey of Manufacturing Systems Engineering</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>IA 504 Product Development Process</td>
<td>IE 511** Business Planning and Commercialization</td>
<td>IE 509 Project Management</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>IE 510 Advanced Topics in Manufacturing Systems</td>
<td>IE 524 Advanced Integrated Manufacturing Systems</td>
<td>IE 510 Advanced Topics in Manufacturing Systems</td>
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<tr>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>IE 524 Advanced Integrated Manufacturing Systems</td>
<td>IE 509 Project Management</td>
<td>IE 509 Project Management</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
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<tr>
<td>IE 509 MBA “hub” course elective</td>
<td>IE 522 Optimization Methods in Industrial Engineering</td>
<td>IE 512** Process Development and Manufacturing</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
Market Feasibility 3
Elective (IE 514, 519, or 523) 3
IE 594 Culminating Integrated Project Report 3
TOTAL 66-69

*The IES03 class is required for students enrolling in this option with undergraduate degrees in disciplines other than Industrial Engineering.
**Students in manufacturing systems engineering concentration may substitute other selected IE courses for these courses.

The dual degree candidate must satisfy the curriculum and graduation requirements of the engineering major being pursued and the College of Business Administration. Students withdrawing from the dual degree program before completing both degrees will not receive credit toward graduation in either degree program for courses taken 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 15 semester hours of the common program courses completed in the College of Engineering may be counted toward the MBA degree program.

CERTIFICATE IN MAINTENANCE AND RELIABILITY ENGINEERING
The College of Engineering offers a certificate program in maintenance and reliability engineering. The program is designed primarily for part-time students in that several of the courses are available through distance education. The 12-credit certificate is earned by completing 438 and 448, which are cross-listed among all participating departments in the College of Engineering. In addition, two elective courses selected from a list of courses provided by the participating departments. Currently, the available elective courses are Industrial Engineering 516 and 591, Mechanic Engineering 534 and 549, and Nuclear Engineering 513 and 514. Completing the certificate requires 12 hours of study in maintenance and reliability engineering.

Industrial Engineering

GRADUATE COURSES
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.


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, aviation, industry. Prereq: 306 Simulation. Coreq. 401. Sp


421 Information Systems Analysis and Design (3) Concepts engineering approach to analysis, design, development, and implementation of systems of information. Informational requirements of industrial engineering systems. Utilization of relevant software packages. Prereq: Senior standing or consent of instructor. 2 hrs and 1 lab. F

422 Senior Industrial Engineering Problems Analysis (3) Application of industrial engineering to field assignments in local organizations, problem definition, analysis and presentation. Prereq: Expected term of graduation or consent of instructor. E

423 Industrial Safety (3) Accident causation, losses, and investigative techniques. Role of human, task, machine, and environment in accident prevention. Safety standards, codes, and laws. Product liability, design, evaluation, and management of safety organizations and programs. Hazard recognition, analysis, control and risk assessment, systems safety and related techniques. Prereq: Senior standing, 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 and improvement 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 tools. Prereq: 300 or consent of instructor. Prereq: 300 Engineering Data Analysis and Process Improvement. Sp

483 Introduction to Reliability Engineering (3) (Same as Nuclear Engineering 483, Chemical Engineering 483, and Mechanical Engineering 483.)

484 Introduction to Maintenance Engineering (3) (Same as Nuclear Engineering 484, Chemical 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. S/NC only.

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any summer when UT enrolls 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 Industrial Engineering Methods Review (3) Survey of industrial engineering tools and techniques applied to analysis, design, and improvement of manufacturing systems. Required of dual degree students of MS/ MBA Program. Not to be counted toward degree requirements. Prereq: Admission to dual MS/MBA program. S/NC only.

504 Product Development Process (1) (Same as Mechanical Engineering 504).

506 Product Selection and Evaluation (2) (Same as Mechanical Engineering 506).


509 Project Management (1) Venue for multidisciplinary teams to design and manufacture tasks of product to be developed. Project management (budget and schedule), assignment of tasks for team members, and concurrent design and manufacturing. Design concepts and product features reviewed by potential customers/clients. Prereq: Consent of instructor. May be repeated. Maximum 3 hrs. (Same as Mechanical Engineering 509.)


511 Business Planning and Commercialization (3) Complex issues of product development and business planning required to deliver new product from concept to market. Strategic issues that emerge during product development cycle, beginning with concept to product development to commercialization to eventual product introduction or dismissal. Management practices for successful product development and product management. Prereq: Consent of instructor.

512 Process Development and Market Feasibility (3) Manufacturing process technologies available to effect-time responsive manufacturing products with specific new products that have been identified and designed. Product cost estimating, estimating capital requirements and identifying, capacity analysis, layout and design of facilities, identification of potential suppliers, and analysis of business plan. Prereq: 511 and 524.

513 Facilities Planning and Design (3) Modern material handling techniques, computer-aided layout techniques, application of operating research models, and use of these to design manufacturing facilities. Prereq: Introduction 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 information flow and feedback in decision support systems, 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; distribution requirements planning; and other selected topics. Prereq: 402 or consent of instructor.

516 Statistical Methods in Industrial Engineering (3) Use of classical statistical techniques to industrial engineering problems. Statistics and statistical thinking in managerial context of organizational improvement; descriptive statistics; and introduction 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. Prereq: 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 testing for product acceptance. Prereq. 516.

518 Advanced Engineering Economic Analysis (3) Application of engineering economic analysis in com-
plex decision situations. Inflation and price changes; uncertainty evaluation using nonprobabilistic techniques; capital financing and project allocation; evaluations of results of productivity improvement, investment in owned utilities, and public works projects; probabilistic risk analysis including computer simulation and decision trees; multiattribute decision analysis; and other advanced methodologies. Prereq: 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 human, machine, and work system interfaces. Human as biophysical system; human information processing; minimization of human error; anthropometry, anatomy and physiology; control workloads; effects of environmental factors: temperature, lighting, weightlessness, and vibration on humans; manual materials handling problems; human machine interfaces and office ergonomics; design of displays and controls; hand tool design; and cumulative trauma injuries. Prereq: Probability and Statistics for Scientists and Engineers I or consent of instructor.

520 Human Factors and Product Safety Engineering (3) Role of human factors and safety engineering, legal implications in product design, product liability, system safety, product liability failure analysis, Product testing, liability, and system safety failure analysis techniques. Case histories of accident investigations, reconstruction, causality, and product liability litigation. Prereq: 519 or consent of instructor.

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-machine interface; modeling techniques; questionnaire and survey design; experimental design, and other selected topics. 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; special numerical optimization methods; case studies; game theory; and dynamic programming. Prereq: Operations Research or Engineering Management 537.

523 Mathematical Programming (3) (Same as Management Science 531.)

524 Advanced Integrated Manufacturing Systems (3) Different types of manufacturing systems. Integration of distributed systems and applications of numerical control and automation. Conversion from functional layouts to cellular manufacturing. Process planning for discrete products, measurement, and inverse engineering principles and other selected topics. Prereq: 401 and 508, or consent of instructor.

525 Systems Modeling and Simulation (3) Modeling of discrete systems using current simulation software and Monte Carlo simulation. Problem definition, input distributions, output data analysis, model validation and verification, variance reduction techniques, animation of models, and design of simulation experiments. Case studies in variety of domains for simulation modeling. Prereq: Consent of instructor.

526 Advanced Applications of Systems Modeling and Simulation (3) Modeling of discrete systems using current simulation software and Monte Carlo simulation. Problem definition, input distributions, output data analysis, model validation and verification, variance reduction techniques, animation of models, and design of simulation experiments. Case studies in variety of domains for simulation modeling. Prereq: Consent of instructor.


591-92-93 Special Topics in Industrial Engineering (1-3,1-3,1-3) Individual or group research projects. Prereq: Consent of instructor. May be repeated.

594 Cumulating Integrated Project Report (3) (Same as Mechanical Engineering 594).

601 Operations Research Models in Engineering Economy (3) Mathematical programming techniques applied to capital budgeting; advanced topics in multiple attribute decision analysis; Bayesian analysis of sequential decision making; artificial intelligence in complex decision analyses. Prereq: 518, 523.

602 Nonlinear Optimization (3) (Same as Management Science 651.)


691-92-93 Advanced Topics in Industrial Engineering (3,3,3) Forum to study individually or in groups a selected standing and consistent of instructor. May be repeated with consent of instructor.

536 Project Management (3) Development and management of engineering and technology projects. Project proposal preparation; resource and cost estimation; and project planning, organizing, and controlling; network diagrams and other techniques. Role of project manager: team building, conflict resolution, and contract negotiations. Discussion of typical problems and alternatives solutions. Case studies and student projects. Prereq: 537 or consent of instructor.

537 Analytical Methods for Engineering Managers (3) Survey of management analysis and control systems through IE techniques. Qualitative and quantitative systems: methods analysis, work measurement, incentive systems, wage and salary development, production and inventory control, facility layout, linear programming, and other research techniques. Not for credit for students with undergraduate degrees in industrial engineering.

538 New Venture Formation (3) Factors other than mechanical or chemical which enter into successful establishment of manufacturing or service enterprise. Organizational and financial planning and evaluation. Cost and location studies and market analysis to determine commercial feasibility of new ventures. Prereq: 539.

539 Strategic Management in Technical Organizations (3) Strategic planning process and strategic management in practice; corporate vision and mission; product and process, organizational change; strategic planning and management policy; external factors; commercialization of new technology; and competition and beyond. Prereq: 533 and Industrial Engineering 518 or consent of instructor.


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.

Information Sciences

Office of the Provost

DEGREE

Information Sciences ........... M.S.

Elizabeth Aversa, Director

Professors:

Aversa, Elizabeth, Ph.D. ........... Drexel
Tenopir, Carol, Ph.D. .............. Illinois
Wilson, P. (Emeritus), Ph.D. ........ Michigan

Associate Professors:

Fisher, Patricia L., Ph.D. ............ Florida State
The School of Information Sciences provides a program leading to the preparation of librarians and information professionals for work in all types of libraries and information centers. The program of study includes a graduate curriculum leading to the Master of Science degree. The program is accredited by the American Library Association. A Ph.D. degree program may also be pursued with a major in Communications, concentration in information sciences.

The mission of the school is to educate people to live, work, and flourish in an information society through excellence in teaching, research, and public service in information sciences.

The plan for the future of the School of Information Sciences states that “The School of Information Sciences will be recognized nationally and internationally as an interdiscipli-

THE MASTER’S DEGREE

The program leading to the Master of Science involves a total of 42 semester hours of graduate courses including 5 courses 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.

Required Courses
Five courses are required of all students: 490, 520, 530, 560 and 580. (Students seeking licensure see track requirements below.) These courses address the evolving information environment and the representation of information; information access and retrieval; developing and managing collections; and principles and concepts of the information sciences. Three courses, 490, 520 and 530, are prerequisite to all courses for students enrolled in the M.S. degree program.

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 manager/archivist, webpage designer, indexer/abstractor, online information retrieval specialist, medical or law librarian, reference librarian, youth services specialist, and many others. Students are encouraged to take advantage of the individualized curricular approach.

Whichever 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 no 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 5 required courses plus 551, 567, 571, 572, 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 Program Requirements
Thesis Option: Students electing the thesis option will write a master’s thesis under close supervision of a thesis commit-

deel. 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 written examination that is taken by non-theis option 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: 590 Problems in Information Sciences, 591 Supervised Readings in Information Sciences, 592 Seminar in Information Sciences, 593 Independent Study, 594 Graduate Research Participation (S/NC only), 595 Student Teaching in School Library Information Center (S/NC only), 596 Student Teaching and Observation in School Library Information Center (S/NC only), 599 Practicum (S/NC only).

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 subcontract with Oak Ridge National Laboratory and the Department of Energy.

A limited number of graduate teaching assistantships are available through the department. 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, Virginia, or West Virginia.

Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

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.)

485 Introduction to Electronic Communications and Information Resources on the Internet (3) Exploration of worldwide information and communication resources: email, newsgroups, and world wide web. Discussion of information issues: copyright, censorship, privacy and access.

486 Advanced Electronic Communications and Information Resources on the Internet (3) Exploration of advanced information and communications issues, resources and tools: forms, scripting and search engines. Prereq: 485 or consent of instructor.

490 Information Environment (3) Generation, production, organization, functions and use of information. Roles of information in society, information seeking and user behavior, 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 (1-15) 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 repeated. S/NC only. E

520 Organization and Representation of Information (3) Principles of describing, indexing, and indexing intellectual works; current approaches; citation systems, descriptive cataloging, non-subject indexing, pre- and post-coordinate subject indexing, classification and categorization; authority control of index terms; standards. E,A

521 Cataloging and Classification (3) Basic library-oriented cataloging, classification, indexes, tools, and supporting operations. Descriptive cataloging, choice and form of non-subject entries, subject heading, bibliographic control, bibliographic utilities, online library catalogs.

522 Organization and Representation of Multimedia Information Resources (3) Principles and practices of description and access to information resources in non-textual content, choice of visual, auditory, and electronic (including Internet) resources.

523 Abstracting and Indexing (3) Philosophies, standards, and procedures for manual and automatic document indexing; in-book indexing, vocabulary control, thesaurus construction, and abstracting.

530 Information Access and Retrieval (3) Media for information storage, logical and physical information structure, 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 and language. Organization, management of national resources.

534 Government Information Sources (3) Selection, acquisition, organization, and utilization of government information in various forms of legislative, judicial, executive, federal, state, local, and international government and intergovernmental agencies.

535 Advanced Information Retrieval (3) Bibliographic, non-bibliographic, full-text databases, e.g., non-subject access information, structured databases, contents-page/full-text databases, patents; document delivery alternatives, evaluation, and testing.

537 Information Industry (3) Issues and trends concerning information industry; products and services. Standards, enabling technologies, choice of distribution media, entrepreneurial opportunities. Legal, ethical, and quality concerns.

538 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 and exchange of information; review of key national and international policy areas relevant to information creation, production, and distribution; development of information policy for organizations.

540 Research Methods (3) Research methods in variety of information environments: primary and secondary research; research project design; research results interpretation; analysis of published research; techniques supporting research process.

550 Management of Information Organizations (3) Supervisory and management concepts, strategies, and techniques applicable to information professional working in libraries, archives, records management, and other information organizations.

551 School Library Media Centers (3) Planning, implementing, and evaluating school library programs. Current trends in library science, site-based management, relationships with district and state services.

552 Academic Libraries (3) Mission, status, and history of academic libraries and academic librarianship in community colleges and universities. Current trends in higher education, information technology, and government’s impact on public, technical, and administrative services.

553 Corporate Information Services (3) Development and maintenance of information and services. Infor- mation resources external to organization.

554 Public Library Management and Services (3) Development, roles, political environment, governance, organization, fiscal management, services, marketing, and performance evaluations.

555 Scientific and Technical Communications (3) Evolution of scientific and technical communication; current trends; role of formal and informal communication; major STI organizations and their roles.

557 User Instruction (3) Theory, strategy, design, and practice in providing instructional services and technology for end users of information and information systems. Includes practical experience.

560 Development and Management of Collections (3) Selecting and preserving variety of items (tangible and "intangible") for particular users. Community analysis; policies and procedures; evaluation; purchasing.

561 Contemporary Book Publishing (3) Creation, design, production, marketing, and distribution; various types of publishers.

563 Graphic Design and Media (3) Principles and practice in visual aspects of communications. Graphic design, typography, production techniques and publication design, as these apply to electronic information delivery systems.

564 Corporate Information Systems (3) Objectives and function elements of records systems, archival programs, management information systems and techniques within various types of organizations. Management of information internal to organizations.


566 Business Intelligence for Information Professionals (3) Principles and practices of gathering and synthesizing business intelligence: competitive intelligence, environmental scanning, and issues management; information evaluation and synthesis; role of strategic information in modern organizations.

567 Information Network Applications (3) Scholarly and community-based electronic communications. National and international standards, tools, resources; identification, analysis, evaluation, and management of electronic tools and resources; construction of local technologies as developed and applicable.

569 Advanced Production of Audiovisual Software (3) (Same as Education in the Sciences, Mathematics, Research and Technology 569.)


572 Resources for Young Adults (3) Critical survey of books and related materials for young adults, personal, vocational, and recreational needs and interests. Evaluation, selection, and utilization for school and public libraries.

573 Programming for Children (3) Programming and critical survey of books and related materials for children and young adults. Reading, listening, and viewing guidance for individuals and
574 Adult Materials and Services (3) Popular informational and recreational materials and services to meet adult interests in variety of formats. Development of specialized collections.

580 Foundations of Information Sciences and Technologies (3) Definitions of information, information sciences, and information technology; theories of information, information representation, retrieval, and transfer; standards and technologies for information processing and distribution; research front; bibliometrics and infometrics; 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 catalogs, computer-based reference services, acquisition, serials control, systems planning and implementation.

583 Information Systems (3) Systems concept, defining system, analysis and design of information systems. Selecting and using information systems to support various activities. User involvement in the development process. F,Sp

584 Database Management Systems (3) Defining data needs, data structures, role 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 Technologies (3) Evolution, trends, capabilities, and limitations of technologies applied to information capture, storage, preservation, access, and distribution. F,Sp

586 Information Retrieval Systems (3) Historical perspective on information retrieval research; statistical and probabilistic retrieval techniques; cognitive user modeling; expert intermediary systems; associations, relations and hypertext.

588 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


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. F,Sp

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/NC 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/NC only.

596 Field-Based Experience in School Library Information Centers (2) Prescribed activities to gain competencies in a school library information center setting. Must be taken twice. May be repeated. Maximum 6 hrs. S/NC only.

597 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/NC only. E

598 Advanced Seminar in Information Sciences (3) Theories, research, and traditional practices of information representation, organization, and access and retrieval. Research opportunities and methods. Relationship to and interaction with other disciplines.

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### Instructional Technology, Curriculum and Evaluation

**College of Education**

**MAJOR**

**DEGREES**

Education ......................... M.S., Ed.S., Ed.D., Ph.D.

Michael Waugh, Head

Professors:

Counts, Edward L., Ed.D. ............ Texas A&M

Dessart, Donald J., Ph.D. ............. Maryland

Doak, E. Dale (Emeritus), Ed.D. ...... Colorado

French, Russell, Ph.D. ................ Ohio State

Hipple, Theodore W., Ph.D. ............. Illinois

Myer, M. E. (Emeritus), Ed.D. ......... Florida

Roeske, Edward L. (Emeritus), Ed.D. . .... Ohio State

Waugh, Michael, Ed.D. ............... Georgia

Associate Professors:

Connelly, Mary Jane, Ed.D. .......... VPI

Grant, A. D., Ph.D. .................... Wisconsin

O’Bannon, Blanche, Ed.D. .......... Memhis

Assistant Professor:

Norris, Alleen, Ph.D. ................. Virginia

The Department of Instructional Technology, Curriculum, and Evaluation offers graduate programs leading to degrees, majors, and concentrations in:

- *Master of Science*
  - Education
    - Track 1-curriculum
    - Track 1-instructional technology
  - Educational Specialist
  - Doctor of Education
    - Curriculum
    - Instructional technology
  - Doctor of Philosophy
    - Curriculum, educational research, and evaluation
    - Instructional technology

See Education under Fields of Instruction for full description of all degree requirements.

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The mission of department focuses on the preparation of teachers and instructors in curriculum and in the preparation of various other professionals who desire to utilize educational research and instructional technology.

**GRADUATE COURSES**

475 Utilization of Instructional Media (3) Basic concepts of communication and instructional development for improving instruction through use of media. F,Sp

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

502 Registration for Use of Facilities (1-15) 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


518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Techniques of Research in Education (3) Study and application. Sp

521 Computer Applications in Education (3) Use and integration of technology in educational settings to support teaching and learning. Prereq: Basic computer operations or consent of instructor. F

532 Instructional Research: Analysis and Application (3) Analysis of research on instruction. Translation and application of research findings into instructional performance.

535 Program Evaluation in Education (3) Issues and practices in planning and conducting program and curriculum evaluation in variety of settings. Fundamentals of design, measurement, philosophy, ethics, and underlying values; proper role and use of evaluation in educational organizations. Prereq: Consent of instructor. (Same as Higher Education 534.) Sp,Su

541 The High School Curriculum (3) Identification of problems associated with curriculum study. Tennessee curriculum framework, assessment of trends in programs of local, regional, and national significance. F,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 designs, instructional patterns, and organization and structure of junior high and middle school. Sp

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 and use of available assessment data. Methods of assessment other than tests and measurements: portfolios, performance tasks, exhibitions. F

561 Educational Statistics (3) Applications of descriptive and inferential statistics to educational and instructional 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 variety of organizational settings.

569 Media and Technology Production Techniques (3) Workshop strategy: basic photography, audio production, multi and single camera TV production, basic digital video editing, and other media/technology techniques important for improving communication in
570 Instructional Systems Design (3) Application of theory and research of instructional systems design to solve instructional problems in educational settings. F

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. Prereq: 521, 570, or consent of instructor. Sp

573 Introduction to Multimedia in Instruction (3) Selected computer-based multimedia production tools and use to produce instructional materials based on specific learner characteristics and objectives. Prereq: 521 or consent of instructor. Su

575 The Internet: Implications for Teaching and Learning (3) Investigation of Internet, its origin and historical development. Hands-on use of Internet. Relevant issues regarding legal and ethical issues, evaluation, responsible use, proprietary rights. F

576 Advanced Interactive Multimedia for Instruction (3) Design and production of educational and interactive Web sites using advanced software. Development of effective interactive methods for enhancing teaching and learning supported by principles of planning, designing, creating, testing, and evaluating. Prereq: 521, 570, 573, 575. Sp

578 Web Design (3) Design and development of instructional web sites using basic design principles and visual web editor software. Prereq: 575. Sp

580 Techniques for Research in Curriculum and Instruction (3) Fundamentals of research methodology applicable to curriculum, instruction, an other areas of educational inquiry. 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. 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/NP 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 curricular materials. Critical reading of research, methodological development in descriptive and survey areas. Sp

630 Seminar in Assessment and Evaluation (3) Trends and issues in assessment, personnel evaluation, and program evaluation; and examination of current state, regional and national assessment and evaluation projects. Prereq: Consent of instructor. F

631 Application of Assessment/Evaluation (3) Systems designs, instruments, procedures, reporting formats used in personnel and program evaluation and student assessment; analysis, synthesis and interpretation of data sets. Prereq: 630. Sp

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: 581, 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 Assessments (3) Models and methods for assessing performance of educators and other professionals. Critique of systems currently in use and design of evaluation system. F

675 Curriculum Evaluation: Theory and Application (3) Evaluation trends and issues. Theoretical frameworks to design evaluation studies for various educational programs. F

676 Curriculum Theory (3) Influenccurriculum theories and approaches, implications for structure and design of educational programs. Nature and function of theory. Prereq: 588. F

678 Seminar in Instructional Technology (1) Readings and discussions based on current literature, research, theories and practices in instructional technology. Prereq: Consent of instructor. May be repeated. Maximum 3 hrs. F


680 Designing Problem-Based Learning Environments (3) Development and integration of problem-based learning pedagogy into curriculum. Examination of literature to understand theoretical perspective for design of this type of learning environment. Prereq: 521, 570, 573, 575, or consent of instructor. Su

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, 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

421 Comparative Studies in African and African-American Societies (3) Education, religion, and social stratification. Views African-Americans and Africans have of each other and concept of Pan-Africanism. 443 Topics in Black Literature (3) (Same as English 443.)

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.)


483 African-American Women in American Society (3) Historical and contemporary socio-eco-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.

Asian Studies

GRADUATE COURSES

471 Selected Topics in Asian Studies (3) Content varies. May be repeated. Maximum 9 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.)

423 History of Film and Modern Art (3) (Same as Art Media/Photography 433.)

434 Hispanic Culture Through Film (3) (Same as Spanish 434.)

465 Latin American Film and Culture (3) (Same as Spanish 465 and Latin American Studies 465.)

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.

452 Modern Drama, 1880-1945 (3) (Same as English 452.)

454 Twentieth-Century International Novel (3) (Same as English 454.)

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
456 Latin American Government and Politics (3) (Same as Political Science 456.)
465 Latin American Film and Culture (3) (Same as Spanish 465 and Cinema Studies 465.)
479 Disenched Texts in Hispanic Literature (3) (Same as Spanish 479.)
510 Special Topics (3) May be repeated. Maximum 6 hrs.

Legal Studies

GRADUATE COURSES
400 Mass Communications Law and Ethics (3) (Same as Communications 400.)
430 United States Constitutional Law: Sources of Power and Restraint (3) (Same as Political Science 430.)
431 United States Constitutional Law: Civil Rights and Liberties (3) (Same as Political Science 431.)
442 Administrative Law (3) (Same as Political Science 442.)
451 Criminal Justice (3) (Same as Sociology 451.)
455 Society and Law (3) (Same as Sociology 455.)
470 International Law (3) (Same as Political Science 470.)
490 Language and Law (3) (Same as English 490 and Legal Studies 490.)
496 The Rhetoric of Legal Discourse (3) (Same as English 496.)
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 (300-level or above) 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.)
431 Topics in Hispanic Linguistics (3) (Same as Spanish 431.)
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 English 476.)
477 Pedagogical Grammar for ESL Teachers (3) (Same as English 477.)
485 Special Topics in Language (3) (Same as English 485.)
490 Language and Law (3) (Same as English 490 and Legal Studies 490.)
510 Special Topics (3) May be repeated. Maximum 6 hrs.

Medieval Studies

GRADUATE COURSES
510 Special Topics (3) May be repeated. Maximum 6 hrs.

Urban Studies

GRADUATE COURSES
401 The City in the U.S. (3) (Same as Planning 401.)
411 Urban Geography of the United States (3) (Same as Geography 411.)
464 Urban Ecology (3) (Same as Sociology 464.)

Women’s Studies

GRADUATE COURSES
400 Topics in Women’s Studies (3) Content varies. May be repeated.
410 Gender Role Development: Implications for Education and Counseling (3) (Same as Counselor Education and Counseling Psychology 410.)
422 Women Writers in Britain (3) (Same as English 422.)
425 Women’s Health (3) (Same as Health 425.)
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 and 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.

Journalism

GRADUATE COURSES
403 International Communications (3) Development and operations of world mass communications channels and agencies. Comparative analysis of media, media practices, and flow of news throughout world. Print and broadcast systems in terms of relevant social, political, economic, and cultural factors. Relation of communication practices to international affairs and understanding.
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 logic. 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 mass circulation and specialized magazines. Organizing and presenting material, 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: 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: 6 hrs mathematics and/or accounting and senior standing. Sp


433 Advanced Editing (3) Sensitivity to language and editing skills. Headline writing, layout, and production. Prereq: Editing. Sp

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, air pollution, allergens, nuclear power, fossil fuel power, and solid wastes. Presentations from experts and interviews of experts in environmental science and reporting. Exemplary popular literature in environmental reporting. Prereq: 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 scientific 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 quests to understand why some science writing succeeds. Prereq: Consent of instructor.


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.

490 Advanced Photojournalism (3) Advanced principles and methods of black-and-white photography. Introduction to color photography. News and feature photographs and photo essays. Prereq: Photojournalism or consent of instructor. Sp

520 Political Communications (3) Relationships among mass media, public relations and government and their roles in democratic society. Governmental public relations, political campaigns, military, executive, legislative and judicial branches of government, special interest groups and public access to government information. (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.)

535 Publications Management (3) Problems in management, production, market analysis, and design. Techniques of writing, editing, and presenting comprehensive articles and other material; regional and specialized magazines. Individual editorial projects. Prereq: 420 or consent of instructor.

550 Writing and Editing Projects (3) Specialized writing or editing interests: agriculture, politics, labor, finance, science, technical, general publications. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

560 Publishing on World Wide Web (3) Electronic research and publishing. Social, legal and ethical challenges surrounding new media. Project planning and storyboarding techniques for designing and creating site on Web. (Same as Public Relations 560.)

580 Seminar in Visual Communication (3) Behavioral aspects of communication with images. Theories of psychological effect in color, shape, texture, and design. Research project on perceiving Creative Strategy or Electronic Field Production or equivalent.

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

598 Internship (3) Professional work in journalism supervised by editor or manager with faculty approval. No retroactive credit for previous work experience. Prereq: Completion of core curriculum.

Public Relations

GRADUATE COURSES

412 Opinion Writing (3) (Same as Journalism 412.)

416 Issues in Public Relations (3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

470 Public Relations Campaigns (3) Research, planning and communication and evaluation of major public relations campaigns. Oral and written presenta- tion of one relations project from inception to completion. Extensive out-of-class work. Prereq: 320 Public Relations Communications and 370 Public Relations Cases or consent of instructor. F-Sp

516 Seminar in Public Relations Issues (3) Topics vary. May be repeated. Maximum 6 hrs.

520 Political Communications (3) (Same as Journalism 520.)

525 Public Opinion (3) (Same as Journalism 525.)

530 Fund Raising and Proposal Writing (3) History, philosophy and practice of philanthropy in U.S. Sources of funds from foundations, corporations and public agencies. Research and preparation of fund-raising proposals. Sp

560 Publishing on World Wide Web (3) (Same as Journalism 560.)

571 Public Relations Management (3) Analysis and problems of management in communication between institutions and organizations and their publics. Measurement and evaluation of effectiveness of communica- tion programs. Prereq: 470 or consent of instructor.

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

598 Internship (3) Professional work in public relations supervised by communications manager with faculty approval. No retroactive credit for previous work experience. Prereq: Completion of core curriculum.

Large Animal Clinical Sciences

See College of Veterinary Medicine and Comparative and Experimental Medicine

Law

(College of Law)

MAJOR DEGREES

LAW ............ J.D., J.D.-MBA, J.D.-M.P.A.

Thomas C. Galligan, Jr., Dean


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 for 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).

*DThis course is not required for students who have an undergraduate major in accounting, finance, or business administration, who hold the MBA degree, or who are enrolled in the dual J.D.-MBA program. Waivers may also be granted to students who have acquired the requisite business knowledge through other coursework or through practical experience.

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
- 902 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 program leading to the conferral of both the Doctor of Business Administration and the Master of Business Administration. The dual program saves the student approximately 15 hours (one semester) over the time that would be required to earn both degrees independently.

The establishment of the dual program recognizes the increasing complexity 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 Office of Graduate Admissions and College of Business Administration for the MBA degree, and by the Dual Program Committee.

Students who have been accepted by both colleges may 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 are started prior to entry into the last 28 semester hours of J.D. coursework and prior to the third semester 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. degree for acceptable performance in approved graduate-level courses offered by the College of Business Administration. The College of Business Administration will award up to 6 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 may 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 in the J.D. program, students register through the College of Law. During the first year in the MBA program, students register as graduate students. After the first two years, any term in which students take law coursework or a mixture of law and graduate courses, they are classified and registered as law students. If taking only graduate courses, they are classified and registered as graduate students.

Approved Dual Credit

MBA courses in which the student has earned a B grade or higher and are to be counted toward the J.D. program must include the requisite business knowledge through other coursework or through practical experience. Waivers may also be granted to students who have acquired the requisite business knowledge through other coursework or through practical experience.

The establishment of the dual program recognizes the increasing complexity 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.

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 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 and the Office of Graduate Admissions for the M.P.A. 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 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 29 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 the 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 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). 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. 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 grade only. If a C or above is earned in a law course, an S will be recorded on the transcript. If a student earns a grade below a C, an NC will be recorded, and the course cannot be used toward degree requirements. Grades for law courses will not be reflected in the cumulative average. Law courses may be taken for credit only by students enrolled in a graduate degree program.

Different rules apply to the student enrolled in the Dual J.D.-MBA or J.D.-M.P.A. Programs. Grades must be earned according to the grading system of the respective college, e.g. numerical grades for law courses, letter grades for graduate courses. Refer to section on Grades for the grading scale acceptable toward meeting degree requirements. Cumulative GPA for law courses only will be carried until graduation, at which time both the graduate and the law cumulative GPAs will be shown on the permanent record.

PROFESSIONAL COURSES

801 Civil Procedure I (3) Binding effect of judgments, selecting proper court (jurisdiction and venue), ascertaining applicable law, and federal and state practice.


803 Contracts I (3) Basic agreement process and legal protections afforded contracts: offer and acceptance, consideration, mutual assent, unconscionability, the Statute of Frauds, unconscionability and other controls of promissory liability. Introduction to relevant portions of Article 2 of the Uniform Commercial Code.

804 Contracts II (3) Continuation of Contracts I. Issues arising after contract formation: interpretation, duty of good faith; conditions; impropriability and frustration of purpose; remedies; third party beneficiaries; assignment and delegation. Considerable coverage of Article 2 of the Uniform Commercial Code with respect to remedies, anticipatory repudiation, impracticability and good faith.

805 Legal Process I (3) Lawyer-like use of cases and statutes in prediction and persuasion. Analysis and synthesis of common law decisions; statutory interpretation; fundamentals of expository legal writing and legal research.

806 Legal Process II (3) Continuation of Legal Process I. Formal legal writing, appellate procedure, and oral advocacy.

807 Torts I (3) Intentional torts, defenses and privileges related to intentional torts; negligence: standard of care, duty of care, proximate cause; assumption of risk; negligeence of owners and occupants of land; defenses based on plaintiff’s conduct: contributory and comparative negligence, assumption of risk, failure to take precautions, and knowledge and notice. Vicarious and several liability.

808 Torts II (3) Vicarious liability and related concepts; strict liability for dangerous animals and abnormally dangerous activities; products liability; nuisance, defamation and invasion of privacy; economic torts: misrepresentation and interference with contract and prospective opportunities; immunity: those of government, governmental employees, charities and family members, and damages.

809 Criminal Law (3) Substantive aspects of criminal law: general principles applicable to all criminal conduct; specific analysis of particular crimes; defenses to crimes.

810 Property (4) Introductory course treating issues of ownership, possession, and title in the areas of: landlord-tenant relations; estates in land and future interests; co-ownership and marital property; real estate sales agreements and conveyances; title assurance and recording statutes; servitudes; and selected aspects of nuisance law, eminent domain and zoning.

812 Constitutional Law (4) Fundamental principles of American constitutional law: federalism, separation of powers, equal protection of law, and constitutional protection of other fundamental individual rights.

813 Evidence (4) Rules regulating introduction and exclusion of oral, written and demonstrative evidence at trials and other proceedings, including relevance, competence, impeachment, hearsay, privilege, expert testimony, authentication, and judicial notice. Coreq: 920 for students electing concentration in advocacy.

814 Legal Profession (3) Legal, professional and ethical standards applicable to lawyers. Not open to students who have taken 815.

815 Introduction to Advocacy and Professional Responsibility (3) Theory and morality of advocacy in adversarial system, and legal, ethical, and professional standards applicable to lawyers and especially lawyers as advocates.

818 Fundamental Concepts of Income Taxation (3) Introduction to basic statutory analysis, fundamental principles of federal individual income tax, and perversive income and other income taxes. Federal concept of gross income, pattern of exclusions, exemptions and deductions from gross income used to arrive at taxable base; special treatment of capital gains and losses; and rate structure.


821 Administrative Law (3) Administrative agency decision-making processes and judicial review of administrative agencies, procedural standards for informal and formal administrative adjudication and rule-making (attention to Federal Administrative Procedure Act, various administrative standards in administrative settings; and availability, scope and timing of judicial review of agency actions.

822 Legislation (3) Interpretation and drafting of statutes, legislative process, and legislative power; comparison of judicial views on legislative process with both realities of legislative process and applicable constitutional principles.


826 Business Associations (4) Legal problems associated with capital formation, operation, and dissolution of unincorporated and incorporated business firms; legal rights of duty of firm members: principals and agents, partners and limited partners, managers, owners and governors of limited liability companies, and corporate shareholders, directors, and officers; and others with whom members interact in connection with firm’s business affairs.

827 Corporate Finance (3) Legal issues arising in conjunction with corporate financial transactions: issuance of debt and various types of equity securities, distributions to shareholders, mergers and other corporate acquisitions, legal valuation of corporate securities.

830 Securities Regulation (3) Basic structure of federal securities law. Legal problems associated with raising of capital by new and growing enterprises; securities transactions by promoters, officers, directors and others; regulation of public-held companies; litigation under Rule 10b-5 and other antifraud provisions; and provision of legal and other professional services in connection with securities transactions. Recommended prereq or coreq: 827.

833 Representing Enterprises (3-5) Capstone course for concentration in business transactions. Simulated business transactions and completion of major planning and drafting project. Transactions vary: formation of new business, acquisition of existing business, development of real estate, and real estate financing transactions and corporate reorganization. Prereq: Completion of all courses for concentration in business transactions.

834 Antitrust (3) Federal antitrust laws; monopolization, predatory pricing, and anticompetitive practices generally; government enforcement techniques and private treble damage suits.

840 Commercial Law (4) Basic coverage of most significant provisions of Uniform Commercial Code.
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 practice of medicine; medical education; licensing and specialization; hospital staff privileges; medical malpractice liability; standards of care; professional causation, defenses, and damages; protection of patient autonomy; consent, informed consent, conception and abortion, choice of treatment, and death and dying; control of communicable diseases; organ transplantation and medical resource allocation.


973 Wealth Transfer Taxation (3) Taxation of gratuitous transfers of wealth during life (gift tax) and at death (estate tax) and of generation skipping transfers. Prereq or coreq: 835.

975 Tax Theory (3) Method and purposes of government revenue collection through examination of economic and political theory; comparative analysis of various actual and proposed patterns of taxation: income tax, consumption tax, sales tax, value-added tax. Required preparation of expository essay on aspect of tax theory chosen by student. Limited enrollment.

978 Transactional Tax Planning (3) Advanced study of taxation of organizations; tax treatment of business acquisitions, tax planning for financially troubled entities, and review of recent transactions involving cutting-edge tax planning and shaping changes in law. Limited enrollment. Prereq: 818 and 972.

980 Insurance (3) Types of insurance: life, property, health, accident and liability insurance; regulation of insurance industry; interpretation of insurance contracts; irrevocable interest requirement; conditions, warranties and representations; coverage and exclusions; duties of agents; excess liability; subrogation; and bad faith actions against insurers. Liability insurance defenses: 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 contractual limitations on recovery; damages; causation; and defenses.

985 Workers' Compensation (3) Workers' Compensation system for compensating victims of work-related accidents and diseases; requirements for coverage; coverage related to claims for personal injuries or occupational diseases arising out of and in course of employment; causation; nature of medical disability; disfigurement; death; exclusiveness of compensation remedy against employer and co-employees; and rights and liabilities of non-employers; administrative and procedural aspects of Workers' Compensation plan; and statutory law reform measures.

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 the Dean or the Dean's designee. Maximum of one 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 the Dean or the Dean's designee. Maximum of one each semester during last three semesters of study.

996 Law Review (1) Performance of duties as staff member or editor of Tennessee Law Review. Responsibility is specified in Tennessee Law Review Policy Manual; writing of casenote, comment or article, and/or performance of other assigned editorial labor. Students in the Tennessee Law Review. Completion of potentially publishable comment or article for Tennessee Law Review satisfies expository writing 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 classes when such planning and drafting option is provided by course instructor. May be repeated.

Life Sciences (College of Arts and Sciences)

MAJOR DEGREES

Life Sciences ........................................ M.S., Ph.D.

Jeffrey Becker, 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 and animal 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 School of 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 developments in the biological and computational sciences relating 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 mammalian genomics, structural biology, proteomics, computational biology and bioinformatics, and bioanalytical technologies. Scientists from both campuses participate in a graduate program designed for the M.S. or Ph.D. degrees are mentored jointly by a faculty member from each campus. A year-long introductory course in Genome Science and Technology focuses on inquiry conducted on a genome-wide scale. Laboratory rotations during the first year offer students hands-on experience in a variety of focus areas. Applicants are expected to have a background in the biological, physical or computational sciences. Requirements for admission are one year of general biology or the equivalent; two years of chemistry, including one year of general chemistry and one year of introductory organic chemistry with laboratory; one year of calculus; one year of physics; at least eight semester hours in cognate science; the program; a combined GRE score of 1800 for the verbal, quantitative, and analytical sections is highly desirable; three letters of recommendation; and a minimum grade point average of 3.0 out of 4.0. Coursework in genetics, cell biology, molecular biology and biochemistry is advantageous. Superior students, deficient in one or more of the above requirements, may be admitted at the discretion of the program admissions committee. Deficiencies will be made up as a part of the courses taken by the individual student.

Requirements for the Ph.D. degree are satisfactory completion of the genome science and technology core courses, (Life Sciences 505, 515-16, 520-21, 540-41; Biochemistry and Cellular and Molecular Biology 411 and 412; and members of GST laboratory, satisfactory completion of formal advanced courses in the areas of the student’s interest, passing both written and oral comprehensive examinations, a dissertation reporting the results of original and significant scientific research (a minimum of 24 semester hours of course 600 is required), a final oral/written examination on the dissertation, and a formal seminar presentation of the dissertation research. Participation in at least one seminar during each semester of residence after the first year is strongly recommended. 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.

Plant Physiology and Genetics

This program provides the opportunity for intensive training and research experience in areas transcending the usual boundaries of botany, biochemistry, and agricultural plant sciences. Solutions of problems concerning the interactions of physiology and genetics in applied and fundamental aspects of plant sciences are the focal points. Admission requirements are a Bachelor’s degree with a major in a biological, behavioral, 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 Sciences and Landscape Systems 471 or Ecology and Evolutionary Biology 560; 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 6 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 (1-15) 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 Graduate Research Participation (3-12) Special advanced research project not related to dissertation research. Topics chosen with consent of instructor. May be repeated. Maximum 3 hrs.

505 Research Rotation (2) Laboratory rotations with faculty member on clearly defined projects. Written proposal and oral report. May be repeated. Maximum 6 hrs.

506 Computational Biology and Genome Informatics (3) Computational basis of nucleotide and protein sequence analysis; pairwise sequence comparison; multiple sequence alignments; gene and species 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.

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) 515—Introduction to research in genome science & technology concentration. 516—Scientific principles, computational biology and bioinformatics. 521—Genetic variation, inheritance, phenotypic traits, molecular genetics and genomics, mutagenesis in laboratory rodents and other mammals. Prereq: Bioinformatics 201.

520-21 Genome Science and Technology I, II (4,4) 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 and Genomics (3) Genetic variation, inheritance, phenotypic traits, molecular genetics and genomics, mutagenesis in laboratory rodents and other mammals. Prereq: 520-21.

571 International Management (3) Preparation of management of ventures formed both within larger corporations and independently. Preparation of a venture plan, case analysis.

581 Environmental Management (3) Analysis of methods and models for understanding internal and external factors on managerial decisions. Modelling real-world systems through problem definition, supporting data structure design, model design, solution, implementation, and maintenance.

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/NC or letter grade.

595 Selected Topics in Current Management Issues (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

610 Advanced Topics in Life Sciences (1-3) Topics vary. May be repeated. Maximum 6 hrs.

655-96 Advanced Topics in Genome Science and Technology (1-3) Tutorials or lectures on variety of advanced topics to be chosen by instructor. May be repeated. Maximum 4 hrs.

Logistics

See Marketing, Logistics and Transportation

Management

(College of Business Administration)

MAJOR DEGREES

Business Administration MBA, Ph.D.

Oscar Fowler, Head

Professors:

Boling, Ronald W. (Emeritus), Ph.D. ... Stanford
Dewhurst, H. Dudley (Emeritus), Ph.D. ... Texas
Gilbert, Kenneth C., Ph.D. .......... Tennessee
James, Lawrence R. (Pilot Chair of Excellence), Ph.D. .......... Utah
Judge, William Q., Ph.D. .......... North Carolina
Keally, A. H. (Emeritus), MBA, Penn Pennsylvania
Ladd, Robert T., Ph.D. .......... Georgia
Larsen, John M., Jr. (Emeritus), Ph.D. ... Purdue
Miller, Alex (W. B. Stokely Prof.), Ph.D. .......... Washington
Noel, C. Warren, Ph.D. .......... Alabama
 Noon, Charles E., Ph.D. .......... Michigan
Rentsch, J. R., Ph.D. .......... Maryland
Rush, Michael C., Ph.D. .......... Akron
Srinivasan, M. M., Ph.D. .......... Northwestern
Stahl, Michael J., Ph.D. .......... Rensselaer
Vance, S. C. (Emeritus) (W. B. Stokely Prof.), Ph.D. .......... Pennsylvania
Whitlock, G. H. (Emeritus) (Distinguished Prof.), Ph.D. .......... Tennessee
Woehr, D. J., Ph.D. .......... Georgia

Associate Professors:

Bowers, Melissa R., Ph.D. .......... Clemson
Edirisinghe, Chanaka P., Ph.D. .......... British Columbia
Elenkov, Detelin S., Ph.D. .......... MT
Fowler, Oscar S., Ph.D. .......... Georgia
Haley, Usha C. V., Ph.D. .......... New York

Smith, Anne D., Ph.D. .......... North Carolina

BUSINESS ADMINISTRATION CONCENTRATIONS

For complete listing of MBA and Ph.D. program requirements, see Business Administration.

MBA Concentration: Operations Management

Minimum course requirements: 540, 541, and one course from the following: Management Science 526, 551, Statistics 566, Industrial Engineering 522, 526, or an applicable course approved by designated faculty.

PH.D. Concentration: Management

Minimum course requirements are: For operations management -- 541 and 542; two semesters of 640 (may be repeated for credit); one additional semester of approved doctoral seminar work. For strategic management -- 610, 611, 612, 613.

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 (1-15) 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 Organizational Theory: Integrated Structure and Behavior (3) Case, group projects, discussion; organizational theories, organizational effectiveness; contextual factors of organizations: environment, size, technology, organizational structure configurations; organization design; social influences on organization effectiveness; motivation, leadership, group behavior, intergroup relations, organization change and development.

521 Human Resource Management (3) Personnel functions and human resources 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.

540 Logistics and Operations Management (3) Analysis of methods and models for understanding internal and external factors on managerial decisions. Modeling real-world systems through problem definition, supporting data structure design, model design, solution, implementation, and maintenance.

551 Management of New Ventures (3) Integration 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 performances. 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/NC or letter grade.

595 Selected Topics in Current Management Issues (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 research issue: 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
Management Science

(College of Business Administration)

**MAJORS DEGREES**

<table>
<thead>
<tr>
<th>Management Science</th>
<th>M.S., Ph.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenneth C. Gilbert</td>
<td>Chairperson</td>
</tr>
</tbody>
</table>

**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
- Srinivasan, Mandyam M., Management

**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**

<table>
<thead>
<tr>
<th>Core Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Management Science</td>
<td>531, 532, 533, 534, and 691 or 692</td>
</tr>
<tr>
<td>Statistics</td>
<td>563</td>
</tr>
</tbody>
</table>

**Applied specialization area (approved by advisor)**

| Technical elective: | 6 |
| Statistics (500 level or above as approved by advisor) | 9 |

**Electives**

- Mathematics (400 level or above as approved by advisor)
- Industrial Engineering (400 level or above as approved by advisor)
- Other elective (as approved by advisor)

Electives selected from mathematics, statistics, computer science, business, management science, industrial engineering, or other approved area

| 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 Council’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.

**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, each of 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
Marketing, Logistics and Transportation (College of Business Administration)

MAJOR

Degree Programs

Business Administration .......... MBA, Ph.D.

MAJOR DEGREES

(Ph.D. Concentration: Transportation, Marketing, Logistics and
selected from current literature. S/NC only.

691-92 Management Science Seminar (1, 1)

of instructor. May be repeated. Maximum 9 hrs.

631 Integer Programming (3)

Prereq: 531 or equivalent.

534 Management Science Methods in Business (3)

Application of methods from 531, 532, and 533 to real
world problems in business/industry.

551 Leveraging Information Through Descriptive
and Prescriptive Modeling (3)

Concepts and tools for emulating business operations (descriptive modeling)
and for determining optimal operational or tactical strategies (prescriptive modeling).
Visualization, optimization, and simulation concepts reinforced through hands-on
experience with technologies: geographic information systems (GIS), spreadsheet-based
models, simulation packages, and supply chain optimization software. (Same as Information Management 522.)

593 Management Science Problems (1-6)

Directed research and study. Topic areas in logistics and transportation. Topic
announced prior to offering. Prereq: Consent of instructor. May be repeated.

600 Doctoral Research and Dissertation (3-15)

NP only.

611 Seminar in Theoretical Foundations (3)

(Also as Marketing 611.)

612 Research Methods I (3)

(Also as Marketing 612.)

614 Seminar in Evolution of Logistics Thought (3)

Survey of concepts, frameworks, theory, research issues, and empirical research in content areas related to logistics and supply chain management. Conceptual foundations, issue controversies, and future
directions.

615 Seminar in Logistics and Transportation Models (3)

Analysis of contemporary models and methodologies in logistics and transportation research, topical
coverage at discretion of instructor.

693 Independent Study (1-6)

Directed research on subject of mutual interest to student and faculty. May be repeated.
Prereq: Consent of instructor.

Marketing

GRADUATE COURSES

502 Registration for Use of Facilities (1-15)

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.

510 Principles of Marketing Management for Non-
MBA Students (3)

For students from other disciplines interested in obtaining knowledge of marketing discipline
at graduate level.

520 Marketing and Customer Value (3)

Frameworks, techniques, and processes required for customer relationship management and demand
forecasting, market segmentation, services marketing, cross-functional teams that enable firms
to design and maintain competitive marketing and supply chain networks across multiple geographic
locations. Prereq: 510 and Business Administration 511, 512, 513, and 514.

530 MBA Marketing Concentration (6)

Product management: Complex, interdisciplinary nature of product development and product management. Strategic
issues during product life cycle, from idea conception to product development to commercialization to eventual
product dismissal. Integrated communications: Strategies and tactics associated with communicating value
to customers. One-to-one marketing approaches, role of personal selling in communication mix, and
advertising and promotions management. Global marketing management: Cross-national forces that enable firms
to design and maintain competitive marketing and supply chain networks across multiple geographic
locations. Prereq: 520 and Business Administration 511, 512, 513, and 514.

546 Logistics and Supply Chain Strategy (3)

Development of strategy for logistics systems and supply chain processes. Executive-level integration of logistics
strategy with marketing, production, finance, and other decision areas. Prereq: 510 and Business Administration 511, 512, 513, and 514.

547 Global Logistics and Supply Chain Management (3)

Logistics strategy in global firm: materials management, international sourcing and procurement,
global production and distribution, import/export activity, design and operation of supply chains in
global environment. Prereq: 510 and Business Administration 511, 512, 513, and 514.
Graduate programs are offered leading to the
degrees of Master of Science and Doctor of
Philosophy in Materials Science and
Engineering or Polymer Engineering. Both the
Materials Science and Engineering and
Polymer Engineering programs are flexible
and interdisciplinary in nature. Students may
be admitted from a wide range of disciplines;
these include physics, chemistry, chemical
engineering, mechanical engineering,
electrical engineering, materials engineering,
and engineering science programs.

Areas of concentration within the
Materials Science and Engineering degree
program include metallurgy, polymers, and
materials. Specializations include, but are not
limited to: ceramics; composites; electronic
materials; physical/materials processing;
welding metallurgy and materials
joining; corrosion science and engineering;
biomedical materials; and mechanical
and physical behaviors of materials.

Areas of concentration within the Polymer
Engineering degree program include
either materials science and engineering;
processing; polymer morphol-
y; 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 Materials
Science and Engineering or Polymer
Engineering. Additional requirements include:
1. A major consisting of 12 semester
hours of graduate courses in materials
science and engineering or polymer
engineering. The materials science and
engineering major must include 511, 512,
515, and 516 for the metallurgy concentra-
tion; 511, 512, 540, and 541 for the polymers
concentration; and 511, 512, and two
graduate specialization courses approved by
the student’s faculty committee for the
materials concentration. The polymer
engineering major must include 540, 541,
543, 546, 549, and 550 unless similar material
has been covered in prior coursework.
2. Additional courses up to 12 hours total
in related areas.
hours.
4. Satisfactory performance on a
comprehensive oral examination administered
by the faculty committee.

All resident students are required to
register for and participate in the graduate
seminar in materials science and engineering
or polymer engineering, as appropriate,
during each semester in which it is offered.
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 taught in the
department.

The materials science and engineering major and the polymer engineering major must include the courses required for the master’s program.

b. For students having a master’s
degree in Materials Science and Engineering,
Polymer Engineering, or Metallurgical
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, metallurgi-
cal 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)
421 Mechanical Behavior of Materials II (3)

429 Introduction to Ceramic Matrix Composites (3) Characteristics of composites: ceramic matrix composites; macromechanics and materials design; overview of fabrication techniques; microstructural characterization; physical and mechanical property evaluation; current and potential applications. Prereq: Introduction to Materials Science and Engineering and Mechanics of Materials or equivalent and consent of instructor.

443 Polymer Processing (3) Rheological measurements; flow through tubes and slits, end effects and extrude swell; selected application, screw extrusion, injection molding; synthetic fibers, spinning methods, structure development, properties.

444 Plastics Fabrication and Design (3) Lectures, laboratories, and field trips; unit operations of plastics fabrication; plastics classification; design and selection criteria; processing techniques; characterization laboratory. Sp


472 Fundamental Principles of Composite Materials (3) Establishment of physical principles basic to design, manufacturing, and application of fiber reinforced polymers, metals and ceramics. Prereq: 302 or equivalent.

474 Biomaterials (3) Metals, polymers and ceramics used in orthopaedic, cardiovascular, and dental surgical implant and medical device applications. Prereq: 303.

484 Introduction to Manufacturing Engineering (3) (Same as Nuclear Engineering 484, Chemical Engineering 484, Industrial Engineering 484, and Mechanical Engineering 484.)

500 Thesis (1-15) Pro

502 Registration for Use of Facilities (1-15) Required for use of the departmental facilities. May be used only in the same semester when a 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 Graduate Seminar in Materials Science and Engineering (1) Prereq: Admission to graduate program. May be repeated. S/NC only. E

504 Graduate Seminar in Polymer Engineering (1) Prereq: Admission to graduate program. May be repeated. S/NC only. E

505 Engineering Analysis (3) (Same as Chemical Engineering 505.)

507 Application of Linear Algebra in Engineering Systems (3) (Same as Chemical Engineering 507, Electrical and Computer Engineering 507, and Mechanical Engineering 507.)

511 Fundamentals of Materials Science and Engineering I (3) Physical properties: electrical and thermal conductivity, elementary quantum physics, band theory, dielectric materials, magnetic and optical properties. Mechanical behavior: stress and strain at a point, elastic constitutive equations, phenomenological bulk behavior, and deformation mechanisms.

512 Fundamentals of Materials Science and Engineering II (3) Physical properties: electrical and thermal conductivity, elementary quantum physics, band theory, dielectric materials, magnetic and optical properties. Mechanical behavior: stress and strain at a point, elastic constitutive equations, phenomenological bulk behavior, and deformation mechanisms.


522 Defects in Crystals (3) Analytical and experimental analysis of defect interactions in solids. Prereq: 421 or consent of instructor.

523 Plastic Deformation of Metals (3) Geometry and mechanics of plastic deformation; slip, twinning, and cleavage, work hardening, effect of temperature, loading rate effects; effect of ordering and solid solution alloying; polycrystalline behavior in terms of single crystal deformation mechanisms; texture formation. Prereq: 301, 320 or consent of instructor.

524 Metallurgical Thermodynamics (3) Applications of chemical thermodynamics to metallurgical problems: refining, oxidation, surface treatments, alloy systems. Prereq: 570 or equivalent.

525-26 Welding Metallurgy (3,3) Welding processes; physical metallurgy of welding; phase transformations; heat flow; residual stresses; theories of hot cracking; void cracking and porosity formation; applications to process utilization.

528 Ceramic Matrix Composites: Material and Mechanics (3) (Same as Engineering Science 528.)

531 Advanced Corrosion (3) Analyses of corrosion processes in terms of polarization measurements and Pourbaix diagram. Influence of environmental and mechanical factors contributing to pitting, crevice, fretting, wear, fatigue and stress corrosion. Prereq: 470 or consent of instructor.


540 Basic Polymer Chemistry (3) Synthesis, reactions and degradation of polymers. Molecular characterization and solution properties from theory to experiment. Prereq: Semester of organic chemistry and thermodynamics or equivalent.

541 Polymer Rheology (3) Deformation and flow of polymeric materials. Development of empirical models linear viscoelasticity and strain rate equations; molecular functions, temperature dependence and rheometry with applications to synthesis and processing. Elementary kinetic theory of elastic deformation; flow in the linear region; Chemical Equilibrium Fluids. Prereq: 240 Fluid Flow and Heat Transfer or equivalent. (Same as Chemical Engineering 541.)

542 Further Topics in Polymer Processing (3) Description and analysis of selected polymer processing operations. Prereq: 541.


544 Polymer Solution Thermodynamics and Characterization (3) Theories of solutions, statistical thermodynamics. Characterization, treatment of chromatography, viscosity, light scattering and osmotic pressure. Prereq: Undergraduate physical chemistry.

546 Mechanical Properties of Solid Polymers (3) Types of mechanical behavior; Hookian and rubbery elasticity; plastic deformation; fracture; linear viscoelasticity; dynamic mechanical behavior and testing; relaxation; transport and diffusion; introduction to mechanical properties of polymeric composites.

549-50 Laboratory Methods in Polymer Engineering (1,2) Basic experimental techniques and instrumentation associated with characterization, x-ray and light scattering, calorimetry, rheometry, mechanical properties of solid polymers, polymer processing operations. Coreq: 540 or consent of instructor. 549-S/NC only.

560 Principles of Ceramic Processing (3) Treatment of ceramic processing: raw materials preparation and characterization; powder consolidation; drying, firing, sintering, techniques, mechanisms and kinetics. Prereq: 360 or equivalent.

571 Electron Microscopy (3) Operation of electron microscope; kinematical and dynamical diffraction theories; structure determination; analysis of lattice defects. Prereq: 405 or equivalent.

572 X-Ray Diffraction (3) Symmetry of crystals, space group theory, reciprocal lattice and application to determination of structures; powder and single crystal x-ray techniques; introduction to crystal structure determination; computational techniques for dealing with inorganic, metallic and polymer structures.

576 Special Topics in Materials Science and Engineering (3) Topics of current significance and interest. Prereq: Consent of instructor. May be repeated.


600 Doctoral Research and Dissertation (3-15) Pr

612-622 Theoretical Metallurgy (3-3) Topics in solid state physics as applied to metallurgy: introduction to quantum theory, specific heats, electron theory of solids, electrical and thermal conductivity, magnetic properties, theories of alloy formation. Prereq: Consent of instructor.

623 Solidification and Crystal Growth (3) Theories of solidification, fluid flow effects, magnetohydrodynamics of incompressible fluids, growth stability, thermodynamics, applications, rapid solidification, metastability. Prereq: Consent of instructor.

625 Materials Lifetime Science and Engineering I (3) Fundamentals of aqueous and high-temperature corrosion and fatigue; methods of materials lifetime modeling. Prereq: 531 and 532, or consent of instructor.

626 Materials Lifetime Science and Engineering II (3) Interactions between corrosion and fatigue at ambient and high temperatures; lifetime modeling of materials simultaneously subjected to corrosion and fatigue. Prereq: 625.

627 Case Studies in Materials Lifetime Science and Engineering (3) Studies of, and participation in, industrial analyses of lifetimes of structural materials subjected to aqueous-corrosion/fatigue and high-temperature-oxidation/fatigue, performed as part of the student's industrial and national-laboratory internship programs. Prereq: 531 and 532, or consent of instructor.

628 Graduate Seminar in Materials Lifetime Science and Engineering (1) Seminars by students, faculty, and visiting scholars on materials lifetime science and engineering; processes, mechanisms, and materials lifetime modeling. Prereq: 531 and 532, or consent of instructor. S/NC only.

641 Advanced Rheology and Viscoelastic Theory (3) Continuum mechanics, formulation of viscoelastic theories for describing deformation and flow of polymeric materials. Application to polymer processing problems. Recommended for MS candidates working in polymer processing. Prereq: 541.

642 Advanced Topics in Polymer Processing (3) Application of theories of rheological behavior and of structure development to analysis of polymer processing operations. Prereq: 541. (Same as Chemical Engineering 505.)

643 Phase Transformations in Polymers (3) Glass transition and glassy state; annealing of polymeric glasses; crystallization of polymers; nucleation, growth and morphology; secondary nucleation theory; solidification of copolymers; crystallization under stress. Prereq: 543.

671 Quantitative Microscopy (3) Principal acoustic, optical, x-ray, electron and field-ion techniques for examination of microstructures of materials. Prereq: 405.
676 Advanced Topics in Materials Science and Engineering (3) Latest developments and/or advanced special topics. Prereq: Consent of instructor. May be repeated.

678 Seminar in Recent Advances in Materials Science and Engineering (3) Directed and independent study of advanced topics. Prereq: Consent of instructor. May be repeated.

Mathematics
(College of Arts and Sciences)

MAJOR DEGREES
Mathematics .......................... M.M., M.S., Ph.D.

John B. Conway, Head

Professors:
Alexiades, V., Ph.D. .................... Delaware
Anderson, D., F., Ph.D. ............... Chicago
Bradley, John S. (Emeritus), Ph.D. .... Iowa
Carruth, J. H. (Emeritus), Ph.D. ........ Louisiana State
Daverman, Robert J., Ph.D. .......... Wisconsin
Dobbs, D. E., Ph.D. .................... Cornell
Dyak, J., Ph.D. .......................... Warsaw
Frandsen, Henry (Emeritus), Ph.D. .... Illinois
Gross, L. J., Ph.D. ........................ Cornell
Hinton, D. B., Ph.D. ................... Tennessee
Husch, L. S. (Emeritus), Ph.D. ....... Florida State
Johannson, K., Ph.D. ................. Bielefeld
Jordan, G. Samuel, Ph.D. .......... Wisconsin
Karakashian, O., Ph.D. ............. Harvard
Kupershmidt, B. A. (UTSI), Ph.D. .... Maryland
Lenhart, S., Ph.D. ........................ Kentucky
McConnel, R. M. (Emeritus), Ph.D. ... Duke
Mathew, H. T. (Emeritus), Ph.D. ...... Tulane
Miller, D. E. (Emeritus), Ph.D. .......... Michigan
Mulay, S., Ph.D. .......................... Purdue
Plaut, Conrad, Ph.D. .................. Maryland
Rajput, B. S., Ph.D. .................... Illinois
Reddy, K. C. (UTSI), Ph.D. .......... Indian IT
Richter, Stefan, Ph.D. ................. Michigan
Rosinski, J., Ph.D. ........................ Wroclaw
Schaerf, T. W., Ph.D. ................. Maryland
Serbin, Steve (Emeritus), Ph.D. ... Cornell
Simpson, H., Ph.D. ..................... Cal Tech
Soni, K. (Emeritus), Ph.D. .......... Oregon State
Soni, R. Ph., Ph.D. ................ Oregon State
Stallman, F. W. (Emeritus), Ph.D. .... Giessen
Stephenson, K. R., Ph.D. .............. Wisconsin
Sundberg, C., Ph.D. .................... Washington (Maryland)
Thistletwaite, M. B., Ph.D. .......... Manchester
Wade, W. R., Ph.D. ................... California (Riverside)
Wagner, C. G., Ph.D. ................. Duke

Associate Professors:
Collins, Charles R., Ph.D. ............... Minnesota
Feng, Xiaobing, Ph.D. ................. Purdue
Freire, A., Ph.D. ........................ Princeton
Gavrillets, Sergey, Ph.D. .............. Moscow State
Guin, Bo, Ph.D. ........................ Massachusetts
Kimble, K. R. (UTSI), Ph.D. .......... Ohio State
Kuo, Y., Ph.D. ............................ Cincinnati
Xiong, Jie, Ph.D. ......................... North Carolina

Assistant Professors:
Chen, Xia, Ph.D. ........................ Case Western
Davis, Reid, Ph.D. ........................ Tennessee
Denzler, Jochen, Ph.D. ............... ETH Zurich
Dwyer, Jerry, Ph.D. .................... Ireland
Kachi, Yasuyuki, Ph.D. ............... Tokyo
Matthews, Gretchen, Ph.D. .......... Louisiana Sate
Schulze, Timothy, Ph.D. .............. Northwestern
Todorova, Grozdena, Ph.D. .......... Moscow State
Tzermias, Pavlos, Ph.D. .............. California

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 courses numbered above 400. Of the additional hours, 6 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, for which 30 hours in courses numbered above 400 are required. Of these, 21 hours (at least 15 of which must be in mathematics) must be in courses numbered above 500.

For the 30 hours, 9 in courses approved by the advisory committee may be taken in fields other than mathematics. For this option it is also required that a written final examination be passed and that credit be received for a reading course (598) in which a term paper or project is required.

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), Biometry 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 Council:
1. Satisfy either the standard program or the interdisciplinary mathematical ecology concentration. A student intending to work in mathematical ecology may complete either but is encouraged to complete the interdisciplinary mathematical ecology concentration. A student may elect to switch from one to the other provided the course of the latter option have not been violated. A student's status after electing such transfer is determined by the complete history of the student's earlier mathematics examinations from the standard program and the interdisciplinary mathematical ecology concentration. Descriptions of both programs are given below.
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 dissertation 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 specialty examination only twice.

4. Pass a one-year, 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 UT).

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 and five additional subjects 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.


A student’s five subjects may not include both Real Analysis and Applied Linear Analysis or both Mathematical Principles of Fluid Mechanics and Mathematical Principles of Continuum Mechanics. A student may not count more than one 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 as 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:

a. The examinations to be taken must be approved in advance by the student’s advisory committee.

b. At any one time a student may take at most only the number of examinations necessary to complete the examinations.

c. A student may take a collection of 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 imposed above.

d. At least two examinations must be taken at least one must be passed before the student’s fourth year. Three examinations must be passed before the start of a student’s fifth year.

*In lieu of earning a grade of B+ or better each semester in a sequence from Group I, II or III, a student may demonstrate proficiency in that subject by passing the associated written examination. For this purpose, only one examination in each of the 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. Prerequisite.

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.

The student also must earn grades of B+ or better each semester in the courses associated with one additional subject from the groups listed in the standard program. This requirement may not be satisfied with courses from outside the department. At least one of the subjects used to meet this requirement or the written examination subject in 2. must be from Groups I and II.

Except for the privilege of utilizing as a Group IV course a course from outside the department, this concentration is subject to the constraints and privileges specified in the standard program, including the restrictions on related subjects, the conditions a. through c. of the standard program, and the option to pass a written examination in lieu of earning a grade of B+ or better each semester in a sequence from Group I, II or III.

GRADUATE COURSES

400 History of Mathematics (3) Development of major ideas in mathematics to modern times and influence of ideas in science, technology, philosophy, art, and other areas. Writing emphasis course: at least one in-class essay examination and 3000 words of writing outside classroom. Prereq: Matrix Algebra I and Introduction to Abstract Mathematics.

401 Mathematics and Microcomputers (3) Primarily for students seeking certification as mathematics teachers at secondary level. Use of microcomputers to study concepts and problems in mathematics. Does not satisfy the major requirements for a B.S. or M.S. in mathematics. Prereq: Calculus I.

403 Mathematical Methods for Engineers and Scientists (3) Matrix computations, numerical methods, partial differential equations, Sturm-Liouville Theory, and special functions used in engineering and science. Does not satisfy major requirements for a B.S. or M.S. in mathematics. Prereq: 231 Differential Equations I, 241 Calculus III, and familiarity with operating system and programming language.

404 Applied Vector Calculus (3) Topics from multivariable and vector calculus; line and surface integrals, divergence theorem and theorems of Gauss and Stokes. Prereq: Calculus III.

405 Models in Biology (3) Difference and differential equation models of biological systems. May not be counted toward graduate degree. Prereq: Calculus II or Biocalculus II.


421 Combinatorics (3) Introduction to problems of construction and enumeration for discrete structures: sequences, partitions, graphs, finite fields and geometries, or experimental design. Prereq: Probability and Statistics or consent of instructor.

423 Probability I (3) Axiomatic probability, multivariate distributions, conditional probability and expectations, methods of moment generating/characteristic functions. Laws of large numbers and central limit theorem. Prereq: 300-level probability or consent of instructor.

424 Probability II (3) Elements of stochastic processes: Random walk, Markov chains and Poisson processes. Other topics as selected by instructor. Prereq: 423.

425 Statistics (3) Derivation of standard statistical distributions; t, F and *2; independence of sample mean and variance; estimation; point and interval estimation, Bayesian statistics; statistical hypotheses; Neyman-Pearson theorem; likelihood ratio and other parametric and non-parametric tests; sufficient statistics. Prereq: Probability or consent of instructor.


443 Complex Variables I (3) Theory of functions of complex variable: residue theory and contour integrals. Prereq: Calculus III. Recommended prerequisite 300- or 400-level mathematics course.

445-46 Advanced Calculus I,II (3,3) Theory of sequences, series, differentiation, integration, set functions, integration of functions of one or more variables. Prereq: Calculus III and Introduction to Abstract Mathematics, or consent of instructor.


453 Matrix Algebra II (3) Matrix theory including Jordan canonical form. Prereq: Matrix Algebra I.

455-56 Abstract Algebra I,II (3,3) Algebraic structures: groups, rings, fields, vector spaces and linear transformations. Prereq: Matrix Algebra I and Introduction to Abstract Mathematics, or consent of instructor.


460 Geometry (3) Axiomatic and historical development of Euclidean, non-Euclidean, and hyperbolic geometry, stressing proof technique and critical reasoning. Models of Non-Euclidean geometries. Prereq: Introduction to Abstract Mathematics, or consent of instructor.

461 Topology (3) Topology of line and plane, separation properties, compactness and connectivity, continuous functions, homeomorphisms, and topological invariants. Prereq: Calculus III and Introduction to Abstract Mathematics, or consent of instructor.

471 Numerical Analysis (3) Computation, instabilities, and rounding, interpolation and approximation by polynomials and piecewise polynomials. Quadrature and numerical solution of initial and boundary value problems of ordinary differential equations, stiff sys-
applied problems; dimensional analysis and scaling, perturbation theory, variational approaches, transform theory, wave phenomena and conservation laws, stability and bifurcation, distributions, integral equations. Prereq: 446 or 448, 453, and either 511-12 or both 431 and 435.

5.17-18 Mathematical Methods in Physics (3,3) (Same as Physics 571-72.)

5.19 Seminar in Applied Mathematics (1-3) may be repeated. Maximum 12 hrs.


5.31-32 Ordinary Differential Equations (3,3) Existence, uniqueness, boundedness, continuation of solutions, linear equations, power series, Frobenius method. Prerequisites: 371, 435, 453. (Same as Computer Science 574.)

5.33 Calculus of Variations (3) Necessary conditions for extrema, Euler’s equation, broken extremals, Weierstrass-Erdmann conditions, sufficient conditions for extrema-Legendre’s and Jacobi’s conditions, conjugate points. Multiple integrals. Prereq: 431.

5.35-36 Partial Differential Equations (3,3) First order equations, characteristics, conservation laws, boundary value problems, elliptic, hyperbolic, and parabolic equations in several variables. Prereq: 445-46 and 231 or consent of instructor.


5.39 Seminar in Differential Equations (1-3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.


5.55-56 Number Theory (3,3) Introduction to algebraic number theory. Prereq: 455-56 or consent of instructor.

5.59 Seminar in Algebra (1-3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

5.61-62 Topology (3,3) Topological spaces; metrizability; homeomorphic invariants of point sets. Mappings and homotopies. Covering spaces and fundamental groups.

5.67-68 Differential Geometry (3,3) Classical differential geometry in two and higher dimensions: curves and surfaces in Euclidean space, Gauss map, curvatures, Gauss-Bonnet theorem, hyperbolic geometry. Manifolds and Riemannian metrics; connections, geodesics, Jacobi fields, sectional curvature. Differential forms and integrating frames. Prereq: 445-46 or consent of instructor.


5.75 Matrix Theory and Techniques in Numerical Analysis (3,3) Advanced topics in theory of iterative and direct methods for large systems of linear equations: sparse matrix analysis, relationship to modern computer architectures. Prereq: 453, 471-72, or consent of instructor. May be repeated. Maximum 9 hrs. (Same as Computer Science 575.)

5.77 Optimization (3) Major topics in optimization with problems developed from real-world applications including constrained and unconstrained optimization with analysis of major algorithms and utilization of appropriate software. Prereq: Numerical Algorithms. 453, 445-46.

5.78 Numerical Methods for Partial Differential Equations (3,3) Finite difference techniques and software packages for solution of partial differential equations including conservation laws and hyperbolic, parabolic, and elliptic problems. Derivation, physical meaning, and implementation of schemes. Prereq: 453 or 512 or 515, Fortran or C, or consent of instructor.

5.79 Seminar in Numerical Mathematics (1-3) May be repeated. Maximum 12 hrs.

663-64 Algebraic Topology (3,3) Homology, cohomology and homotopy theories: duality theorems and Hurewicz and Hopf invariance theorem. Prereq: 561-62 and 1 yr of abstract algebra, 455-56 or 551-52. May be repeated with consent of department. Maximum 12 hrs.

667-68 Advanced Differential Geometry (3,3) Selected topics from Riemannian geometry and analysis on manifolds: Lie groups, metric geometry, spectrum of Laplacian, Hodge Theory, variational problems, curvature and topology of manifolds. Prereq: 567-68 or consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

669 Seminar in Topology (3) May be repeated with consent of department. Maximum 12 hrs.


679 Seminar in Numerical Mathematics (1-3) May be repeated with consent of department. Maximum 12 hrs.

681-82 Advanced Mathematical Ecology (3,3) Selected topics in theoretical and applied mathematical ecology; population, community, ecosystem ecology and applied topics such as demography, ecoecology, epidemiology, environmental change and resource management. Prereq: 581-82. May be repeated. (Same as Ecology and Evolutionary Biology 681-682.)

### Mechanical, Aerospace and Biomedical Engineering

(College of Engineering)

**MAJOR**

**DEGREES**

Aerospace Engineering .......... M.S., Ph.D.

Engineering Science .......... M.S., Ph.D.

Mechanical Engineering .......... M.S., Ph.D.

T. E. Shannon, Interim Head

Professors:

- Antar, B. (UTSI), Ph.D. ................. Texas
- Ariamini, R. V., Ph.D. .................... VPI
- Baker, A. J., Ph.D. ...................... New York
- Carley, T. G. (Emeritus), 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., P.E., Ph.D. ............ Illinois
- Edmondson, A. J. (Emeritus), Ph.D. ...... Texas A&M
- Engels, R. C. (UTSI), Ph.D. ............ VPI
- Flandro, G. W. (UTSI), Ph.D. .......... Cal Tech
- Forrester, J. H. (Emeritus), Ph.D. ....... Iowa State
- Fortey, J. W. (Emeritus), Ph.D. .......... Toulouse (France)
- Frankel, J. I., Ph.D. ..................... VPI
- Garrison, G. W. (UTSI), Ph.D. .......... NC State
- Hodgson, J. W. (Emeritus), Ph.D. ....... Georgia Tech
- Jendrucko, R. J., Ph.D. .......... Virginia
- Johnson, W. S., Ph.D. ............ Clemson
- Keefer, D. R. (UTSI), Ph.D. .......... Florida
- Keyhani, M., Ph.D. ................. Ohio State
- Kim, K. H. (Emeritus), Ph.D. .......... NC State
- Krane, R. J., Ph.D. ................... Oklahoma
- Landes, J. D., PE, Ph.D. .............. Lehigh
- Lee, C. W. (Emeritus), Ph.D. .......... IllinoisIT
- Liston, H., Jr., M.E.A. .............. George Washington
- Lo, C. F. (UTSI), Ph.D. .......... Cornell
- McCoy, M. H. (UTSI), Ph.D. .......... Florida
- McCoy, T. D. (UTSI), Ph.D. .......... Auburn
- Maxwell, R. L. (Emeritus), Ph.D. ...... 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), D.A.S. ......... Brussels
- Ph, H. (Emeritus), PE, Ph.D. .......... IllinoisIT
- 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. .......... Ohio State
- Shannon, T. E., PE, Ph.D. .......... Tennessee
- Shobe, L. R. (Emeritus), PE. .......... Tennessee

Associate Professors:

- Boulet, J. A. M., Ph.D. .......... Stanford
- Freeman, J. S., Ph.D. ............... Wisconsin
- Hand, W. R., Ph.D. ............... Tennessee
- Hopkins, J. A. (UTSI), Ph.D. .......... Cal Tech
- Iannelli, G. S., Ph.D. .......... Tennessee
- Kasara, M., Ph.D. .......... Ecole Polytechnique (Canada)
- Kawiacki, G., Ph.D. .......... West Virginia
- Lumsdaine, A., Ph.D. .......... Michigan
- Lyne, J. E., M.D., Ph.D. .......... NC State
- Madhu, M.S., Ph.D. ............. Drexel
- Moulden, T. H. (UTSI), Ph.D. .......... Tennessee
- Nguyen, K., Ph.D. .......... Colorado
- Pionke, C., PE, Ph.D. .......... Ga Tech
- Yu, N., Ph.D. .......... California (San Diego)

Assistant Professors:

- Bond, R. E., Ph.D. .......... West Virginia
- English, A., Ph.D. .......... Harvard
- Kress, R. L., PE, Ph.D. .......... Arizona
- Zheng, M., Ph.D. .......... Calgary (Canada)
Graduate programs leading to the degrees 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 prerequisites before entering a program. A dual M.S.-MBA degree program with a concentration in product development and manufacturing is also available with a major in Mechanical Engineering or in Engineering Science.

In Mechanical Engineering, program concentrations include dynamics, control, and robotics; energy conversion and utilization; gas dynamics; heat transfer and fluid mechanics; machine design; power generation; product development and manufacturing (MS only); propulsion; space engineering; stress analysis; and thermodynamics.

In Aerospace Engineering, program concentrations include aeroacoustics; aerodynamics and performance; energy conversion and utilization; flight and aerospace mechanics; gas dynamics; heat transfer and fluid mechanics; propulsion; space engineering; structures and stress analysis; and thermodynamics.

In Engineering Science, program concentrations include applied artificial intelligence, biomedical engineering, computational mechanics, fluid mechanics, mechanics of composite materials, solid mechanics, industrial engineering (Ph.D. only), product development and manufacturing (MS only), 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 Application for Admission. Admission into the doctoral program will be granted to those applicants who have demonstrated superior achievement and 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 Application for Admission. 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 Council. 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 other 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>
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</thead>
<tbody>
<tr>
<td>Thesis credit</td>
<td>6 n/a</td>
</tr>
<tr>
<td>Coursework</td>
<td>24 30</td>
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<tr>
<td>Courses in program (500-level or above) (min.)</td>
<td>12 18</td>
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<tr>
<td>Mathematics (400-level or above)</td>
<td>6 6</td>
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<tr>
<td>590 Selected Engineering Problems (max.)</td>
<td>n/a 6</td>
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<td>Total</td>
<td>30 30</td>
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Credit requirements for these two options in Engineering Science are:

<table>
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<tr>
<th>Course Areas</th>
<th>Hours Required</th>
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<tbody>
<tr>
<td>Thesis credit</td>
<td>6 n/a</td>
</tr>
<tr>
<td>Coursework</td>
<td>24 30</td>
</tr>
<tr>
<td>Engineering courses (Major concentration may include but is not restricted to course offered by the Department.) (min.)</td>
<td>12 15</td>
</tr>
<tr>
<td>Mathematics (400 level or above)</td>
<td>6 6</td>
</tr>
<tr>
<td>Related courses (May include additional courses in mathematics, computer science, or the physical and life sciences as well as engineering courses.) (max.)</td>
<td>6 9</td>
</tr>
<tr>
<td>590 Selected Engineering Problems (max.)</td>
<td>n/a 6</td>
</tr>
<tr>
<td>Total</td>
<td>30 30</td>
</tr>
</tbody>
</table>

For all program options, other 500 level engineering courses that are approved by the student’s master’s committee and the graduate programs committee may be substituted for the mathematics courses. All program options require participation in the departmental graduate seminars program, passing a final qualifying examination on all work submitted for the degree. The final examinations in Option II will cover all coursework. The thesis option, Option I, requires submission and defense of a written thesis that demonstrates the ability to conduct and report an independent investigation.

DUAL M.S.-MBA PROGRAM

The College of Business Administration and the College of Engineering offer an integrated program leading to the conferment of the Master of Business Administration degree with a major in Business Administration (concentration in operations management) and the Master of Science degree with a major in Engineering Science or Mechanical Engineering (concentration in product development and manufacturing).

The Engineering Science program is intended to provide other engineering majors an opportunity to participate in this program with a flexible coursework plan based on their undergraduate degree.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate an increasingly complex body of knowledge for rapid introduction of new products to the marketplace. The objective of the dual degree program is to prepare graduates to take a leading management role in companies that must react quickly to a dynamic market where forces of competition require rapid changes in design and manufacturing and a short product development cycle.

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 Office of Graduate Admissions for the Master of Business Administration degree program and the Master of Science degree program with a major in Engineering Science or Mechanical Engineering, and by the Dual Program Committee.

Students will initially apply for the MBA program, indicating on their application the intent to pursue the dual M.S.-MBA program and the appropriate engineering major (refer to the MBA program for separate instructions). Students accepted for both the MBA and the M.S. with a major in Engineering Science or Mechanical Engineering programs will be assigned to Dual Program Committee advisors, who will be responsible for course approval and supervision of the students’ 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 Office of Graduate Admissions for international students.

Curriculum

All engineering students enrolled in the program must complete common coursework designed to provide them with an integrated, multidisciplinary teamwork experience. The MBA curriculum in product development and manufacturing consists of 20 hours of common coursework in the College of Business Administration and 15 hours of common coursework in the College of
### Curriculum for Dual M.S.-MBA Degree – Major in Mechanical Engineering

<table>
<thead>
<tr>
<th>August - First Year</th>
<th>Fall - First Year</th>
<th>Spring</th>
<th>Fall - Second Year</th>
<th>Summer</th>
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<tr>
<td>BA 511 MBA Core I</td>
<td>BA 512 MBA Core II</td>
<td>BA 513 MBA Core III</td>
<td>IE 511 Business Planning and Commercialization</td>
<td>BA 514 Internship</td>
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<tr>
<td>Fall - Second Year</td>
<td>Fall - Second Year</td>
<td>Spring</td>
<td>Fall - Second Year</td>
<td>Summer (first session)</td>
</tr>
<tr>
<td>IE 511 Business Planning and Commercialization</td>
<td>MBA “hub” course elective 3</td>
<td>MBA “hub” course elective 3</td>
<td>ME 594 Culminating Integrated Project Report 3</td>
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<td>Mechatronics 3</td>
<td>Design Tools 5</td>
<td>Math/Engineering Elective (select with advisor) 3</td>
<td>ME 594 Culminating Integrated Project Report 3</td>
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The dual degree candidate must satisfy the curriculum and graduation requirements of the engineering major being pursued and the College of Business Administration. Students withdrawing from the dual degree program before completing both degrees will not receive credit toward graduation in either degree program for courses taken in the other degree program, except as such grades 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.

**Approval Dual Credit**

A maximum of 15 semester hours of the common program courses completed in the College of Engineering may be counted toward the MBA degree program.

### 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 with 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.

### 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 states of Kentucky or South Carolina. The Ph.D. program in Aerospace Engineering is available to residents of the states of Arkansas or Kentucky. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

### GRADUATE CREDIT FOR UNDERGRADUATE COURSES

Students majoring in Mechanical Engineering or Aerospace Engineering may not normally use more than one 400-level engineering course to meet their advanced degree requirements. Undergraduate courses that are required for the bachelor’s degree in Mechanical Engineering may not be taken for graduate credit by graduate students in Mechanical Engineering. Undergraduate courses that are required for the bachelor’s degree in Aerospace Engineering may not be taken for graduate credit by graduate students in Aerospace Engineering. For students majoring in Engineering Science, 400-level courses in
Aerospace Engineering

NOTE: Not all the courses listed below are available at both the UT and the UTSSi campuses.

GRADUATE COURSES

422 Aerodynamics (3) Theory and design of aerodynamic bodies for desired characteristics. Potential flow theory, viscous effects, compressibility effects. Subsonic boundary layers and supersonic airfoils. Prereq: 351 Compressible Flow, 370 Airplane Performance. F

424 Astronautics (3) Orbital mechanics, propulsion, atmospheric reentry of space vehicles; reentry thermal-protection materials, human factors in space flight, space environment and current topics. Prereq: 351 Compressible Flow. Coreq: Mechanical Engineering 344 Heat Transfer. F

425 Propulsion (3) Principles of propulsion devices; turbo-jet, ram jet and rocket engines. Prereq: 351. F

426 Introduction to Aerospace Design (2) Design process, synthesis, safety, reliability, patents, product liability, economic analysis, optimization, design standards, design studies. Individual design reports. Prereq: 351, 370, 363. Coreq: Mechanical Engineering 344. F

429 Aerospace System Design (4) Synthesis and design of complete aerospace system. Participation in team design effort: formal presentations and design report. Prereq: 422, 425, 426. Sp


494-95 Selected Topics in Aerospace Engineering (1-4,1-4) Problems and topics related to developments and practice in aerospace engineering. Prereq: Consent of instructor. E

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

502 Registration for Use of Facilities (1-15) 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 Inviscid Flow (3) Kinematics and dynamics of inviscid fluids; potential flow about body, conformal mapping. Prereq: 422 or 541, Mathematics 425 or equivalent.

512 Viscous Flow (3) Derivation of fundamental equations of compressible viscous flow; boundary conditions for gas dynamics; conducting flow; exact solutions for Newtonian viscous flow (Navier-Stokes) equations for special cases; similarity solutions. Thermal boundary layers, stability of laminar flows, transition to turbulence, 2-D turbulent boundary layer equations. Incompressible-turbulent mean flow, and compressible boundary layer flow. Prereq: Consent of instructor.

513 Experimental Methods in Fluid Mechanics (3) Experimental techniques with laboratory experiments; representative experiments: hot wire anemometry and turbulence measurements, flow visualization, wind tunnel tests, water table experiments, supersonic flow experiments, boundary layer measurements, laser-optical measurements. Prereq: 423 Viscid Flow or 541.

515-16 Air Vehicle Aerodynamics and Performance (3,3) Application of aerodynamic principles to air vehicles to provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speed; lift, drag, lift-drag ratio, wing-body interference, propulsion systems, vehicle performance characteristics, and trajectory optimization. Prereq: 422; 515 for 516.

521-22 Aerodynamics of Compressible Fluids (3,3) One-dimensional and external flow; waves; small perturbation theory; slender body theory; similarity rules; method of characteristics. Prereq: 422 for 521; 521 for 522.

525 Hypersonic Flow (3) Slender body flow; similarity; Newtonian theory; blunt body flow; viscous interactions; free molecule and rarefied gas flow. Prereq: 512.

527-28 Aerospace Ground Test Facilities (3,3) Atmospheric and space models; space environment and space vehicle test facilities. Prereq: 521, 541 and Mechanical Engineering 522.

529 Rarefied Gasdynamics (3) Binary elastic collision theory; kinetic theory; flow regimes; Boltzmann and model equations, transfer equation, gas-surface interactions; slip between free molecule, slip and transition flow. Monte Carlo simulation; experimental techniques; introduction to hypersonic real gas flows. Prereq: 522, Mechanical Engineering 522.

531 Magnetohydrodynamics (3) Electromagnetic field theory; chemical kinetics; thermodynamic and thermophysical properties of gas plasmas; governing equations and applications. Prereq: 422 and Mathematical Physics 471.

532 Introduction to Turbulence (3) Macroscopic effects, turbulence, measurement, turbulence functions, energy spectra, diffusion;application of turbulent jets and pipe flow. Prereq: 511-12.

533 Dynamics (3) (Same as Mechanical Engineering 533 and Engineering Science 533.)

534 Atmospheric Entry (3) Reentry trajectories; lift and drag; reentry vehicle motion and stability during reentry; aerodynamic heating and heat protection systems. Prereq: 522. Recommended prereq: 512.

535 Mechanical Vibrations (3) (Same as Mechanical Engineering 534 and Engineering Science 534.)

539 Continuum Mechanics (3) (Same as Engineering Science 559 and Mechanical Engineering 559.)

541 Fluid Mechanics I (3) (Same as Mechanical Engineering 541 and Engineering Science 541.)

542 Fluid Mechanics II (3) (Same as Mechanical Engineering 542 and Engineering Science 542.)

544 Transonic Flow (3) Nature of flow at transonic speeds; small disturbance theory; shock wave properties; shock-free flows; strong viscous interaction phenomena; similarity solutions. Prereq: 522.


552-53 Advanced Strength of Materials (3,3) (Same as Mechanical Engineering 553-56 and Engineering Science 521-22.)

554 Aerospace Vehicle Stability and Control (3) Static and dynamic longitudinal directional and lateral stability and control. Coupled modes. Motion with free and fixed flight control surfaces. Automatic control systems. Prereq: 423, 551.


561 Fundamentals of Aeronautics (3) Generation, propagation and absorption of sound in static and moving media. Prereq: Consent of instructor.

564 Spacecraft Attitude Dynamics and Control (3) Rotational attitude to governing equations. Gyroscopic instruments and passive and active attitude control devices. Linear control theory and attitude stabilization. Prereq: 551, Mathematics 471.

571 Finite Elements for Engineering Applications (3) (Same as Engineering Science 551 and Mechanical Engineering 561.)

572 Computational Fluid Dynamics (3) (Same as Engineering Science 552 and Mechanical Engineering 562.)

573 Computational Solid Mechanics (3) (Same as Engineering Science 553 and Mechanical Engineering 563.)

574 Space Engineering: Satellite Technology (3) Satellites and rockets (orbit, launch vehicles and launching), spacecraft structure, power systems, attitude control system, telemetry/tracking/command and data communications, spacecraft testing, reliability, and application of satellites (communication, weather, Earth observation, and future applications). Prereq: 425, Mathematics 471, 404.

590 Selected Engineering Problems (2-6) Enrollment limited to students in problems program. Prereq: Consent of advisor. May be repeated. Maximum 6 hrs. S/NC only.

595 Seminar (1) All phases of aerospace engineering, reports on current research at UT and UTSSi. May be repeated. S/NC only.

599 Special Topics in Aerospace Engineering (1-3) May be repeated. Maximum 6 hrs.

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

631 Magnetohydrodynamics I (3) Electromagnetic field equations, motions of single charged particle, Boltzmann equation, conduction and diffusion in ionized gases, continuum magnetohydrodynamic equations. Prereq or coreq: 512. Prereq: Mathematics 561 or equivalent.

632 Magnetohydrodynamics II (3) Aliven and shock wave solutions of governing equations; channel flow, one-dimensional model of channel flow, engineering applications of magnetohydrodynamics. Prereq or coreq: 512. Prereq: Mathematics 561 or equivalent.

641-42 Physical Gas Dynamics (3,3) High speed, high temperature gas flow from molecular point of view. Kinetic theory, statistical mechanics, equilibrium flow, vibrational and chemical rate processes, non-equilibrium vibrational and chemical flow, non-equilibrium kinetic theory, flow with translational non-equilibrium. Prereq: 522, Mechanical Engineering 522.

645 Theory of Turbulence (3) (Same as Engineering Science 545.)

661-62 Advanced Topics in Computational Fluid Dynamics (3,3) (Same as Engineering Science 651-52 and Mechanical Engineering 651-52.)

663-64 Advanced Topics in Computational Solid Mechanics (3,3) (Same as Engineering Science 653-54 and Mechanical Engineering 653-54.)


690 Advanced Topics in Aerospace Engineering (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.
Biomedical Engineering

GRADUATE COURSES

528 Ceramic Matrix Composites: Material and Mechanics (3) Micromechanics and microstructural design; fabrication of ceramic matrix composites; interface characterization and mechanics; electron microscopy examination; nondestructive evaluation; fracture; fatigue; applications. Prereq: Consent of instructor. (Same as Materials Science and Engineering 528.)

529 Fatigue of Engineering Materials (3) Fatigue life prediction, crack initiation, crack propagation. Variable amplitude loading, multi-axial loading, environmental fatigue, creep fatigue, metallurgical and microstructural variables, fractography, non-metals. Prereq: Consent of instructor. (Same as Materials Science and Engineering 529.)

533 Dynamics (3) (Same as Mechanical Engineering 533 and Aerospace Engineering 535.)

534 Mechanical Vibrations (3) (Same as Mechanical Engineering 534 and Aerospace Engineering 535.)

539 Continuum Mechanics (3) Cartesian tensors, transformation laws, 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 Finite Elements for Engineering Applications (3) Computational procedures for differential equation statements in engineering and sciences. Approximation, boundary condition imposition, finite element implementations; comparison to legacy finite difference methods. Applications in 1, 2, and 3 dimensions, non-linearity, unsteady problems, coupled system equations. Examples from diverse technical fields: fluid mechanics, heat/mass transfer, elasticity, electromagnetics, reacting systems. Computational projects. Prereq: Graduate degree in engineering or natural science. (Same as Aerospace Engineering 561 and Mechanical Engineering 571.)


553 Computational Solid Mechanics (3) Finite element techniques in structural mechanics and linear elasticity: two- and three-dimensional formulations; isoparametric elements, numerical quadrature. Equations solving, matrix iteration techniques. Applications in beams, plates and shells; use of representative computer programs in PC and networked Unix/CAD solids modeler. Prereq: 321 Mechanics of Materials I or equivalent. (Same as Aerospace Engineering 563 and Mechanical Engineering 573.)

564 Laser Processing of Materials (3) Physics and engineering of lasers, beam characteristics, focusing of materials and composites. Physics: lasers, optics, plasmas, heat transfer, phase transformations, solidification and fluid flow processes; welding, physical metallurgy, of welding, theories of segregation and porosity formation, drilling, cutting, machining, brazing, soldering, glazing, alloying and diffusion processes. Prereq: 562 and 563. (Same as Mechanical Engineering 564.)

568 Optical Engineering I (4) Wave optics; scalar diffraction theory; introduction to Fourier optics; ray or geometric optics; first-order paraxial design methods; introduction to aberrations.

568 Optical Engineering II (4) Statistical optics; spontaneous and induced emission: black and gray body radiation; incoherent, 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 mechanics of living tissue. Continuum mechanics analysis of hard and soft tissue, biological fluid flows. Flow properties of blood, rheology of blood in micro vessels; viscoelasticity of fluids and solids, mechanical properties of blood vessels; skeletal muscle and smooth muscle analysis, artificial heart valves and in extracorporeal devices. Prereq: 541. (Same as Biomedical Engineering 571.)

572 Biomedical Fluid Mechanics (3) Application of fluid mechanics theory to fluid flows in living systems. Applications to differential equations of motion for blood flow in arteries, veins and the microcirculation. Measurement of flow properties of blood and other biophysical fluids. Analysis of pathologies for blood flow through arterial stenoses. Study of flow through artificial heart valves and in extracorporeal devices. Prereq: 541. (Same as Biomedical Engineering 572.)

576 Expert Systems in Engineering (3) (Same as Nuclear Engineering 576 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. Consent of instructor. May be repeated with consent of department.

585 Industrial Pollution Prevention (3) (Same as Chemical Engineering 581 and Environmental Engineering 585.)

590 Selected Engineering Problems (2-6) Enrollment limited to students in programs program. Prereq: Consent of advisor. May be repeated. Maximum 6 hrs. S/NC only.

595 Seminar (1) All phases of engineering science, reports on current research at UTK and UTMS. May be repeated. S/NC only.

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

624 Viscoelasticity (3) Viscoelastic constitutive relations; isothermal boundary value problems; wave propagation in viscoelastic materials; stability problems in determination of viscoelastic properties. Prereq: 523, and 539 or Materials Science and Engineering 541.


641 Advanced Topics in Fluid Mechanics and Convective Heat Transfer (3) Convective momentum, heat and mass transfer; boundary layer analysis, stability, transition, turbulence, closure models; Navier-Stockes equations, closure procedures; time- and ensemble-averaging, large scale structures; high speed flow, reacting, nonreacting, excitation, ionization. Applications in propulsion, lasers, aerodynamics. Prereq: 542.

645 Theory of Turbulence (3) Mathematical descriptions of turbulence; isotropic boundary layer, Kolmogorov's hypothesis, and small eddies. Turbulent transition for turbomachinery; diffusion by continuous movement; applications to turbulent jets, wakes, pipe flow, and boundary layers. Prereq: 542. (Same as Aerospace Engineering 645.)

651-52 Advanced Topics in Computational Fluid Dynamics (3) Modern approximation theory for non- linear Navier-Stokes systems. Algorithm construction; finite element, finite volume; accuracy, convergence, stability, smooth and non-smooth solutions; shocks, artificial dissipation mechanisms. Two- and three-dimensional, compressible viscous and inviscid

Engineering Science

GRADUATE COURSES

500 Thesis (1-15) N/3 only. E

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester in a University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E


523 Theory of Elasticity (3) Equations of equilibrium; strain-displacement relations, compatibility, and constitutive equations in three-dimensions. Beams, disks, thick-walled tubes, plates with holes; stress concentration; thermal stresses in beams, rings, plates, and shells; thermal buckling problems.


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 661-62.)

563-54 Advanced Topics in Computational Solid Mechanics (3,3) Fracture mechanics; singularity solutions; pseudo-linear constitutive problems, variable stiffness, initial strain-stress methods, plasticity, creep; geometrically non-linear problems, large deflection, stability, shell structures, solids; accuracy, convergence, adaptive grids; systems of nonlinear equations, solvers. Use of production-level finite element software. Computer projects. Prereq: 553. (Same as Aerospace Engineering 563-54 and Mechanical Engineering 663-64.)

567 Computational Mechanics Seminar (1) Current developments in computational fluid/thermal/structural mechanics. For departmental thesis students only. May be repeated.

671 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 or individually. Permission of instructor. May be repeated with consent of department.

**Mechanical Engineering**

NOTE: Not all the courses listed below are available at both the UT and the UT System campuses.

**GRADUATE COURSES**


452 Computational Mechanics (3) Integration of fundamental physical laws, mathematical methods and computational techniques necessary to develop engineering analysis and design capabilities. Finite element method. Prereq: Aerospace Engineering 341 Fluid Mechanics. F

455 Introduction to Design (2) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering solid mechanics system. Participation in team design effort; design report. Prereq: Dynamics and Vibrations of Machines. Spring.

456 Introduction to Thermal 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


469 Machine Design (4) Design of complete machine; documentation, complete specifications, design calculations, working drawings, and cost analysis. Written and oral report. Prereq: 455, 466. Sp

471 Refrigeration and Air Conditioning (3) Vapor compression and absorption cycles; heat pump systems; psychrometric processes; air washers; cooling towers; solar radiation; building heating transmission. Prereq: 332, 344.

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

479 Thermal Engineering Design (4) Design of complete thermal-fluid system, economic, technical and optimization aspects. Participation in team design effort, formal presentations and design report. Prereq: 456, 475. Sp

483 Introduction to Reliability Engineering (3) (Same as Nuclear Engineering 483, Chemical Engineering 484, and Industrial Engineering 483.)

484 Introduction to Maintenance Engineering (3) (Same as Nuclear Engineering 484, Chemical Engineering 484, Industrial Engineering 484, and Materials Science and Engineering 484.)

494-95 Selected Topics in Mechanical Engineering (1-4,1-4) Problems and topics related to developments and practice in mechanical engineering. Prereq: Consent of instructor. E

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester the facility is used by 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 Product Development Process (1) Basic elements in product development process and project management. Business and engineering interrelations to development and commercial manufacturing of new products. Multidisciplinary teams to explore possible new product opportunities. Prereq: Consent of instructor. (Same as Industrial Engineering 504.)


506 Product Selection and Evaluation (2) Development of operational requirements and features for new product having potential for business venture. Market potential, design feasibility and manufacturing requirements. Design alternatives created and evaluated against set of performance requirements determined from brainstorming. Final product concept selected by end of semester. Prereq: 504. (Same as Industrial Engineering 506.)

507 Application of Linear Algebra in Engineering Systems (3) (Same as Chemical Engineering 507, Electrical and Computer Engineering 507, and Materials Science and Engineering 507.)

508 Integrated Product, Process and Manufacturing System Design (3) (Same as Industrial Engineering 508.)

509 Project Management (1) (Same as Industrial Engineering 509.)

510 Prototype Development and Evaluation (3) Prototype of selected project made and tested against required operating conditions. Design changes implemented to meet customer’s needs. Fabrication drawings and manufacturing plans finalized for introduction of product. Prototype development managed using project management plan. Prereq: 555.


512 Heat Transfer II (3) Analysis of steady-state and time-dependent heat conduction by numerical methods. Analysis of laminar and turbulent convection heat transfer in internal and external flows, forced and buoyancy driven flows. Prereq: 541.

514 Phase Change Heat Transfer (3) Mechanisms and modeling of nucleate, transition and film boiling processes; critical heat flux; forced convection boiling and post dry-out heat transfer; condensation processes; heterogeneous nucleation; dropwise and filmwise condensation; flow condensation; liquid-solid phase change processes; boundary layers fronts; mathematical modeling. Prereq: 344, 511.


521-22 Thermodynamics I and II (3,3) Macroscopic thermodynamics, including First and Second Law analyses, availability, phase and chemical equilibrium thermodynamics; macroscopic and microscopic properties, determination of thermodynamic properties from molecular structure, spectroscopic data, kinetic theory, statistical mechanics, quantum physics, Schroedinger equation. Prereq: 332.

523 Special Topics in Thermodynamics (3) Application of thermodynamics to topics of current interest in mechanical engineering. Prereq: Consent of instructor.

525 Combustion and Chemically Reacting Flows (3) Fundamentals; reaction processes and codes. Chemistry and kinetics, and conservation equations; phenomenological approach to laminar flames; diffusion and premixed flame theory; single droplet combustion; deflagration and detonation theory; stabilization of combustion waves in laminar flames; flammability limits of premixed laminar flames; introduction to turbulent flames. Prereq: 522, 541, or consent of instructor.

526 Combustion and Chemically Reacting Flows II (3) Advanced topics: phenomenological approaches to turbulent flames; fundamentals of turbulent flow; application of probability density functions to turbulent flames; stability of nascent reacting mixtures and/or laminar flames; non-premixed reactants; spray combustion models; fluidized bed combustion; chemically reacting boundary layers; fluidized bed; gas-turbine combustors; furnace; introduction to supersonic combustion and hypersonic flows. Prereq: 525.

533 Dynamics (3) Kinematics and dynamics of particles in three dimensions. Rotating coordinate systems, Hamilton’s principle. Lagrange’s equations of motion. Kinematics and dynamics of rigid bodies. Prereq: Mathematics 431 or Engineering Analysis, undergraduate vibrations course. (Same as Aerospace Engineering 533 and Engineering Science 533.)

534 Mechanical Vibrations (3) Vibrations of linear, discrete, undamped and damped systems. Lagrange’s equations for holonomic systems. Modal analysis. Laplace and Fourier transform. Mechanical and electrical transients. Prereq: Undergraduate vibrations course. (Same as Aerospace Engineering 535 and Engineering Science 534.)


539 Continuum Mechanics (3) (Same as Engineering Science 539 and Aerospace Engineering 539.)

541 Fluid Mechanics I (3) Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton’s second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows. Prereq: Fluid mechanics. (Same as Aerospace Engineering 541 and Engineering Science 541.)

551-52 Mechanical Engineering Design (3,3) Design of mechanical engineering devices and systems. Prereq: Consent of instructor.

555 Design Tools (5) Project driven. Skills for using relevant software design tools to perform assigned design tasks. Course completion and timing of subject material modified to meet specific needs of each project. Prereq: Consent of instructor.

561 Finite Elements for Engineering Applications (3) (Same as Engineering Science 551 and Aerospace Engineering 571.)

562 Computational Fluid Dynamics (3) (Same as Engineering Science 552 and Aerospace Engineering 572.)

563 Computational Solid Mechanics (3) (Same as Engineering Science 553 and Aerospace Engineering 573.)

576 Expert Systems in Engineering (3) (Same as Nuclear Engineering 576 and Engineering Science 576.)

577 Neural Networks in Engineering (3) (Same as Nuclear Engineering 577 and Engineering Science 577.)

581 Rocket Propulsion I (3) Rocket propulsion fundamentals; thermodynamics of nonreacting and chemically reacting ideal gases, rocket nozzle design; ideal rocket engines, rocket engines with external heat transfer; chemistry of propellants; liquid rocket engine systems; ground testing; introduction to solid propellant rockets. Prereq: Consent of instructor.

582 Rocket Propulsion II (3) Solid propellant rocket performance; homogeneous and heterogeneous propellant chemistry and combustion system performance; thermal decomposition and gas phase reaction models; effect of chamber pressure and additives on solid propellant burn rates, erosive burning; analysis of two-phase solid rocket exhaust flow. Introduction to nuclear and electric propulsion; electrical resistance and electric field (ion) engine performance, magnetohydrodynamic thrusters, traveling wave thrusters, exotic propulsion systems. Prereq: Consent of instructor.

584-85 Turbomachinery Systems I, II (3,3) Ideal cycle analysis of turboengines, real cycle analysis, component performance analysis, component design and systems integration (inlets, nozzles, combustors, compressors, turbines), flowthrough theory, turbine engine component matching, transient operation, surge and rotating stall, engine control systems, structural considerations. Prereq: First year graduate standing and consent of instructor.

586 Mechanics and Control of Robotic Manipulators (3) Fundamentals of robotic manipulation: kinematics and dynamics of manipulators, control system design, trajectory planning, advanced force and impedance control strategies. Prereq: 451, 533, or equivalent.


588 Introduction to Hybrid Electric Vehicles (3) Series, parallel, and dual configurations. Sizing and analysis of typical HEV components: motors, auxiliary power sources, on-board energy storage, and fuels. Steady-state HEV power and power flow modeling schemes. Power train design using virtual computer simulation tools. Prereq: Consent of instructor.

589 Hybrid Electric Vehicle Control Systems Design and Analysis (3) Dynamic modeling, simulation and analysis of complete hybrid electric vehicle systems. Linear control design techniques and discrete logic design applied to HEV power trains and operating mode controls. Digital and real-time control and hardware issues of automotive systems. Design and human factors engineering issues of vehicle controls and displays. Prereq: 588 or consent of instructor.

590 Selected Engineering Problems (2-6) Enrollment limited to students in problems program. Prereq: Consent of advisor. May be repeated. S/NC only.

594 Cumulating Integrated Project Report (3) Final phase of product development process. Multidisciplinary teams submit and defend comprehensive project report. Report includes all engineering and business considerations needed to convince potential investors to fund proposed business venture. Prereq: Consent of instructor. (Same as Industrial Engineering 594.)

595 Seminar (1) All phases of mechanical engineering reports on current research at UTK and UTSAI. May be repeated. S/NC only.

599 Special Topics in Mechanical Engineering (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

600 Doctoral Research and Dissertation (3-15) Prereq: NP only.

610 Advanced Topics in Fluid Mechanics and Heat Transfer (3) Advanced theory and application of fluid mechanics and heat transfer; natural convection, multi-phase flow, high speed reacting and nonreacting flows, advanced boundary layer techniques, combustion, perturbation and variational methods of analysis, heat exchanger theory and design. May be repeated. Maximum 9 hrs. Prereq: Consent of instructor.

613 Advanced Radiation Heat Transfer (3) Radiation heat transfer in absorbing, emitting and scattering media; interaction of thermal radiation with conduction and convection heat transfer. Prereq: 511, 512.


651-52 Advanced Topics in Computational Fluid Dynamics (3,3) (Same as Engineering Science 651-52 and Aerospace Engineering 661-62.)

653-54 Advanced Topics in Computational Solid Mechanics (3,3) (Same as Engineering Science 653-54 and Aerospace Engineering 663-64.)


671 Advanced Topics in Applied Artificial Intelligence (3) (Same as Nuclear Engineering 671 and Engineering Science 671.)

686 Telerobotic Systems (3) Analysis of modern telerobotic concepts: review of current research and literature in telerobotic systems; review of current research in telediagnostic systems; robotics systems, and telerobotic systems: human-machine interfaces, control system architectures, data communications, and sensing. Virtual reality-based, and internet-based systems concepts. Prereq: 586 or consent of instructor.


Medical Biology

See College of Veterinary Medicine and Comparative and Experimental Medicine

Microbiology

(College of Arts and Sciences and College of Veterinary Medicine)

MAJOR DEGREES

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
Montie, T. C. (Emeritus), Ph.D. ............................. Maryland
Moore, R. N., Ph.D. .............................. Texas
Riggsby, 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., Ph.D. ........................................ Texas
White, D. C. (Distinguished Scientist), Ph.D. .............................. Rockefeller
Woodward, J. M. (Emeritus), Ph.D. .............................. Kansas

Associate Professors:

Hacker, David, Ph.D. .............................. Michigan State
Small, Pamela, Ph.D. .............................. Stanford

Assistant Professors:

Urbach, Ena, Ph.D. .............................. Montana
Wilhelm, Steve, Ph.D. .............................. Western Ontario

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 calculus, (3) two years of chemistry, including one year of organic, (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 carrying 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 needed 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 or four 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 semesters 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. Sp

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. Coreq: 420. Sp

430 Immunology (3) Principles of inflammation and immunity; immunoglobulin structure and theories of formation and diversity; complement, hypersensitivities, cell cooperation and recognition 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 (1-15) 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 requirement. 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 areas in department through series of rotations in laboratories of individual faculty members. May be repeated. Maximum 3 hrs. S/NC only.

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

610 Topics in Microbial Physiology (1-3) Prereq: 410 or consent of instructor. May be repeated. Maximum 12 hrs.

620 Topics in Microbial Pathogenesis (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: 411 or consent of instructor. May be repeated. Maximum 12 hrs.

670 Advanced Topics in Environmental Microbiology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

THE DOCTORAL PROGRAM

See College of Veterinary Medicine and Comparative and Experimental Medicine

Modern Foreign Languages and Literatures

MAJORS

French

German

Spanish

Modern Foreign Languages

DEGREES

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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, 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 Mittelstufenprüfung. 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 6 at the 400 level, the rest at the 500 level, including Spanish 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.

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 12 hours in the second concentration; and at least 6 hours in a cognate field or in either the first or second concentration as approved by the student’s graduate committee.

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 or in either the first or second concentration as approved by the student’s graduate committee. 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 SACS 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: 1200 level: A maximum 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 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: 1200 level: A maximum of 6 hours of 400-level classes taken for the M.A. may be applied.

500 level: A minimum of 21 (Track I) or 27 (Track II) hours must be taken. These must include French 512, 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, 435, 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. With the consent of the student’s graduate committee, the 6 hours in the cognate field may be substituted by 6 hours in either the first or second concentration.

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 Teachers Examination, the MLA Examination for Teachers and Advanced Students, or the proficiency standards of the United States Foreign Service Institute (FSI).

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, McCler, 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 Administrative Services Assistant in the Office of Graduate Admissions.

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 Rabelais and Montaigne; readings of poems from writers from Lyon and members of Pléiade. Prereq: 300-level literature course.


413 French Literature of the 18th Century (3) Major works of Enlightenment. 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. (Same as Cinema Studies 420).

421 Phonetics (3) Foundation in science of phonetics. Practical exercises and individual performance. Graduate credit not offered to students majoring in Romance language. 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 French for Business.

423-24 Advanced Conversation (1,1) Informal conversation with native speaker on contemporary topics. Requires in-class contact rather than outside preparation. Prereq: Intermediate Composition and Conversation or French for Business. 2 hrs. weekly.

425 Introduction to Descriptive Linguistics (3) Theory and practice of techniques of linguistic analysis in subfields of phonetics, phonology, morphology, syntax, semantics, pragmatics and historical linguistics; discussion of relevance to teaching and learning of foreign languages and to study of literary texts. Recommended prereq: Language, Linguistics and Society. (Same as German 425, Linguistics 425, and Spanish 425.)

426 Methods of Historical Linguistics (3) (Same as German 426, Spanish 426 and Linguistics 426.)

429 Romance Linguistics (3) Development of Classical Latin through Vulgar Latin into major Romance languages. (Same as Spanish 429 and Linguistics 429.)


431 Highlights of French Civilization (3) Survey of French civilization from the Gauls to World War II. Historical events, daily life, all forms of arts. Prereq: 300-level literature course.

432 Contemporary French Culture (3) Current French cultural issues placed in historical perspective with comparative emphasis. Taught in English; readings in French for majors.

434 Literature of Quebec (3) Survey of literature of Quebec as well as French literature connected with North America. Readings include explorer and missionary works, such as Voyages of Champlain and Journals of Jesuits, and literature of contemporary Quebec. Prereq: 300-level literature course.

445 Advanced French for Business (3) Advanced contemporary French language and culture as relates to business transactions. Comparative approach to explore differences and similarities between francophone business culture(s) and those of North America and Japan. Building knowledge of business terminology while being sensitized to cultural differences and dangers of simplistic stereotyping. Prereq: French for Business or consent of instructor.

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

501 Techniques in Literary Analysis (3) Required for M.A. program. Close stylistic analysis of texts representative of different eras and of different genres. Development and improvement of student’s written French.

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses University facilities and resources. Required of all M.A. and Ph.D. students holding Graduate Teaching Assistantships, except those whose previous training or experience warrants their being excused by department.

515 Technology Enhanced Language Learning (3) Introduction to TELL. Overview of existing software, programs, and professional literature on topic. Hands-on development of instructional Web site for teaching language, culture, or literature.

519 Bibliography and Methods of Research (3) Critical research tools and scholarly contributions in French literature and language. Practical exercises on compiling of scholarly data using computer-based and non-computer sources.

520 French and Francophone Film (3) French and Francophone cinema from earliest days through New Wave directors. Prereq: 300-level literature course. May apply toward major. (Same as Cinema Studies 420).

523 Professional Writing (3) Writing for the workplace. Taught in English; reading and writing in French.

530 French and Francophone Theater (3) Changing approaches to French and Francophone theater.

540 French Literature and Culture I (3) Literary and cultural heritage of French Middle Ages.

550 French Literature and Culture II (3) Literary and cultural heritage of 16th- and 17th-century France.

560 French Literature and Culture III (3) Literary and cultural heritage of 18th- and 19th-century France.

570 French and Francophone Literature and Culture I (3) Literary and cultural heritage of France and other Francophone countries in first part of 20th century.

573 French and Francophone Literature and Culture II (3) Literary and cultural heritage of France and other Francophone countries from late 20th century to present.


584 Modern Theory and Criticism (3) Survey of twentieth century critical theory, including psychoanalysis, Marxism, structuralism and more.
German

GRADUATE COURSES

331-32 Elements of German for Upper-Division and Graduate Students (3,3) Elements of language, elementary and advanced readings, and a final 10,000 word translation project. Open to graduate students preparing for language examinations, and upper-division students desiring reading knowledge of the language. No credit for students having completed 101-02. 332 may be repeated. Maximum 6 hrs. Undergraduate credit only.

411-12 Advanced Conversation and Composition (3,3) Prereq: 311-12 or equivalent or consent of department. Maximum 6 hrs.

415 Special Topics (3) Topics vary. May be repeated. Maximum 6 hrs.

420 Selected Topics in German Literature from 1750 to the Present (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

421 German Lyric Poetry (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

422 German Drama (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

423 German Narrative Prose (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

424 German Literary Movements (3) Survey of major periods in development of German literature since 1750: problems and pitfalls of periodization.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, Spanish 425, and Linguistics 425.)

426 Methods of Historical Linguistics (3) Phonetics, distinctive feature analysis, sound change types, nature of sound change, principles of reconstruction, and fundamental assumptions about language change through time. Survey of non-phonological linguistic change, language families, Proto-Indo-European, and other proto languages. Prereq: 6 hrs of upper division foreign language courses (excluding courses in translation or graduate reading courses). (Same as French 426, Spanish 426, and Linguistics 426.)

435 Structure of the German Language (3) Contrastive English-German segmental and suprasegmental phonemes, contrastive English-German linguistic structures, selected topics in advanced German grammar and syntactic analysis. Prereq: 6 hrs of upper division foreign language courses (excluding courses in translation and graduate reading courses). (Same as Linguistics 435.)

436 History of the German Language (3) Development of German language from Indo-European through Proto-Germanic, Old High German, Middle High German to New High German. Internal and external linguistic history of German speech. Prereq: 6 hrs of upper division foreign language courses (excluding courses in translation or graduate reading courses). (Same as Linguistics 436.)

485 Business German (3) Survey of German used in fields of business, government, administration, and economics. Prereq: 6 hrs of upper-division German excluding courses in translation and graduate reading courses.

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

502 Registration for Use of Facilities (1-15) 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 German Phonetics and Advanced Grammar (3) Advanced work in phonetics, pronunciation, and selected topics in German grammar. For teachers and prospective teachers. Prereq: Consent of instructor.

512 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and foreign language skills, and cultural knowledge through seminars, demonstrations, peer teaching, and observation of foreign language classes. Required of all M.A. and Ph.D. students holding GTA's, except those whose previous training or experience warrants excuse by department.

519 Bibliographical Methods (1) Bibliographical methods, major reference works and bibliographical problems in language and literature.

520 Proseminar (2) Advanced training in use of bibliographical and reference tools; illustrative problems; paper preparation.

541 Medieval German Language and Literature (3) Introduction to Middle High German.

550 Studies in German Literature (3) Content varies. May be repeated. Maximum 6 hrs.

552 German Enlightenment, Rococo, and Sturm und Drang (3) Content varies. May be repeated. Maximum 6 hrs.

553 German Classicism and Romanticism (3) Content varies. May be repeated. Maximum 6 hrs.

554 German Realism and Naturalism (3) Content varies. May be repeated. Maximum 6 hrs.

555 Modern German Literature 1890-1945 (3) Content varies. May be repeated. Maximum 6 hrs.

556 Modern German Literature 1945-Present (3) Content varies. May be repeated. Maximum 6 hrs.

560 German Literary Theory and Criticism (3)

561-62 Directed Readings in German Language and Literature (3,3)

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.

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 Pulci to Tasso, Quattrocento and Cinquecento. Prereq: 212 or consent of instructor.

405 Modern Italian Poetry (3) From Pascoli to Montale. Prereq: Italian 212 or consent of instructor.

406 The Modern Italian Novel (3) From Manzoni to Calvino. 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 into film. Investigation of relationship between literature and cinema and achievement of greater understanding of Italian culture since 1930. Films in Italian with English subtitles. May be repeated. Maximum 6 hrs. (Same as Cinema Studies 421.)

510 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.

Russian

GRADUATE COURSES

401-02 Advanced Grammar, Conversation, and Composition (3,3) Prereq: Russian Composition and Conversation or equivalent.

430 Selected Topics in Russian Literature (3) Content varies. May be repeated. Maximum 9 hrs.

451-52 Senior Seminar (3,3) For majors in Russian; minors admitted at discretion of instructor. Intensive study of language, literary style, and literary criticism based on selected major novels.

510 Russian Phonetics and Advanced Grammar (3) Phonetics, pronunciation, stylistics, and selected topics in Russian grammar. For teachers and prospective teachers. Prereq: Consent of instructor.

550 Studies in Russian Literature (3) Content varies. 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.
Spanish

GRADUATE COURSES

421 Phonetics (3) Prereq: Intermediate Conversation and Composition or consent of instructor.


423 Advanced Composition and Conversation (3) Development of writing and speaking skills at advanced level, wide range of topics and situations. Variety of in-class and extra-class activities. Not available for credit for students whose level of proficiency in Spanish is superior as defined by the ACTFL Proficiency Guidelines or for graduate students in the Spanish M.A. or Ph.D. programs. Prereq: 323 Intermediate Composition and Grammar.

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.)

430 Topics in Hispanic Linguistics (3) Spanish language through different areas of linguistics: phonology, morphology, syntax, semantics, sociolinguistics, dialectology and second language acquisition. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, 333 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department. (Same as Linguistics 431.)

433 Images of Woman in Hispanic Literature (3) Major Hispanic texts (and/or women authors) in light of relation of femaleness to particular cultural context, role of women in society, patriarchal tradition, woman as cultural and as aesthetic value ("the feminine symbolic"), and feminist theoretical issues. Prereq: 323 Intermediate Composition and Grammar, 330 Textual Analysis and completion of 9 additional hours of upper division Spanish.

434 Hispanic Culture through Film (3) Analysis of selected cultural structures. Not available to native or bilingual students of Spanish without consent of department. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, 333 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. Taught in Spanish. May be repeated. Maximum 6 hrs with consent of department. (Same as Cinema Studies 434.)

461 Special Topics (3) Aspects of Hispanic literature, culture, linguistics, or foreign language pedagogy. Topics vary. May be repeated with consent of department. Maximum 6 hrs.

465 Latin American Film and Culture (3) Latin American and Latino/a's films and videos from 1900s to present as way of understanding life, culture, and artistic traditions in the Hispanic world: exploration of ideological, philosophical, social, and political implications of films and comparison of them with treatments of related subjects in other types of artistic production. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, 333 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. Taught in Spanish. May be repeated. Maximum 6 hrs with consent of department. (Same as Cinema Studies 465 and Cinema Studies 465.)

479 Disenchedted Texts in Hispanic Literature (3) Texts representing trends and periods of renewal in Spanish American literature and its influence social and cultural evolution of Hispanic world, including literature itself. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department. (Same as Latin American Studies 479.)

480 Social Forces in Hispanic Literary Expression (3) Analysis of major Hispanic texts that address factors and events that influenced and/or continue to influence social and cultural evolution of Hispanic world, including literature itself. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.

482 Trends in Hispanic Thought (3) Intellectual/philosophical currents represented in literary works, selected thinkers and movements from historical periods of Spain and Latin American countries. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.

484 Race, Ethnicity, and Nation in Hispanic Literature (3) Close reading and analysis of literary texts that deal with issues of race and ethnicity in Hispanic world with regard to identity and concepts of nationhood. Topics: mestizaje; conceptual distinctions between race and ethnicity in Latin America; indigenismo; afrocentrism; cultural and political identity and empire; relations between Jews, Christians, and Moors in Spain. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.

486 Literary and Artistic Movements in the Hispanic World (3) Principal achievements and representative directions in literature of Spain and Latin American countries. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.

498 Literary and Artistic Movements in the Hispanic World (2) Principal achievements and representative directions in literature of Spain and Latin American countries. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.

500 Thesis (1-15) Maximum 6 hrs with consent of department.

550 Techniques of Literary Analysis and Research Methods (3) Theoretical and critical essays on various techniques of literary analysis. Exploration of bibliographical and research materials.

551 Special Topics in Spanish or Spanish American Literature (3) May be repeated. Maximum 6 hrs.

552 Directed Readings (3)

561 Spanish American Colonial Literature (3) From pre-Columbian era through 18th century. Reading and analysis of selected works from Colonial Spanish American period and their Continental sources. Indigenous texts and authors. Content varies. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.


571 Spanish American Narrative: Criollismo to 1850 (3) Critical study of major trends and movements that shaped Spanish American narrative during first half of 20th century. Content varies. May be repeated. Maximum 6 hrs with consent of department.

572 Spanish American Narrative: Boom to Present (3) Critical study of major trends and movements that established Spanish American narrative as influential force in world literature during second half of 20th century. Content varies. May be repeated. Maximum 6 hrs with consent of department.

573 Regional Approaches to Interpreting Spanish American Literature (3) Interpretation of Spanish-American literature taking into consideration regional differences, including such factors as race, geography, immigration, and economic development. Key regions include Mexico and Central America, Caribbean, Andean countries, and the Southern Cone. Course readings vary between specific regional perspectives and transregional one. Content varies. May be repeated. Maximum 6 hrs with consent of department.


576 Contemporary Spanish American Poetry (3) Critical study of major poets in Spanish America from sentiment, and Cervantes' legacy to subsequent literary periods. Content varies. May be repeated. Maximum 6 hrs with consent of department.

535 Golden Age Poetry (3) Garcilaso, Fray Luis de León, San Juan de la Cruz, Lope de Vega, Quevedo, and Gongora. Content varies. May be repeated. Maximum 6 hrs with consent of department.

537 Golden Age Drama (3) Major dramatists of period: Lope de Vega, Tirso de Molina, Ruiz de Alarcón, Guillén de Castro, Calderón de la Barca, Moreto, and Rojas Zorrilla.


541 19th-Century Spanish Prose (3) Costumbriismo, realism, and naturalism in the novel, short story, and essay as represented in major authors: Larra, Mesonero Romanos, Fernán Caballero, Alarcon, Valera, Palacio Valdés, Pereda, Galád, Pardo Bazán. Content varies. May be repeated. Maximum 6 hrs with consent of department.

542 20th-Century Spanish Literature: Generation of ‘98 through Civil War (3) Principal achievements and representative directions in literature of Spain through Civil War years.

543 20th-Century Spanish Literature: Post-Civil War through Present (3) Principal achievements and representative directions in literature of Spain from Post-Civil War period to present.

550 Techniques of Literary Analysis and Research Methods (3) Theoretical and critical essays on various techniques of literary analysis. Exploration of bibliographical and research materials.

551 Special Topics in Spanish or Spanish American Literature (3) May be repeated. Maximum 6 hrs.

552 Directed Readings (3)

561 Spanish American Colonial Literature (3) From pre-Columbian era through 18th century. Reading and analysis of selected works from Colonial Spanish American period and their Continental sources. Indigenous texts and authors. Content varies. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700-Present, and completion of 9 additional hours of upper division Spanish. May be repeated. Maximum 6 hrs with consent of department.


571 Spanish American Narrative: Criollismo to 1850 (3) Critical study of major trends and movements that shaped Spanish American narrative during first half of 20th century. Content varies. May be repeated. Maximum 6 hrs with consent of department.

572 Spanish American Narrative: Boom to Present (3) Critical study of major trends and movements that established Spanish American narrative as influential force in world literature during second half of 20th century. Content varies. May be repeated. Maximum 6 hrs with consent of department.

573 Regional Approaches to Interpreting Spanish American Literature (3) Interpretation of Spanish-American literature taking into consideration regional differences, including such factors as race, geography, immigration, and economic development. Key regions include Mexico and Central America, Caribbean, Andean countries, and the Southern Cone. Course readings vary between specific regional perspectives and transregional one. Content varies. May be repeated. Maximum 6 hrs with consent of department.
1950 to present. Content varies. May be repeated. Maximum 6 hrs with consent of department.

577 Contemporary Spanish American Theater (3) Reading and analysis of Spanish America’s major dramatic works published and performed since 1950. Content varies. May be repeated. Maximum 6 hrs with consent of department.


579 Spanish American Literary Criticism (3) Major works in which Spanish Americans have developed strategies to define, organize, and catalog literature throughout the continent. Critical approaches that surpass European and other non-Spanish American critical perspectives. Content varies. May be repeated. Maximum 6 hrs 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. Letter grade or S/NC.

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

621 Seminar in Spanish Literature (3) Topics vary in field of Peninsular literature. May be repeated with consent of department. Maximum 9 hrs.

631 Seminar in Spanish American Literature (3) Topics vary. May be repeated with consent of department. Maximum 9 hrs.

Music

(College of Arts and Sciences)

MAJOR DEGREES

Music ..................................................... M.M.

Roger L. Stephens, Director

Professors:

Bitzas, George C., M.M. ......................... Converse
Brock, John P., M.M. .......................... Alabama
Coker, J., M.A. ............................... Sam Houston
Combs, F. M., M.A. ............................. Missouri
Jacobs, K. A., D.M.A. .......................... Texas
MacMorrán, W. S., M.M. ...................... Wisconsin
McClelland, D. K., M.A. ....................... Columbia
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
Stephens, Roger L., M.M. ....................... East Carolina
Stutzenberger, D. R., D.M.A. ...................... Maryland

Associate Professors:

Adams, Fay, M.M. ............................... Tennessee
Baye, A. L., D.M.A. .............................. South Carolina
Binder, S. L., D.M. ............................... Florida State
Boling, M. E., M.M. ............................. Tennessee
Brown, Donald R., Hs.D. ........................
Brunell, D. E., D.M. .............................. Indiana
Carter, P. Z., M.M. ............................... Colorado
Davis, Dolly C., Ph.D. .......................... Iowa
Freeman, Carroll, M.P.A. ................... Oklahoma City
Gay, J. L., Ph.D. ............................... Columbia
Hough, Don, M.M. .............................. Tennessee
Leach, C., F., D.M. ............................. Northwestern
Murphy, B. A., Ph.D. ......................... Ohio State
Royse, David, Ph.D. ............................ Kent State
Searle, S. R., M.M. .............................. Tennessee
Smith, C., B.M. .............................. SUNY-Fredonia
Sperl, G. R., M.M. .............................. Indiana
Zelnovich, Matus, M.A. ........................ Lyv

Assistant Professors:

Baldwin, Wesley, D.M.A. ........................ Maryland
Haar, Paul, M.M. .............................. Kansas
Hawthorne, W., Ph.D. ........................... Cincinnati
Keathley, Elizabeth, Ph.D. ....................... SUNY (Stony Brook)
Powell, Edward, M.M. .......................... Cincinnati
Richter, Jorge, M.M. ............................ Andrews
Ryder, Donald, D.M.A. ........................ Iowa
Walters, Christy, D.M. .......................... Florida State
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 (with an optional emphasis in music technology), musicology, performance (organ, piano, strings, voice, winds, and 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 on the master’s level.

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 of 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.

The concentration in music education is designed for persons who hold a Bachelor’s degree in Music or Music Education and certification to teach music in the public schools. Both thesis and non-thesis options are available.

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.

550 Curriculum Development and Evaluation in Music Education (3) Principles of curriculum development applied to music education programs. Formulating objectives; construction of evaluation instruments; survey of appropriate literature. 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 appropriate for students in grades K-8. Singing, dancing, acting, costumes, 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

Prerequisite: By audition or consent of instructor.

502 Jazz-Saxophone Ensemble (1) May be repeated. Maximum 4 hrs.
Music General

GRADUATE COURSES

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

501 Graduate Recital (2) E

502 Registration for Use of Facilities (1-15) 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

510 Music Bibliography (3) Bibliographic methodol-ogy in music. F

511 Lecture Recital (2) E

520 Musical Styles (3) Elements of design and their role in definition of musical styles. Prereq: Consent of instructor.

521 Special Topics in Performance (1-3) Prereq: Consent of department head. E

540 Secondary Applied Music (1) May be taken by music majors desiring applied study on a 2nd or 3rd instrument. May be repeated for a maximum of 4 hours credit on each instrument. Admission by audition. Requires payment of Applied Music fee. E

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) Problems in conducting recitatives. Prereq: Consent of instructor. S/NC only.

584 Practicum for Instrumental Conductors (1) Intern experience in field other than area of major interest. S/NC only.

590 Advanced Instrumental Conducting (2) Physical techniques of conducting, study and analysis of scores, rehearsal techniques. Attention to individual problems. Requires applied music fee. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

595 Instrumental Conducting Performance (1) Preparation and judged performance of band or orchestral work(s). Prereq: Consent of instructor.

Music History

GRADUATE COURSES

410 Music History Genre (3) Topics vary. May be repeated. Maximum 6 hrs.

420 History of Opera Genre (3) Dramatic, vocal, and orchestral elements in opera of Italian, French, and German schools, 1600-present.

430 Symphonic Literature (3) Literature for orchestra from Baroque to present, evolution of symphony.

450 Composer Seminar (3) Life and works of single composer. Subjects vary.

460 Music Aesthetics (3) Nature of music and musical experience, sense perception and emotions, music, and role of artist in society. Aesthetic viewpoint of individuals and historical eras through selected writings.

480 Music in Christian Worship (3) Hymnody, liturgies, and liturgical music.

540 Music in the Renaissance (3) From 1400 to 1600. Mass, motet, chansons, madrigal, and other vocal and instrumental forms and genres.

550 Music in the Baroque Period (3) From c.1600 to 1750; rise of opera and oratorio, sacred and secular cantatas, instrumental forms, performance practice.

560 Music in the Classic Period (3) Evolution of classical style from pre-classic music to music of Haydn, Mozart, and early Beethoven.

570 Music in the Romantic Period (3) Nineteenth-century musical styles from Beethoven to post-romanticists.

580 Music in the Twentieth Century (3) From 1890, Debussy, to present, Stockhausen and others.

585 Topics in Music of the Americas (3) Topics vary.

590 Introduction to Ethnomusicology (3) Ethnomusicology as scholarly discipline. History, theories, and methodologies as applied to study of music in culture. Prereq: Music in World Culture or equivalent.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of department head.

595 Seminar in Ethnomusicology (3) Topics vary. Prereq: 590 and consent of instructor.

Music Jazz

GRADUATE COURSES

410 Advanced Improvisation (3) Further development of individual skills and solving individual problems in jazz improvisation. Prereq: 210 and 220.

420 Jazz Pedagogy (1) Methods and materials relating to teaching of jazz, designing and administering jazz programs, and rehearsal techniques for jazz ensembles. Prereq: Studio music and jazz major or consent of instructor.

520 Seminar in Jazz (3) Topic varies.
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 Theory with technology emphasis. Prereq: Consent of instructor.

550 Percussion (1-4)
551 Accompanying and Coaching (1-4)
555 Voice (1-4)
560 Violin (1-4)
565 Viola (1-4)
570 Cello (1-4)
575 String Bass (1-4)
576 Electric Bass (1-4)
579 Guitar (1-4)
580 Piano (1-4)
585 Harpsichord (1-4)
590 Organ (1-4)
594 Composition (1-3)
595 Composition with Electronic Media (1-3)
599 Improvisation (1-4)

Music Theory

GRADUATE COURSES

430-40 Counterpoint I, II (3,3) Study of species counterpoint in modal and tonal styles, works of Palestrina and J. S. Bach. Prereq: 210 Theory III and 230 Advanced Ear Training IV with grade C or higher. 440 - Prereq: 430 with grade C or higher.

450 Choral Arranging (2) Analysis of scores and writing of arrangements for choruses. Prereq: 210 Theory III and 240 Advanced Ear Training IV with grade C or higher, or consent of instructor.

520 Analytical Techniques (3) Analytical techniques, contemporary approaches. Tonal and neotonal 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) Study 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, Czechoslovakian, British, and American art songs. Graduate credit not available for students in vocal performance.

425 Functional Diction 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 literature for the youth church choir, non-vocal musical activities appropriate to various age groups as used in church music programs (e.g., Orff, handbells, rhythm activities, etc.).

510 Vocal Literature Seminar (3) Topics vary. May be repeated. Maximum 6 hrs.

520 Performance Techniques for Singers (1) Improvisation, movement, and basic techniques for dramatic vocal performance. Prereq: Vocal major or consent of instructor. May be repeated for credit. Maximum 2 hrs.

530 Opera Performance (2) Prereq: Consent of instructor. May be repeated. Maximum 4 hrs.

540 Opera Production (1-3) Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

550-60 Advanced Vocal Pedagogy I, II (2.2) 550- Study of vocal production, examination of different methods. 560- 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 technique; 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 DEGREES

Nuclear Engineering ..................... M.S., Ph.D.

H. L. Dodds, Head

Professors:
Dodds, H. L., PE, Ph.D. ..................... Tennessee
Kerlin, T. W. (Emeritus), Ph.D. .......... Tennessee
Miller, L. F., PE, Ph.D. .................... Texas A&M
Perez, R. B. (Emeritus), Ph.D. .......... Madrid
Stevens, P. N. (Emeritus), Ph.D. ....
Ph.D. ..................................... Northwestern
Townsend, L. W., Ph.D. ..................... Idaho
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
Pveye, R. E., PE, Ph.D. ..................... Tennessee
Ruggles, A. E., Ph.D. ..................... Rensselaer
Scott, T. H., PE, Ph.D. ................... Florida

Research Professors:
Mihalcoz, J. T., Ph.D. ................. Tennessee
Mynatt, F. R., Ph.D. ..................... Tennessee
Shannon, T. E., Ph.D. ................... Tennessee

Research Assistant Professors:
Gribok, Adrei, Ph.D. ...................... IPPE (Russia)

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 program focusing on fission energy or fusion energy, or a radiological engineering concentration, which prepares students for careers in the radiation safety field (health physics). Both programs are designed for graduates of accredited undergraduate programs in engineering, physics, chemistry, biology, or mathematics.

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 an introductory course in nuclear engineering. If such competencies do not exist, the student must take appropriate courses for undergraduate credit. In addition, students without a B.S. degree in nuclear engineering, or the equivalent, must take 431 (Radiation Protection) and 470 (Nuclear Reactor Theory I), both of which may be taken for graduate credit. The department head is the contact for all interested students, both those with nuclear engineering degrees and those from other disciplines. More detailed information about the Department of Nuclear Engineering is available on the web at http:// www.engr.utk.edu/nuclear/.

THE MASTER'S PROGRAM

A graduate program leading to the Master of Science degree is available to graduates of recognized undergraduate curricula as described above. Each applicant will be advised as to the necessary prerequisite courses before he/she enters the program.

The minimum requirements for the M.S. degree in nuclear engineering are:

1. A major consisting of 12 semester hours of graduate courses in nuclear engineering which must include at least one
of the following sequences: 511, 512, 521, 522, 551, 552, 571, 572, 581, 582.

2. A minor consisting 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.

4. One of the following three options for a culminating experience:
   a. A thesis project (6 hours of 500).
   b. Two to four engineering practice projects (6 hours of 598).
   c. One engineering practice project (3 hours of 598) plus 6 hours of additional nuclear engineering coursework.

Thus, options (a) and (b) result in a minimum total of 30 hours and option (c) results in a minimum total of 33 hours.

The determination of which option a student may undertake is made by the student’s graduate committee and is based on the student’s personal interests, academic background, and work experience, as well as the nature of projects currently available in the department.

A thesis project requires the student to conduct independent, in-depth research. An engineering practice project is similar to a thesis project but smaller in scope, and can be research, design, product development, special operations, or a critical review of published literature in a specific technical area. The student must submit a brief written proposal for each project undertaken, either thesis or engineering practice, which must be approved by the student’s graduate committee. The final report for an engineering practice project is normally prepared in thesis format (i.e., according to the UT Knoxville Guide to the Preparation of Theses and Dissertations); however, another formal report format may be used if approved by the student’s graduate committee. The student must also register for the appropriate number of hours of either 500 or 598, as specified by the student’s major professor, during each semester that work is performed on a thesis or engineering practice project. Finally, the student must pass an oral examination on all work presented for the degree—all coursework and the dissertation.

CERTIFICATE IN MAINTENANCE AND RELIABILITY ENGINEERING

The College of Engineering offers a certificate program in maintenance and reliability engineering. The program is designed primarily for part-time students in that all of the courses are available through distance education (see http://www.anywhere.tennessee.edu/ne/default.htm).

The 12-credit certificate is earned by completing 483 and 484, which are cross-listed among all participating departments in the College of Engineering, plus two elective courses selected from a list of courses provided by the participating departments. Currently, the available elective courses are Industrial Engineering 516 and 591, Mechanical Engineering 534 and 599, and Nuclear Engineering 579 and 585. The selection of elective courses is determined through an advising conference with each individual student, and is based on the student’s personal interests, academic background, and work experience. All course-exists must meet the minimum criteria established by the Graduate Council.

CERTIFICATE IN NUCLEAR CRITICALITY SAFETY

The Department of Nuclear Engineering offers a certificate program in nuclear criticality safety. The program is designed primarily for part-time students in that all of the courses are available through distance education (see http://www.anywhere.tennessee.edu/ne/default.htm).

The 12-credit certificate is earned by completing 421, 543, and 592 plus one of the following three courses: 470, 571, or 581. The selection of one of the latter three courses is determined through an advising conference with each individual student, and is based on the student’s personal interests, academic background, and work experience.

The 12-credit certificate is earned by completing 421, 543, and 592 plus one of the following three courses: 470, 571, or 581. The selection of one of the latter three courses is determined through an advising conference with each individual student, and is based on the student’s personal interests, academic background, and work experience.

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 Nuclear Engineering is available to residents of the states of Arkansas, Mississippi, or South Carolina. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

GRADUATE CREDIT FOR UNDERGRADUATE COURSES

400-level courses in nuclear engineering may be used for graduate credit. However, at least two-thirds of the minimum required hours in the M.S. 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 neutrons, shielding, dynamics and controls, alpha and beta spectrum, 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 radiological 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 shield design, discrete ordinates, and Monte Carlo. Prereq: Physics 232.

421 Introduction to Nuclear Criticality Safety (3) Fundamentals of nuclear criticality safety; criticality accidents; safety standards; overview of experimental, computational, methods, and applications. Prereq: 301 Fundamentals of Nuclear/Radiological 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.

Topics relative to
Introduction to time domain and frequency domain
control problems.

541 Reactor Fuel Management (3)
Principles of methodology, techniques, modeling, and management maintenance. Information extraction from machinery measurements, rotating machine diagnostics, nondestructive testing, life prediction, failure models, lubrication oil analysis, establishing predictive maintenance program, and computerized maintenance management systems. Prerequisite: Senior standing or consent of instructor. (Same as Chemical Engineering 483, Industrial Engineering 483, and Mechanical Engineering 483.)

484 Introduction to Maintenance Engineering (3)
Principles of methodology, techniques, modeling, and management maintenance. Information extraction from machinery measurements, rotating machine diagnostics, nondestructive testing, life prediction, failure models, lubrication oil analysis, establishing predictive maintenance program, and computerized maintenance management systems. Prerequisite: Senior standing in engineering and consent of instructor.

500 Thesis (1-15)
May be repeated. S/N only. E

511-12 Transport Processes in Nuclear Engineering (3,3)
Rheology of newtonian and non-newtonian fluids; integral and system conservation equations for single and multi-component fluids; in-depth development of differential conservation equations for mass, 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 analysis of fluid flow and heat transfer.

522 Experimental Methods in Reactor Dynamics (3)
Introduction to time domain and frequency domain control problems. Investigation of new developments and practice. Prerequisite: Senior standing and consent of instructor. May be repeated. S/N only. E

541 Reactor Fuel Management (3)
Topics relative to in-core fuel management. Applicable topics in reactor physics, fuel depletion, isotopic inventories, reactivity control and numerical methods. Prerequisite: 470 or consent of instructor.

542 Management of Radioactive Materials (3)
Technology for processing, treatment, handling and storage of radioactive nuclides. Analytical and numerical methods for evaluating environmental impact of radioactive materials and control analysis and interpretation of process signals for reactor surveillance and diagnostics. Introduction to time-series modeling. Prerequisite: 521.

551 Radiation Protection (3)

552 Radiological Assessment and Dosimetry (3)
Transport of radioclines in environment, food chain pathways, internal dosimetry and personnel dosimetry. Prerequisite: 551 or consent of instructor.

553 Radiation Risk Analysis (3)
Methods for radiation risk prediction, survival analysis, parameter estimation, real data analysis, extrapolation techniques. Prerequisite: 552 or consent of instructor.

567 Radiation Therapy I (3)
Irradiation ionization in radiation therapy to cause controlled biological effects in cancer patients. Physics of interaction of various radiation modalities with body equivalent materials and physical aspects of clinical applications. Lecture and lab. Prerequisite: Consent of instructor.

568 Radiation Therapy II (3)
Physics of ionizing radiation therapy with emphasis on quality assurance, treatment planning, radiation protection, and special topics. Prerequisite: 567 or consent of instructor.

571 Reactor Theory and Design (3)
Analytical and numerical techniques for neutronics modeling of nuclear systems. Forward and adjoint Boltzmann transport equation. Multigroup diffusion theory. Core analysis methods and codes. Prerequisite: 470 or consent of instructor.

572 Nuclear System Design (3)
Design and analysis of a nuclear system, interface with non-nuclear aspects of system design; system reliability and economics; class project. Prerequisite: Consent of instructor.

576 Expert Systems in Engineering (3)
Application of expert systems in engineering: logic and rationale, developing expert systems, programming, advanced topics. Prerequisite: 576 or consent of instructor. (Same as Mechanical Engineering 576 and Engineering Science 576.)

577 Neural Networks in Engineering (3)

578 Fuzzy Systems in Engineering (3)
Fuzzy numbers, fuzzy environments, radius of uncertainty, approximate reasoning, fuzzy models and structures, decision process in fuzzy environment, fuzzy logic computing, fuzzy logic controllers, fuzzy expert systems and other engineering applications. (Same as Engineering Science 578.)

579 Advanced Monitoring and Diagnostic Techniques (3)
Fundamentals of machinery monitoring and diagnostics and application of advanced statistical and artificial intelligence based techniques such as ridge regression, principal component analysis (PCA), linear and non-linear partial least squares (PLS), neural networks, and fuzzy logic. Prerequisite: Graduate standing or consent of instructor.

581 Reactor Shielding (3)
Application of analytic/deterministic solutions of Boltzmann transport equations to shield design problems. Spherical harmonics moments method, discrete ordinates, adjoint calculations, coupled analysis, and fast reactor shield design. Prerequisite: 406 or equivalent.

582 Monte Carlo Analysis (3)
Analysis of radiation transport problems in radiation shielding by Monte Carlo method, use of MCNP code system. Random sampling, evaluation of integrals, analog particle transport, techniques of variance reduction, forward and adjoint modes of analysis, importance function biasing, and weight window survival biasing and contribution calculations. Prerequisite: Consent of instructor.

585 Process System Reliability and Safety (3)
Qualitative and quantitative techniques for assessing and improving process systems reliability and safety. Fault tree analysis and associated dependent fault analysis. Prerequisite: Consent of instructor. (Same as Chemical Engineering 585.)

597 Special Topics in Nuclear Engineering (3)
Lectures and recitation on recent advances in nuclear engineering. Prerequisite: Consent of instructor. May be repeated with consent of department.

598 Nuclear Engineering Practice (3-9)
Experience in solving and reporting on engineering problems. Prerequisite: Approval of department. May be repeated. Enrollment limited to alternative plan students. S/N only.

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

611-12 Selected Topics in Reactor Theory (3,3)
Transport theory, control rod theory, stochastic methods. Selected topics from literature. Prerequisite: 572.

621 Selected Topics in Radiation Protection (3)
Prerequisite: 551, 552. May be repeated with consent of department.

653 Theory of Information Processing (3) Modern system theoretical methods for evaluating system performance from dynamic measurements. Prerequisite: 522 or equivalent.

671 Advanced Topics in Applied Artificial Intelligence (3) Recent advances in engineering applications of artificial intelligence. Prerequisite: 577. (Same as Mechanical Engineering 671 and Engineering Science 671.)

687 Special Topics in Nuclear Engineering (3) Investigation of new developments. Prerequisite: Consent of instructor.
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, nurse anesthesia, 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 achievement of optimal health in the dynamic health care system. The program prepares advanced practice nurses for a career in adult health nursing, nursing of women and children, mental health nursing, and nurse anesthesia 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 graduate study.
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. Applicants for nurse anesthesia require an interview.
5. Hold a Bachelor’s degree in Nursing (BSN) from an accredited program.
   a. Hold or be eligible for licensure to practice nursing in Tennessee.
   b. Have an undergraduate GPA of 3.0 or higher on a 4-point scale, or a GPA of 3.3 for courses in the undergraduate major.
   c. Have completed a health assessment and physiology course within the past five years.
   d. Have completed 3 hours of graduate level statistics.

OR

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.
   c. This option not available to nurse anesthesia or nurse administration students.

6. 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 terms 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 rubeola 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, nutrition, 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 interest-ed students and is especially encouraged for those who are considering pursuit of doctoral degrees sometime 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 36 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 (not required for nurse anesthesia students) 3

Required for nurse anesthesia students:

506 Advanced Anesthesia Pharmacology 3
516 Advanced Pathophysiology: Neurological and Cardiovascular with Anesthesia Implications 2
517 Advanced Pathophysiology: Respiratory/Renal with Anesthesia Implications 2
518 Advanced Pathophysiology: Obstetrics/Regional Anesthesia 2
521 Basics of Nurse Anesthesia 6
522 Integrated Health Science for Anesthesia 3
523 Advanced Principles of Nurse Anesthesia Practice 2

Research (6-9 credits)

501 Nursing Research: Methods, Design & Analysis 3
500 Thesis 6

OR

582 Scholarly Inquiry for Advanced Practice Nursing 3

Elective (9 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 undergraduate courses in addition to meeting the requirements listed above:

311 Foundations of Professional Nursing Practice 5
319 Pathophysiology of Health Deviations 4
333 Health Assessment 3
341 Health Promotion 3
351 Pharmacology I 2
361 Health Maintenance & Restoration across the Life Span 5
381 Professional Leadership Issues I 2
382 Health Promotion & Maintenance in the Community 4
406 Pharmacology II 2
415 Family/Community Health Nursing 6
421 Health Maintenance & Restoration in Mental Health 4
451 Professional Leadership Issues II 2
461 Health Restoration across the Life Span 5
482 Health Promotion, Maintenance & Restoration in the Community 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, 382, 452, 482 and 490 and complete or successfully challenge the following:

311 Foundations of Professional Nursing Practice 5
319 Pathophysiology of Health Deviations 4
333 Health Assessment 3
351 Pharmacology I 2
361 Health Maintenance & Restoration across the Life Span 5
403 Health Promotion & Maintenance in Childbearing Families 5
406 Pharmacology II 2
421 Health Maintenance & Restoration in Mental Health 4
451 Professional Leadership Issues II 2
461 Health Restoration across the Life Span 5

A total of 19 credits can be obtained by successful completion of the NLN ACE Examination. See undergraduate catalog for other challenge options. RN’s 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 417.
Final Examination Requirements
All students must successfully complete a final examination as required by the Graduate Council. 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 roles as researchers, educators, and/or administrators. Specifically, the graduate of this program should be able to:
1. Analyze, test, refine, and expand the theoretical basis of nursing.
2. Conduct research that generates knowledge and advances nursing as a discipline.
3. Provide leadership as nurse scientists who can function in a variety of roles and settings.
4. Collaborate with members of other disciplines in health-related research.
5. Develop, implement, evaluate, and recommend health care policy.
6. Demonstrate professionalism, advocacy, ethical principles and scientific integrity.

Admission Requirements
1. Meet requirements for admission to graduate study.
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 formal program of doctoral degree requirements.
3. Have a minimum cumulative graduate 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 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 Office of Graduate Admissions. Submit three Graduate 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.
12. 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:
601 Nursing Knowledge Development 3
602 Theory Analysis & Construction 3
603 Research and Inquiry 3
605 Middle-Range Theoretical Formulations for Nursing Science Development 3
606 Nursing Research Seminar 3
607 Qualitative Nursing Research 3
608 Quantitative Nursing Research 3
609 Research Practicum* 2
610 Nursing Science Seminar 2
611 Advanced Nursing Seminar 2
612 Health and Nursing Policy/Planning 3
613 Nursing Leadership in Complex Systems 3
---- Inferential Statistics 3
---- Multivariate Statistics 3
---- Cognates 6
---- Elective 3
600 Dissertation 24
TOTAL 72

*Note: 1 hour per semester must be taken for 2 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 representa-

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 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 FAMIL

POST-MASTER'S CERTIFICATE IN MENTAL HEALTH NURSING
The College of Nursing offers a post-master's certificate program for nurses who need additional training in mental health nursing. Required for admission is a master's degree in nursing.

Course requirements are 530, 531, and 583, plus additional hours as determined by the college. The total hours will vary depending on the student's academic record, clinical experience and objectives. Students must complete a minimum of 12 credits. Typically students will complete 16-20 hours of course credit.

POST-MASTER'S CERTIFICATE IN MENTAL HEALTH
The College of Nursing offers a post-master's certificate program for nurses who need additional training in mental health nursing. Required for admission is a master's degree in nursing.

Course requirements are 560 and 561, plus additional hours as determined by the college. The total hours will vary depending on the student's academic record, clinical experience and objectives. Students must complete a minimum of 12 credits. Typically students will complete 16-20 hours of course credit.
POST-MASTER’S CERTIFICATE IN NURSE ANESTHESIA

The College of Nursing offers a post-master’s certificate program for nurses who possess a master’s degree in nursing and desire to become Nurse Anesthetists. In addition to the general requirements for admission to graduate study and the College of Nursing, the following are required of all nurse anesthesia certificate applicants:

1. A minimum of 12 credits in critical care experience with adult clients.
2. Certification in Advanced Cardiac Life Support (ACLS) and Pediatric Advanced Life Support (PALS).
3. A personal interview.

Course requirements are 506, 517, 518, 521, 522, 523 of nurse anesthesia didactic content, plus additional hours as determined by the college and 54 hours of nurse anesthesia clinical practice courses, 544, 545, 546, 547, 548, 549, 583. The total hours will vary depending on the student’s academic record, clinical experience and objectives. Although students must complete a minimum of 12 credits, typically, students who have completed a master’s degree in nursing within the preceding five years will complete 64-70 hours of course credit.

POST-MASTER’S CERTIFICATE IN NURSING ADMINISTRATION

The College of Nursing offers a post-master’s certificate program for nurses who need additional training in nursing administration. Required for admission is a master’s degree in nursing.

Course requirements are 590 and 591, plus additional hours as determined by the college. The total hours will vary depending on the student’s academic record, clinical experience and objectives. Students must complete a minimum of 12 credits. Typically students will complete 16-20 hours of course credit.

POST-MASTER’S CERTIFICATE IN NURSING OF WOMEN AND CHILDREN

The College of Nursing offers a post-master’s certificate program for nurses who need additional training in nursing of women and children. Required for admission is a master’s degree in nursing.

Course requirements are 550 and 551, plus additional hours as determined by the college. The total hours will vary depending on the student’s academic record, clinical experience and objectives. Students must complete a minimum of 12 credits. Typically students will complete 16-20 hours of course credit.

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 Arkansas. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

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 of research in nursing; critical evaluation of nursing and health-related research. Prereq or coreq: Graduate level statistics. E

502 Registration for Use of Facilities (1-15) 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 Health Promotion in Advanced Practice Nursing (3) Principles of health promotion, education, and innovative strategies for achieving wellness of individuals, families, groups, and communities. Prereq: Admission to MSN program or consent of instructor.

504 Advanced Health/Physical Assessment (3) Development of advanced clinical reasoning and assessment skills to determine client health status and needs. Application of physiological, pathophysiologic, and psychosocial concepts with implications for advanced practice nursing. Prereq: Admission to MSN program or consent of instructor. Didactic (2.5) and lab (.5).

505 Advanced Clinical Pharmacology (3) Pharmacological agents utilized to treat common, recurrent health problems (contraindications and side effects), and interactive effects of commonly prescribed drugs. Prereq: Undergraduate pharmacology course or consent of instructor. F


509 Graduate Seminar in Public Health (1) (Same as Public Health 509, Exercise Science 509, Nutrition 509, and Social Work 509.)

510 Theoretical Foundations of Nursing (3) Historical evolution of nursing science; nursing’s metaparadigm and selected philosophies, conceptual models and theories as structures which guide critical thinking in analysis, reasoning, and decision making for advanced practice. Prereq: Admission to MSN program or consent of instructor. F

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 physiologic and pathophysiologic concepts, principles, and theories applied to deviations of human systems. Prereq: Undergraduate pathophysiologic course. Sp

516 Advanced Pathophysiology: Neurological/Cardiovascular with Anesthesia Implications (2) Review of anatomy and physiology and integration of pathophysiologic relevant to patients requiring anesthetic care for cardiac, surgical procedures (both children and adults) with and without cardiopulmonary bypass, intracranial surgical procedures for vascular and/or mass occupying lesions, patients requiring somatosensory evoked potential monitoring, and patients requiring anesthesia for noncardiac and non-neurological procedures who present with either neurological and/or cardiovascular comorbidity. Prereq: 521. Coreq: 523.

517 Advanced Pathophysiology: Respiratory/Neu- ronal with Anesthesia Implications (2) Review of anatomy and integration of pathophysiologic relevant to patients in need of regional anesthesia for patients who present with either neurological and/or respiratory pathologies. Prereq: 516. Coreq: 523.

518 Advanced Pathophysiology: Obstetric/Regional Anesthesia (2) Review of anatomy and physiology and integration of pathophysiologic relevant to patients in need of regional anesthesia for patients who present with either neurological and/or respiratory pathologies. Prereq: 516. Coreq: 523.

520 Advanced Practice Nursing and Health Delivery Systems (3) Nursing’s role in dynamic health care system: health policy and organizational, social, ethical, legal, political, economic and technological factors which impact advanced practice nursing and delivery of health care. Prereq: Admission to MSN program or consent of instructor.


522 Integrated Health Science for Anesthesia (3) Fundamental principles of chemistry and physics as related to advanced practice of anesthesia. Prereq or coreq: 464, 504, 505, 583. Coreq: 521.


530 Adult Health Nursing I (6) Advanced nursing practice for health promotion, restoration, and maintenance of young, middle-aged, and older adults. Theories and research to advance practice with individual clients in variety of settings. Prereq: 504, 505, 515. Prereq or coreq: 531, 530, 520. Didactic (2) and practicum (4). Sp

531 Adult Health Nursing II (6) Continuation of 530. Delivery, provision, and management of health care for adult groups and communities. Prereq: 530, 501. Prereq or coreq: 582, 583 (gerontology students only). Didactic (2) and practicum (4). F


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 variety of settings. Health promotion and nursing interventions for actual or potential health problems of women, children, and families. Prereq: 504, 505, 515. Prereq or coreq: 503, 510, 520. Didactic (3) 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, 501, 500, 520. 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, 510, 520. F

558 Nurse Midwifery Seminar II (1) Exploration of psychological, developmental, and sociocultural theories as related to individual and family patterns of illness and wellness. Exploration of midwifery in advanced practice promoting optimal wellness within clients and community. Prereq: 501, 510, 570. Coreq: 520. Sp
Nutrition

(College of Human Ecology)

MAJORS                DEGREES

Human Ecology  ................. Ph.D.  Nutrition  ..................... M.S., M.S.-M.P.H.

Michael B. Zemel, Head

Professors:
  Beacheune, Roy E. (Emeritus), Ph.D.  .............. Kansas State
  Carpenter, Betty R. (Emeritus), Ph.D.  ......... Illinois
  Chencharick, Judith (Memphis), Ph.D.  ... Washington, D.C.
  Dian, D. E. (Emeritus), M.D.  .......... Oregon State
  Knapp, David G., M.D.  ............... Iowa State
  Orlando, M. A. (Philadelphia)  .......... Virginia Commonwealth
  Rhodes, W. E. (Emeritus), Ph.D.  ......... Pennsylvania State
  Whelan, Jay, Ph.D.  .................. Penn State

Zemel, Michael (Laisio), Ph.D.  .............. Wisconsin

Associate Professors:
  Bailey, James W., Ph.D.  .............. Iowa State
  Burney, Janie, Ph.D.  ............... Tennessee
  Greer, Betty P., M.A.  .............. Tennessee
  Haughton, B., Ed.D.  ............... Columbia
  Karlstad, Michael, Ph.D.  ............ Loyola
  Moussa, Naima, Ph.D.  .............. Paris

Assistant Professors:
  Bittle, Joyce (Memphis), Ph.D.  ............... Tennessee
  Chencharick, Judith (Memphis), Ed.D.  ............ Memphis
  Kim, Jun-Han, Ph.D.  ............... Tennessee
  Truett, Gary, Ph.D.  .............. Georgia

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 in nutrition science or graduate degree in public health can lead to eligibility for the Registration Examination to become a Registered Dietitian (R.D.).

ADMISSION REQUIREMENTS

A complete file for review includes the Graduate Application for Admission file, completed departmental application form, Graduate Record Exam (GRE) scores for the general section, and three Graduate Rating Forms completed by individuals who can attest to the applicant’s potential for graduate study. Forms may be obtained from the Department's Office, 229 Jessie Harris Building, University of Tennessee, Knoxville, 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 applicant a strong background in nutrition science and an introduction to public health. Six hours of research courses are required for admission to the graduate program. The program consists of a minimum of 33 hours with at least 16 hours of coursework in the department. NTR 511, 512, 540, and 541 and 3 hours of graduate level statistics are required. Students in public health nutrition must take NTR 511, 512, 513, 514, 515, and the three hours of statistics. Six hours of Thesis 500 and 6 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 20 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 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 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 and the perspective of the 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 Safety Sciences (PH 508), two credits of Seminar in Public Health (PH 509), 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 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).

**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 a changing environment. 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 GTAs and NTR 548 comprising a faculty-supervised problem in college teaching.

**MINOR IN NUTRITION**

The graduate minor consists of Nutrition 511 and 512 plus at least three hours from any letter-graded 500-level or above nutrition courses.

**GRADUATE COURSES**

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when students 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

508 Culture, Food, and Nutrition (3) Food-related behavior of individuals and groups in United States, sociocultural, economic, and technological influences. Nutrition and public policy. Prereq: Advanced Nutrition or consent of instructor. F, A

509 Graduate Seminar in Public Health (1) (Same as Public Health 509, Exercise Science 509, Nursing 509 and Social Work 509.)

511 Advanced Physiological Chemistry (4) Bioenergetics, flux control and hormonal interrelationsh-ips. Prereq: Advanced Nutrition or equivalent. F


513 Community Nutrition I (3) Orientation to com-munity help services, public health practice, nutrition issues, needs, and resources; functional roles of public health nutritionists. Concurrent field experiences. Prereq: Advanced Nu-trition or consent of instructor. F

514 Community Nutrition II (3) Planning, implementa-tion, and evaluation of public health nutrition pro-grams. 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 programs. Location of in-depth study to be selected in consultation with instruc-tor. Prereq: 513, 514 and consent of instructor. S/NC only. Su

516 Maternal and Child Nutrition (3) Nutrition prin-ciples related to growth and development during preg-nancy, infancy, and childhood to age 5, high risk conditions. Prereq: Advanced Nutrition or consent of instructor. F

517 Childhood and Adolescent Nutrition (3) Applica-tion 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; af-fects of nutrition on biological aging. Prereq: Advanced Nutrition or consent of instructor. Su

520 Nutritional Ecology (2) Examination of issues in natural, physical, and social environments that impact availability of food and nutrients in U.S. food supply. F, A

521 Physiological Basis for Diet and Disease (3) Altered nutrient needs as result of metabolic changes that occur with aging. Prereq: Nutrition 1 or consent of instructor. 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


530 Molecular Application in Nutrient-Gene Inter-action I (1) Theories and applications of gene regulation methodologies. Experimentation with DNA and RNA. RNA and DNA isolation analysis to illustrate nutrient regulation of gene expression. Combination of lab/lecture. F

540 Seminar in Nutrition (1) May be repeated. S/NC only. E

541 Research Methods (2) Basic principles of plan-nin, conducting, and interpreting nutrition and foodservice systems research and preliminary research. Prereq: 6 graduate hrs in nutrition and food service adminis-tration and statistics. Sp

542 Advanced Experimental Nutrition (2) Applica-tion of research principles to individual project using experimental nutrition methods. Prereq: 541. Sp

544 Survey Methods in Food and Nutrition (2) Application of survey research methods to nutrition projects: assessment of food consumption, nutrient
Philosophy

(Procter College of Arts and Sciences)

MAJOR DEGREES

Philosophy ............................................., M.A., Ph.D.

John Hardwig, Head

Professors:

Aquila, Richard E., Ph.D. ............. Northwestern
Cebik, L. B. (Emeritus), Ph.D. ......... Nebraska
Cohen, Sheldon M., Ph.D. ............. Northwestern
Davis, John W. (Emeritus), Ph.D. ...... Emory
Emory Edwards, Rem B. (Emeritus), Ph.D. .... Emory
Graber, Glenn C., Ph.D. ............... Michigan
Hardwig, John, Ph.D. ..................... Texas
Nolt, John E., Ph.D. ......................... Ohio State
Postow, Betsy C., Ph.D. ............... Yale
Van de Vate, Dwight, Jr. (Emeritus), Ph.D. ............... Yale

Associate Professors:

Bennett, James O., Ph.D. ............. Tulane
Bohstedt, Kathleen Emmett (Liaison).
Ph.D. ................................................. Ohio State
Hamlin, H. Phillips, Ph.D. ............. Georgia

Assistant Professors:

Kaplan, Jonathan M., Ph.D. ........... Stanford
McLeod, Carolyn W., Ph.D. ........... Dalhousie
Reidy, David A., Ph.D. ................. Kansas

The Department of Philosophy offers graduate study leading to the Master of Arts and Doctor of Philosophy. The M.A. program includes thesis and non-thesis options and offers a concentration in medical ethics and in religious studies. The Ph.D. program also has a concentration in medical ethics. Detailed information may be obtained from the Director of Graduate Studies in Philosophy.

THE MASTER'S PROGRAM

The department offers both a thesis and a non-thesis option. The course requirements for an M.A. with the thesis option include 6 hours in Philosophy 500. Of non-thesis hours, at least two-thirds must be in courses at or above the 500 level. No philosophy course numbered under 400 may be taken for graduate credit. There are no particular courses that M.A. students are required to take. The nature of the student’s coursework should be determined in consultation with the student’s faculty committee. The non-thesis M.A. requires 30 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 also pass a final written examination on all work offered for the degree. An additional oral examination may be required. As a part of the Master's degree, and in addition to a final comprehensive examination, a culminating (capstone) experience is expected. Examples of culminating experiences include presenting a paper at a refereed national or regional philosophy conference, or presenting 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. Thirty-three hours of coursework beyond the M.A. are required, of which 6 hours will be in courses numbered above 600. See the Philosophy Department Graduate Student Handbook 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.) This may be 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. Bi- 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 either the 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. program in Philosophy is available to residents of the states of Alabama, Delaware, or West Virginia; (concentration in medical ethics) Kentucky, Oklahoma, Texas, or Virginia; the Ph.D. program to residents of Alabama, Kentucky, Louisiana, Mississippi, Texas, Virginia or West Virginia. Additional information may be obtained from the Administrative Services Assistant in the Office of Graduate Admissions.

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)

419 Science as Method (3) (Same as Ecology and Evolutionary Biology 419 and Botany 419)

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.

441 Topics in Historical Philosophy (3) May be repeated when topic varies. May be counted toward major or minor.

446 Theoretical Issues in Medical Ethics (3) Prereq: 240 or 345 or consent of instructor.

452 Philosophy of Biology (3) Current issues: nature of natural 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 manage to be 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 6 hrs.

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

502 Registration for Use of Facilities (1-15) 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

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/N only. E

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.
Physics and Astronomy

(College of Arts and Sciences)

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<tr>
<th>MAJOR</th>
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<tr>
<td>Physics</td>
<td>M.S., Ph.D.</td>
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<td>Soren Sorensen, Head</td>
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Professors:

Barnes, F. E., Ph.D. .............. California  
Bingham, C. R., Ph.D. .............. Tennessee  
Blass, W. E., Ph.D. .............. Michigan State  
Breining, M., Ph.D. .............. Oregon  
Bugg, W. M., Ph.D. .............. Tennessee  
Calcott, T. A., Ph.D. .............. Purdue  
Childers, R. W., Ph.D. .............. Vanderbilt  
Crater, H. W. (UTSI), Ph.D. ........ Yale  
Eguluz, A. G., Ph.D. .............. Brown  
Elston, S. B., Ph.D. .............. Massachusetts  
Georgiou, S., Ph.D. .............. Manchester  
Guidry, M. W., Ph.D. .............. Tennessee  
Handler, T., Ph.D. .............. Rutgers  
Kamyshkov, I., Ph.D. ........ ITEP (Russia)  
Lewis, J. W. L. (Distinguished Prof.) (UTSI), Ph.D. ........ Mississippi  
Macek, J. (Distinguished Scientist), Ph.D. ........ Rensselaer  
Mahan, G. D. (Distinguished Scientist), Ph.D. ........ California  
Nazerewicz, W., Ph.D. .............. Warsaw  
Painter, L. R., Ph.D. .............. Tennessee  
Pegg, D. J., Ph.D. .............. New Hampshire  
Plummer, E. W. (Distinguished Scientist), Ph.D. ........ Cornell  
Quinn, J. J. (Willis Lincoln Chair of Excellence), Ph.D. ........ Maryland  
Riedinger, L. L., Ph.D. .............. Vanderbilt  
Shih, C. C. (Liaison), Ph.D. ........ Cornell  
Sorensen, S. P., Ph.D. .............. Copenhagen  
Strayer, M. R., Ph.D. .............. MIT  
Thompson, J. R., Ph.D. .............. Duke  
Ward, B. F. L., Ph.D. .............. Princeton  
Weltinger, H. H., Ph.D. ........ Groningen (Netherlands)  

Associate Professors:

Dai, P., Ph.D. .............. Missouri  
Davis, L. (UTSI), Ph.D. ........ Auckland  
Ferrell, T. L., Ph.D. .............. Clemson  
Levin, J. C., Ph.D. .............. Oregon  
Mandrus, D. G., Ph.D. ........ SUNY (Stony Brook)  
Parigier, C. (UTSI), Ph.D. ........ New Zealand  
Read, K. F., Ph.D. .............. Cornell  
Shieh, S. Y., Ph.D. .............. Maryland  
Siopsis, G., Ph.D. .............. Cal Tech  

Assistant Professors:

Daunt, S. J., Ph.D. .............. Queens  
Dean, D. J., Ph.D. .............. Vanderbilt  
Sanders, A. J., Ph.D. ........... Tufts  

Research Professors:

Pinnaduwage, L. A., Ph.D. ........ Pittsburgh  
Thonnard, N., Ph.D. .............. Kentucky  
Zhang, J. Y., Ph.D. .............. Lanzhou  

Research Associate Professor:

Datskos, P. E., Ph.D. .............. Tennessee  

Research Assistant Professors:

Efremenko, Y. Y., Ph.D. .......... ITEP(Russia)  
Yost, S. A., Ph.D. .......... Princeton  

Graduate programs leading to the Master of Science and Doctor of Philosophy are offered in a number of concentration areas: astrophysics; atomic, molecular, optical and low temperature physics; biophysics; chemical physics; condensed matter and surface physics; elementary particle physics; geophysics (Master’s only); health physics (Master’s only); mathematical and computational physics; nuclear and relativistic heavy ion 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 laser applications, quantum and applied optics, laser spectroscopy, fluid physics, medical physics, computational physics, and theoretical physics. For additional information, contact the department head.

ADMISSION REQUIREMENTS

A student who enrolls in graduate study 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 prerequisites 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.

In addition to meeting the Graduate Council’s minimum requirements, applicants are strongly encouraged to submit scores from the Graduate Record Examination (general and subject).

All first-year graduate students are required, for advising purposes only, to take a diagnostic examination in undergraduate physics during the fall semester registration period.

THE MASTER’S PROGRAM

Thesis Option

The course requirements include 24 semester hours of physics courses, of which at least 12 hours are taken from Physics 511-12 or 513-14, 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.

The department offers an M.S. thesis program with a concentration in geophysics. Program requirements are: 12 hours from Physics 513-14, 531-32, 541-42, 571-72; a minimum of 12 additional hours in geology, geophysics, and/or physics, as approved by the student’s committee; and the presentation of an acceptable thesis, 6 hours of Physics 500, and the passing of an oral examination on course material and thesis.
Project Option
The course requirements include a minimum of 30 semester hours of graduate credit in courses composed of Physics 506, 511-12; 6 hours from Physics 593, 594 for a Project in Lieu of Thesis; 9 hours from general physics: 411-12, 421, 431-32, 461-62, 507, 508, 521-522, 531-32, 541-42, 555, 571-72 (at least 3 hours above the 500 level); and 6 hours from a single minor field outside of the physics department, such as computer science, mathematics, engineering, chemistry, biology, education, business, or law.

The candidate must pass an oral examination on course material and on the Project representing the culmination of an original research project completed by the student. A written report must be approved and accepted by the Physics Graduate Committee and the Department Head. An electronic version of the written report must also be submitted to the permanent electronic archive of the Physics Department available to the Internet.

Non-Thesis Option
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 semester hours of coursework composed of 18 hours from Physics 511-12 or 513-14, 521-22, 531-32, 541-42, and 571-72; 6 hours in a minor field; and 6 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

All students are expected to take the graduate core curriculum in physics consisting of the following courses: Physics 521-22, 531, 541, 551, and 571. Students concentrating in chemical physics may substitute Chemistry 572 for Physics 551, and should complete at least 6 semester hours from Chemistry 570, 571, 670. Students must take a minimum of 15 hours of 600-level courses, with 6 of these hours in their concentration area. Physics 601-02 are normally required of students concentrating in atomic physics; Physics 621-22 of students in nuclear physics; Physics 626-27 of students in elementary particle physics (and/or Physics 613-14 for students concentrating in theoretical physics); and Physics 671-72 of students in condensed matter and surface physics.

To be admitted to Ph.D. candidacy students must: a) fulfill all general requirements by the Graduate Council, b) pass the qualifying examination, c) have at least a 3.0 GPA on the graduate core curriculum in physics, or d) pass the comprehensive examination and e) pass the comprehensive examination.

The qualifying examination is designed to test the student’s general knowledge of the fundamentals of physics. The performance needed to pass this examination corresponds to a knowledge of the material typically included in the undergraduate physics major curriculum. The qualifying examination should be passed after the student’s first year of study. Based on the student’s performance on a) the qualifying examinations, b) the coursework, c) the GRE scores and d) optional research participation, the faculty will decide if the student will be allowed to continue in the Ph.D. program.

Students are required to find a research advisor and form a doctoral committee before the end of the second year of study. This committee is responsible for advising the student and monitoring his/her progress toward the doctoral degree.

The comprehensive examination is designed to test the student on a) specific knowledge and skills in the areas essential to the student’s research program, b) capability to successfully complete the doctoral dissertation and c) general knowledge of the graduate core curriculum. The most essential component of this examination is the presentation and defense of an original research proposal. The comprehensive examination must be passed before the end of the third year of study. It contains both a written and an oral component and is conducted by the student’s doctoral committee and an additional faculty member appointed by the department head.

The dissertation topic will be chosen with reference to one of the fields in which research facilities can be made available either at The University of Tennessee laboratories in Knoxville; The University of Tennessee Space Institute at Tullahoma, Tennessee; the Oak Ridge National Laboratory, Oak Ridge, Tennessee; or at other research facilities used by the University faculty.

Astronomy
GRADUATE COURSES
411 Astrophysics (3) Development of analytical physical models of galactic structure of universe, stellar and interstellar matter, and planetary systems. Topics and interdisciplinary, consideration of quasars, pulsars, black holes and current developments in field. Acceptable for major credit in physics. Prereq: Physics 336 Introduction to Physics for Physical Science and Mathematics Majors, or 138 Honors Fundamentals of Physics for Physical Science Majors, or 222 Elements of Physics, or 232 Fundamentals of Physics: Wave Motion, Optics, and Modern Physics, and consent of instructor.

490 Special Topics in Astronomy (1-3) Topics of current interest in astronomy and astrophysics. Acceptable for graduate credit in physics with consent of department. May be repeated with consent of department. Maximum 9 hrs.

Physics
GRADUATE COURSES

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. Prereq: 431, or Introduction to Physics for Physical Science and Mathematics Majors or Honors:

Fundamentals of Physics for Physics Majors or Fundamentals of Physics: Wave Motion, Optics, and Modern Physics and consent of instructor. 3 hrs and 3 labs.


461-62 Modern Physics Laboratory (3,3) 461 - Introduction to fundamental and modern techniques in experimental physics, and to theory and practice of measurement and data analysis. Selected experiments in nuclear, atomic, molecular and solid state physics, and modern optics. Prereq: Electronics Laboratory for Physics Majors. Modern Physics or 411. 462 - Advanced experiments and experimental techniques in modern physics; experimental team work. Thorough quantum mechanical interpretation of results and preparation of scientific reports. Prereq: 461. 6 hrs lab per week.

490 Senior Seminar (1-3) Topic of current interest. May be repeated with consent of department. Maximum 6 hrs.

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

501 Graduate Research Participation (3) Advanced research techniques under supervision of staff research advisor whose research coincides with interests of student. Open to all graduate students in good standing. Prereq: Consent of department and research director. May be repeated with consent of department. Maximum 18 hrs. S/NC only. E

502 Registration for Use of Facilities (1-15) 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 Physics Colloquium (1) Lectures and discussion on current research topics. Continuous registration required for current graduate students. May be repeated. Maximum 6 hrs. S/NC only. E

505 Physics of Fluids (3) Fluid physics, overview of fluid mechanics and associated computational techniques; general description of laminar and turbulent flows; subsonic, supersonic and hypersonic flows; continuum, transitional and free-molecular flows; pipe flow, nozzle flow and sonic orifice expansion flows; reacting and nonreacting flows; shock-tube physics; and introduction to method of characteristics and Monte Carlo computational techniques.

506 Experimental Methods (3) Principles, real operational behavior, and hazards of laser types, radiation detection, photomultiplier detectors, image intensifiers, image converters, image dissectors, streak cameras, and fast-framing cameras; high-vacuum systems instrumentation, photomultipliers, optics, spectroscopy, and techniques including synchronous detection, digital electronics methods and micro-computer data acquisition and registration methods.

507 Contemporary Optics (3) Topics in geometrical, physical, Fourier, and nonlinear optics and introductory laser physics. Extensive use of computer calculations and design of practical and sophisticated optical systems.

508 Laser Physics (3) Mode analysis, stable and unstable resonators; rate equations and population inversion, saturation, relaxation oscillations, fluctuations and noise, laser stability; quantum theory of laser, photon coherence; mode-locking, Q-switching and frequency stabilization, special lasers, semiconductor and solid-state, excimer, copper vapor and dye lasers.

511-12 Theoretical Physics (3,3) Concepts and applications of quantum mechanics to condensed matter, two-body and rigid body dynamics, ideal fluid, small oscillations and waves, elements of special relativity, electrostatic and magneto-static problems, EM waves, duality and quanta, absorption, transmission, scattering, classical en- semble and thermal equilibrium, and other modern applications of current interest, in areas of quantum chemistry, biophysics, optics, spectroscopy, and astrophysics. Recommended background: Familiarity with computational methods.
513 Problems in Theoretical Physics I (3) Fundamentals of physics: classical mechanics (Newtonian mechanics, Lagrangian and Hamiltonian dynamics) and electrostatics and magnetostatics.

514 Problems in Theoretical Physics II (3) Fundamentals of physics: electrodynamics, relativity, and quantum mechanics.

521-22 Quantum Mechanics (3,3) Fundamental principles of quantum mechanics, angular momentum, electron spin, particles in electric and magnetic fields, perturbation theory, variational methods, scattering theory; second quantization, quantization of electromagnetic field, emission, absorption, and scattering of light, bra and ket creation and annihilation. Application of quantum mechanics to problems of atomic, molecular, nuclear, and solid state physics. Prereq for 521: 522.

531 Classical Mechanics (3) Variational formulation, Lagrange's and Hamilton's equations, constraints, canonical transformations, Hamilton-Jacobi theory and action-angle variables.

532 Advanced Classical Mechanics (3) Advanced topics in classical mechanics, KAM theorem and Hamiltonian chaos. Topics may vary according to interest of students and instructor. Prereq: 531.

541-42 Electromagnetic Theory (3,3) 541—Review of electrostatics, magnetostatics, and quasi-static problems. Maxwell's equations and their solutions in dielectric and conducting media; electrodynamic and relativity, retarded potentials and gauge transformations, radiation mechanisms, energy, momentum, angular momentum, and fields around accelerated charges. 542—Advanced treatment of Electrodynamics, collisions between charged particles, bremsstrahlung, multipole fields. Topics may vary according to interest of students and instructor. Prereq or coreq for 541: 571. Prereq for 542: 541.


555 Solid State Physics (3) Elementary solid state physics. Crystal structures, reciprocal lattice, bonding in solids, energy bands, semiconductors, phonons, free-electron-gas theory of metals, superconductivity, magnetism, and other forms of broken symmetry. Prereq: 522 or consent of instructor.

561 The Theory of Relativity (3) Geometry of spacetime, relativistic electrodynamics, particle mechanics and continuum mechanics, Einstein's field equations, Schwarzschild solutions, the classical test of general relativity. Prereq: 531 and 542.


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 Special Problems (3) Especially assigned theoretical or experimental work on problems not covered in other courses. May be repeated. Maximum 9 hrs. E


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

601-02 Atomic Physics (3,3) 601—Survey of research problems and methods. Topics of current interest. Intended for all graduate students. 602—Advanced problems for students specializing in field.

605 Laser Spectroscopy (3) Applications of lasers to spectroscopic techniques and molecular systems, absorption, laser-induced fluorescence, and Raman spectroscopy; molecular and atomic coherence, quantum beats, resonance fluorescence, photon echoes, self-induced transparency; saturation and Doppler-free spectroscopy; laser cooling and trapping. Prereq: 521, 541.

606 Nonlinear Optics (3) Nonlinear optical susceptibilities, wave propagation in nonlinear media, sum-frequency and difference frequency generation, harmonic generation, parametric amplification and oscillation, stimulated Raman processes, two- and multifrequency processes, four-wave mixing and phase conjugation, transient coherent optical effects and free induction decay, optical breakdown and nonlinear effects in plasmas. Prereq: 522.

610 Quantum Optics (3) Quantum theory of emission and absorption of radiation; frequency-dependent susceptibility; coherence theory; field quantization and coherent photon states; interaction of radiation with atoms; photon optics, counting and higher-order coherence; atomic scattering phenomena. Prereq: 521.

611 Advanced Quantum Mechanics and Field Theory (3) Survey of problems and methods. Topics of current interest. Intended for all graduate students.

612 Advanced Topics in Quantum Field Theory (3) Renormalization, dynamical symmetry, anomalous magnetic moments, gauge theories, electroweak theory, quantum chromodynamics, grand unified theories, and advanced topics in laser physics and quantum optics. Topics may vary according to interest of students, instructor, and present state of physics. Prereq: 561 or 611 or consent of instructor.

613-14 Quantum Field Theory (3,3) Modern formulation of quantum field theory and its applications: perturbative methods, renormalization, gauge theories (QED, the standard model, GUTs and their super symmetric extensions), string theory and quantum gravity.

621-22 Nuclear Physics (3,3) 621—Survey of research problems and methods. Topics of current interest. Intended for all graduate students. 622—Advanced problems intended for students specializing in the field.

626-27 Elementary Particle Physics (3,3) 626—Survey of elementary particle physics: experimental methods, conservation laws, invariance principles, and models of interactions. Intended for all graduate students. 627—Advanced topics intended for students specializing in field: quark models, electroweak interactions and unification of elementary forces.

642 Advanced Topics in Modern Physics (3) Advanced theoretical or experimental topics not covered in other courses. May be repeated with consent of department. Maximum 9 hrs.

643 Computational Physics (3) Developing computer algorithms for solving representative problems in various fields of physics, celestial dynamics in astrophysics, boundary value problems in electromagnetism, atomic and nuclear structures, band structure in solid state physics, transport problems in statistical mechanics, Monte Carlo simulation of liquids, fitting and interpolation of data, correlation analysis, or optimization strategy. Prereq: 522, 531, 542, and 572.

671-72 Advanced Solid State Physics (3,3) 671—Survey of research problems and methods. Topics of current interest. Intended for all graduate students. 672—Advanced problems intended for students specializing in field.
THE MASTER’S PROGRAM

Ornamental Horticulture and Landscape Design

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 Council and must have completed (in semester hours): 12 hours of 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; 6 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.uky.edu/pls/., or contact the graduate liaison.

Degree Requirements:
1. Approval of the academic program by the master’s committee.

3. Attendance at graduate seminar each semester enrolled.
4. Preparation of a publication-ready, written or graphic communication.

Thesis Option:
1. Satisfactory preparation of a written thesis proposal and its oral defense to the student’s committee, prior to enrolling in 500.
2. Successful completion of 30 hours of graduate credit, which must include 6 hours of 500. At least 14 of these hours must be at the 500 level or above.

Non-Thesis Option:
1. Successful completion of 34 hours of graduate credit, which must include 2-4 hours of 503. At least 22 of these hours must be at the 500 level or above.
2. Completion of a project and preparation of a written report summarizing the project.
3. Passing written and oral examinations covering the project and coursework.

Plant and Soils Sciences

Thesis Option: A written thesis 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 Plant and Soil Sciences 500 Thesis are required. In addition to the thesis hours, a minimum of 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 must take Plant and Soil Sciences 503 Seminar (1 hr) and 511 Soil-Plant Relations (3 hrs). Students pursuing a concentration in soil science must also take at least three of the following courses: Plant and Soil Sciences 512, 513, 514, and 516. All students pursuing a concentration in plant breeding and genetics or in crop physiology and ecology must take two of the following courses: Plant and Soil Sciences 532, 551, and 553.

THE DOCTORAL PROGRAM

A minimum of 72 hours beyond the Bachelor’s degree, exclusive of credit for Thesis 500, is required. Of this number, 24 hours must be Doctoral Research and Dissertation 600. A minimum of 26 hours must be completed in courses numbered above 500 exclusive of doctoral research and dissertation, of which 6 must be in courses numbered above 600. A minimum of 9 hours of graduate coursework must be taken during the doctoral program. The dissertation committee must be outside the major in one or more cognate areas.


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 Plant and Soil Sciences 593, a minimum of 30 hours of graduate coursework is required. At least 20 hours must be taken in courses 501 or above. The student must also take at least 12 of the 30 hours in Plant and Soil Sciences courses, excluding Thesis 500. The student’s committee may require additional coursework beyond the 30 hours if the student’s progress or background indicates a need or deficiency. All students must take Plant and Soil Sciences 503 Seminar (1 hr) and 511 Soil-Plant Relations (3 hrs). Students pursuing a concentration in soil science must also take at least three of the following courses: Plant and Soil Sciences 512, 513, 514, and 516. All students pursuing a concentration in plant breeding and genetics or in crop physiology and ecology must take two of the following courses: Plant and Soil Sciences 532, 551, and 553.
429 Field Study of Public Horticulture Institutions (3) Extended 10 - 12 day field study of various public horticulture institutions: botanical gardens, arboreta, historical house gardens, conservatories, cemeteries, and nature preserves. Travel journal and course portfolio required. Prereq; 326 Public Horticulture. Application and travel fee required. Sp

435 Public Garden Operations and Management (3) Analysis of year-round operations and management of public gardens. Case studies: time and labor management, budget development and management, implementation of volunteer programs, information dissemination techniques, management of grounds and facilities using the University of Tennessee Institute of Agriculture Gardens as model. Prereq; 325 Public Horticulture. Sp

436 Plant and Garden Photography (2) Principles and techniques of photography related to plants and gardens. Equipment options and field shooting under various weather conditions and in different seasons. Prereq; Senior standing and consent of instructor. Sp

446 Horticultural Therapy (3) Application of horticulture as therapy for treatment, rehabilitation and/or training of individuals with disabilities. Prereq; Senior standing and consent of instructor. A

450 Specialty Landscape Construction (3) Methods of designing and building specialized components of landscape industry. Irrigation systems, outdoor lighting, garden ponds and water features. Prereq; 350 Basic Landscape Construction. F

451 Plant Tissue Culture (3) (Same as Botany 451.)

460 Professional Practices in Landscape Construction (3) Functions of nutrient elements in plants; soil factors and nature preserves. Travel journal and course portfolio required. Prereq; 8 hrs biological/botanical sciences, 8 hrs chemistry. Consent of instructor. 1 hr and 4 labs weekly for 5 weeks. Sp,A

500 Thesis (1-15) 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 Seminar (1) Presentations and discussion of current scientific material. May be repeated. Maximum 3 hrs. F,S

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, Horticulture 507, Landscape Architecture and Tourism 507, Ornamental Horticulture and Landscape Design 507.) S/NC only. F

511 Soil-Plant Relationships (3) Principles of mineral nutrition of higher plants: plant physiological characteristics that influence uptake of water and nutrients; functions of nutrient elements in plants; soil factors influencing nutrient availability to plants; important relationships at soil-plant root interface; and responses
to adverse soil environmental conditions. Prereq: Environmental and Soil Sciences 434 or Integrated Plant Systems 431 or general plant physiology. 3 hrs and 1 rec. F.A.

512 Pedology (3) Physical and chemical weathering processes, formation, transformation, soil formation processes. Prereq: Environmental and Soil Sciences 442 or consent of instructor. 2 hrs and 1 lab. Sp, A.

513 Advanced Soil Chemistry (3) Chemical properties and processes that operate in soil environment: thermodynamics of soil solutions and surface chemistry of soils, soluble complex formation, mineral solubility, electrochemical equilibria, geochemical modeling, isotherm, surface properties, surface reactivity, adsorption phenomena, and surface complexation modeling. Prereq: Environmental and Soil Sciences 434 or consent of instructor. Sp, A.


516 Soil Biology and Biochemistry (3) Soil organisms and their activities in soils: soil ecology, bio-geochemical cycling of important elements, organic matter dynamics, and applications of agricultural and environmental biotechnology. Prereq: Soil science. 2 hrs and 1-3 hr lab. F, A.

530 Integrated Pest Management (3) (Same as Entomology and Plant Pathology 530,) F, A.


536 Ecology of Grazing Land Systems (3) Multi-university, field-oriented course. Components and functions of grazing lands and how these vary in different ecosystems; research needs, objectives and techniques in soil-plant-animal research; forage-vegetation ecology and systems in grazing lands (cropland, pastureland, rangeland and forestland); role of forages in conserving soil and water resources, soil and plant ecological interactions and research needs. Prereq: Soil science. 2 hrs and 1-3 hr lab. F, A.

551 Organismal Plant Genetics (3) Discovery of genotypes, polycombromosomal inheritance, apomixis, incompatibility systems, mutations, controlling elements, quantification of heritability and reactivity. Prereq: General genetics, Plant Sciences and Landscape Systems 471 or equivalent, F, A.

553 Plant Breeding Technologies (3) Principles and methodologies targeting genetic gain for crop improvement: concepts of qualitative and quantitative trait improvement. Parental germplasm, population formation, hybridization, inbreeding, genetic variance, heritability, genetics, concepts and applications of molecular genetic markers to identify superior germplasm for increased selection efficiency. Prereq: Plant Sciences and Landscape Systems 471 and general genetics. F, A.

571 Design and Analysis of Biological Research (3) (Same as Animal Science 571.) Sp.

593 Special Problems in Plant and Soil Science (1-3) May be repeated. Maximum 6 hrs. E

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

601 Special Topics in Soil Science (1-3) Thermodynamics of soil solutions, clay structure and surface chemistry, soil mineralogy, plant mineral nutrition, soil microbiology, water movement and use by plants, soil structure, soil thermal properties, interaction in the soil-plant environment. May be repeated. Maximum 6 hrs. E.

603 Special Topics in Crop Physiology and Ecology (1-3) Microclimatology of agroecosystems, crop dormancy and responses to stress, physiology of crop growth and reproduction. Inferences of physiology 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, estimation of quantitative parameters, mutations, chromosomal dynamics, polyploidy, genetic engineering of crop species, and crop improvement. Prerequisites: Genetics. F.

613 Advanced Topics in Soil Chemistry and Fertility (2) Topics of current significance; scientific literature. Prereq: 513 or equivalent. Sp.

614 Advanced Topics in Soil Biology and Biochemistry (2) Topics of current significance; scientific literature. Prereq: 516 or equivalent. F, A.

615 Advanced Topics in Soil Physics, Genesis, and Morphology (3) Topics of current significance; scientific literature. Sp, A.

633 Plant Metabolism (3) Metabolism of chemical compounds of economic importance in crop production: plant growth regulators, naturally occurring plant metabolites and herbicides. Prereq: Botany 520 or 522, and organic chemistry or biochemistry. Sp, A.

653 Advanced Plant Breeding (4) Development and utilization of concepts of quantitative parameters, inbreeding, heterosis, methods of selection, in vitro breeding, interspecific hybridization, stability parameters, genetic resistance and vulnerability to pests and environmental stresses. Prereq: 571 and Integrated Plant Systems 453 or equivalent or consent of instructor. 3 hrs and 1 lab. Sp, A.

Plant Sciences and Landscape Systems

GRADUATE COURSES

471 Statistics for Biological Research (3) Application of statistics to interpretation of biological research. Notation, descriptive statistics, probability, distributions, confidence intervals, t and chi-square tests, analysis of variance, mean separation procedures, linear regression and correlation. Prereq: Calculus. F

Political Science

(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., Ph.D. .......... Wisconsin (Milwaukee)
Gant, Michael M., Ph.D. .......... Michigan State
Gorman, Robert A., Ph.D. ........ New York
Lyons, William, Ph.D. ............ Oklahoma
Plass, Hyram, Ph.D. ............ Utah
Scheb, John M., II, Ph.D. .......... Florida
Smith, T. Alexander, Ph.D. .......... Ohio State
Stephens, Otis H. (Distinguished Prof.), Ph.D. .......... Johns Hopkins
Ungs, Thomas D. (Emeritus), Ph.D. .......... Iowa
Welborn, David M. (Emeritus), Ph.D. .......... Texas

Associate Professors:

Folz, David H. (Liaison), Ph.D. .......... Tennessee
Houston, David J., Ph.D. .......... SUNY (Binghamton)
Kelly, Janet, Ph.D. .......... Wayne State
Nowes, Anthony J., Ph.D. .......... Kansas
Peterson, Robert L., Ph.D. .......... Yale
Zhong, Yang (Liaison), Ph.D. .......... Kentucky

Assistant Professors:

Capirola, Mary, Ph.D. .......... Connecticut
Caricieri, Martin, Ph.D. .......... California (Santa Barbara)
Lipinski, Daniel, Ph.D. .......... Duke
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 Law. Inquiries concerning all programs should be directed to the department office.

ADMISSION REQUIREMENTS

Three departmental recommendation forms must be submitted to the Office of Graduate Admissions, 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. It consists of a total of 39 semester hours. 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 M.P.A. program is intended to prepare students for public service careers by acquainting them with management principles, analytical tools, and the 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 or 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 1100 on the verbal and quantitative parts of the GRE is desired. 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 M.P.A. is a non-thesis program requiring 39 hours. Specific requirements include the following:

1. Core Curriculum (24 hours)
   a. General perspectives (9 hours) - 550 Public Administration; 552 Organization Theory; and any one of the following: 442 Administrative Law; 539 State and Local Government; 540 Public Law; 548 Public Policy Process; 558 The Politics of Administration; or 566 Ethics, Values, and Morality in Public Administration.
   b. Analytical skills (6 hours) - 512 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; 564 Human Resource Management; 556 Policy Analysis.
   d. Specialization (9 hours)
      A specialization is designed by the student in consultation with the coordinator of the M.P.A. degree program. Possible specializations include general government, public health, budgeting and finance, planning, natural resources, program evaluation, criminal justice, public relations, personnel, and others.
   e. Recommended Internship (6 hours)
      Internships are arranged in consultation with the coordinator of the M.P.A. degree program.
   f. 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 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 and the Office of Graduate Admissions for the M.P.A. 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 M.P.A. program. Application may be made prior to or after matriculation to the J.D. or the M.P.A. 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 M.P.A. degree.

Curriculum

A dual degree candidate must satisfy the requirements for both the J.D. and the 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 toward the M.P.A. 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). 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 the 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 a grade of C- or lower. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of 2.3 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 should normally have completed a master’s degree in political science or a related field with a 3.5 GPA and have earned a composite score of at least 1100 on the verbal and quantitative parts of the Graduate Record Examination.

Doctoral students admitted to the program must complete 84 hours beyond the bachelor’s degree, including 24 hours of coursework beyond the master’s degree, graded A-F, must successfully pass written comprehensive examinations in two broad subfields of political science, and must pass a final oral examination on the dissertation. In addition, students must satisfy a research tool requirement. Usually, students meet this requirement by completing 12 hours of coursework numbered above 500 in empirical theory and research methodology. However, if a student’s advisor and program committee certify that competency in a foreign language is a more appropriate research tool, a foreign language can be used instead.

In addition to the total hours required for the degree, the following requirements must also be met:

1. At least 69 hours must be in political science courses.
2. At least 54 hours in political science must be in courses numbered above 500.
3. Completion of Political Science 510, 511, and 512.
4. Completion of at least three courses or seminars at UT in each of the two broad subfields in which the students take examinations.
5. Completion of at least one course or seminar in each of the five broad subfields available for graduate instruction in the department.
6. At least 6 hours must be earned in political science courses numbered above 600.
7. A total of 24 hours must be earned by writing the dissertation.

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. (Same as Legal Studies 430)

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. (Same as Legal Studies 431)
435 Criminal Law and Procedure (3) Substantive and procedural law in criminal justice field: constitutional questions and public policy issues.

441 Public Budgeting (3) Process, participants, and politics of government budgeting; federal government budgeting. Overview of budget reform measures and their effectiveness.

442 Administrative Law (3) Legal dimensions of administrative power and procedures, and constitutional controls over administrators. (Same as Legal Studies 442.)

451 Ethnic Conflict in Foreign Countries (3) Examination of political and violent conflict among ethnic and national groups and challenges these conflicts pose for democratic and democratizing states.

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 Latin American Government and Politics (3) Political development of Latin America: contemporary politics. (Same as Latin American Studies 456.)

459 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) Governments and movements in 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. (Same as Legal Studies 470.)

471 International Political Economy (3) Economic relations between countries; theoretical and case studies of efforts to construct multilateral international institutions. Topics: economic growth, international trade and investment, development and global equity.

475 Ancient and Medieval Political Thought (3) Survey of major western political thinkers from Socrates to Marsilio of Padua.

476 Modern Political Thought (3) Survey of major western political thinker from Machiavelli to Marx.

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

502 Registration for Use of Facilities (1-15) 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 Scope and Methods in Political Science (3) Procedures of analysis in political science.

511 Research Design (3) Methods for planning and executing research, from case studies to experimental designs: development of research questions and hypotheses; measurement issues; and validity of inferences.

512 Quantitative Political Analysis (3) Methods and techniques in quantitative political analysis: univariate and bivariate statistics.

513 Quantitative Political Analysis (3) Methods and techniques in quantitative political analysis: multivariate model building.

514 Research and Methodology in Public Administration (3) Assumptions and techniques of research in public administration; measurement, analysis, and reporting of data.

520 Political Theory (3) Survey of major ideas, thinkers and works of Western political theory.

522 American Political Thought (3) Systematic examination of the nonempirical and empirical theories of leading American political thinkers from the colonial period to the present.

530 American Government and Politics (3) Survey of literature, approaches to research and analysis, critical examination of major works, and overviews of research in various subfields. May be repeated with consent of department. Maximum 9 hrs.

532 Presidency (3) Systematic examination of the structure, functions and powers of the American presidency as they have evolved from the founding to the present.

533 Congress (3) Formal, empirical and theoretical approaches to research and modeling of institutional workings of Congress and the behavior of legislators.

535 Mass Political Behavior (3) Theoretical and empirical analyses of public opinion, political socialization, political attitudes and behavior, especially voting behavior.

537 Political Parties and Interest Groups (3) Theoretical and empirical examination of the structure, functions and operations of political parties and interest groups.

539 State and Local Government and Politics (3) Theoretical and empirical examination of government, politics, policymaking and public administration at the state and local levels.

540 Public Law (3) Selective examination of published research and current approaches in subfields of constitutional law, judicial process, and judicial behavior. May be repeated with consent of department. Maximum 9 hrs.

548 Public Policy Process (3) Theoretical, formal and empirical analysis of the roles, functions and decision making processes of public policymakers, including legislative, executive and judicial actors.

550 Public Administration (3) Overview of public administration theory and function.

552 Organization Theory (3) Appraisal of major theories of organization and their applicability to public sector.

556 Policy Analysis (3) Strategies and techniques for identification and analysis of public problems and policy solutions. May be repeated with consent of department. Maximum 9 hrs.

558 The Politics of Administration (3) Examination of public administration in context of American political system, policy making and political roles of public administrators and agencies. May be repeated with consent of department. Maximum 9 hrs.

560 Public Financial Administration (3) Principles and techniques of public finance at state and local levels: budget preparation, execution and audit, risk management, capital planning, major tax structures, economic forecasting, cash management, and debt administration.

562 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.


566 Ethics, Values, and Morality in Public Administration (3) Moral-ethical-value dilemmas confronting administrators in American political system.

569 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.

570 Comparative Government and Politics (3) Selected topics in modern governments. May be repeated with consent of department. Maximum 9 hrs.

572 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.

574 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. Prereq: Consent of instructor. S/NC only.

595 Readings and Special Problems in Political Science (1-3) Prereq: 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 in use of software applications for personal computer. S/NC only.

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

610 Special Topics in Empirical Theory and Methodology (3) Advanced methods and procedures of analysis in political science. May be repeated with consent of department. Maximum 9 hrs.

615 Formal Political Analysis (3) Assumptions, methods and applications of formal political models, including game theory, rational choice theory, and public choice theory, and mathematical modeling. May be repeated with consent of instructor. Maximum 9 hrs.

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 decisional development of constitutional law as major component of public policy. May be repeated with consent of department. Maximum 9 hrs.

654 Contemporary Public Policies (3) Problems in one or more public policy areas from political and administrative perspectives. Topics selected by instructor. May be repeated with consent of department. Maximum 9 hrs.

660 Contemporary Perspectives on Public Administration (3) Development of theory in public administration: contemporary critiques and alternatives. May be repeated with consent of instructor. Maximum 9 hrs.

668 Special Topics in Public Administration (3) Analysis of selected issues and problems in public administration. May be repeated. Maximum 9 hrs.

670 Special Topics in Comparative Government and Politics (3) Research into selected topics. May be repeated with consent of department. Maximum 9 hrs.

682 Theory and Analysis of U.S. Foreign Policy Processes (3) Theoretical approaches to decision making in foreign policy area and analysis of policy making process. May be repeated with consent of department. Maximum 9 hrs.

688 Special Topics in International Politics (3) Selected issues and problems in international politics. Specific content determined by instructor. May be repeated with consent of instructor. Maximum 9 hrs.
Polymer Engineering
See Materials Science and Engineering

Psychology
(College of Arts and Sciences)

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

James E. Lawler, Head

Professors:
Burghardt, Gordon M. (Distinguished Prof.), Ph.D. ......................... Chicago
Calhoun, William H. (Emeritus), Ph.D. California
Fine, Harold J. (Emeritus), Ph.D. ...... Syracuse
Handel, Stephen J., Ph.D. ...... Johns Hopkins
Handler, Leonard, Ph.D. .......... Michigan State
Jones, Warren H., Ph.D. .......... Oklahoma State
Lawler, James E., Ph.D. .......... North Carolina
Lawler, Kathleen A., Ph.D. .......... North Carolina
Lounsbury, John W., Ph.D. ........ Michigan State
Lubar, Joel F., Ph.D. ................. Chicago
Maloney, John C., Ph.D. .............. Duke
Nash, Michael R., Ph.D. .......... Ohio
Newton, Kenneth R. (Emeritus), Ph.D. Tennessee
Pollio, Howard R. (Distinguished Prof.), Ph.D. Michigan
Samejima, Fumiko, Ph.D. ................... Keio
Saudargas, Richard A., Ph.D. ........ Florida State
Shrader, Raymond R. (Emeritus), Ph.D. Tennessee
Sundstrom, Eric D., Ph.D. .......... Utah
Travis, Cheryl B., Ph.D. .......... California (Davis)
Verplasclan, William S. (Emeritus), Ph.D. Brown
Wahler, Robert G. (Liaison), Ph.D. Washington
Wiberley, J. Albert (Emeritus), Ph.D. Syracuse

Associate Professors:
Baldwin, Deborah R. (Liaison), Ph.D. Kent State
McIntyre, Anne, Ph.D. ................. Yale
Morgan, Wesley G., Ph.D. ............ Tennessee
Welsh, Deborah, Ph.D. .......... Massachusetts

Assistant Professors:
Gaertner, Lowell, Ph.D. .......... North Carolina
Gordon, Kristina C., Ph.D. .......... North Carolina
Hopko, Derek R., Ph.D. .......... West Virginia

THE MASTER’S PROGRAM
Graduate study leading to the M.A. degree in psychology is available with a concentration in experimental psychology. This program 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 committee approval comes from the Graduate Dean, upon recommendation by the Department Head.

Program Requirements
All students must complete 32 semester hours of graduate level courses in psychology. These hours must include 515, 521-22, or Statistics 531-32 or an equivalent sequence; 565 or 420; six semester hours of Thesiss 500; and twelve hours of 500- or 600-level foundation courses; plus additional graduate level hours to reach the 32-hour requirement. Students must earn a grade of B or better in all courses that are to count toward the 32-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. All students must submit scores from the Graduate Record Examination (general and subject).

Experimental Psychology
The Experimental 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.

The basic requirements are:
1. Twelve hours of statistics and research (521-22 or Statistics 531-32 or equivalent and 6 additional hours in research methods or design).
2. Fifteen semester hours in experimental psychology (565 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.

Clinical Psychology
This program is designed to lead 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 experiences 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 papers, 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 courses 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:
1. Apprenticeship with one faculty member during the first year, two days each week.
2. Predissertation research project completed before forming a doctoral supervisory committee, reported in written form acceptable to two members of the faculty or, if reviewed and accepted for publication or external presentation, by one member of the faculty.
3. Supervised clinical placement two days (16 hours) each week during the second year, and the following option during the third and fourth years:
   a. continued two day clinical placement in the third and fourth years.
   b. teaching assistantship in the department in either the third or fourth year and two day clinical placement in the other year.
4. Satisfactory completion of listed courses (or equivalents) in the following sixteen categories:
   a. Foundations of Psychology: Biological Factors, Perception, Learning, Thinking, Motivation (513);
   b. Interviewing and Observation (558) and Laboratory (559);
   c. Research Practicum (509) (4 hrs.); Life-Span Development (512) or Developmental Psychology (511);
   d. Personality: Theory and Research I and II (570-71);
   e. History and Systems of Psychology (565);
   f. Research Questions and Designs (580);
   g. Psychological Assessment I and II (594-95) and Laboratory (596);
graduated students in psychology. May be repeated. Maximum 6 hrs. 

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. Sp.

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.

489 Supervised Research (1-9) 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) P/NP only. E

502 Registration for Use of Facilities (1-15) 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 be used toward undergraduate requirements. May be repeated. S/NC only. E

505 Research Design (3) Techniques for planning and conducting research in controlled and natural settings: experiments, quasi-experiments, observational studies, surveys, and program evaluations. Development of questions and hypotheses for study, Design of studies to maximize validity. Prereq: Consent of instructor. Sp.

507 Foundations of Applied Psychology (3) Fundamental methods for application of psychology principles and techniques in community, organizational, and industrial settings, and related ethical and theoretical issues. Prereq: 505 and consent of instructor.

508 Readings and Special Issues in Psychology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

509 Research Practicum (1-3) Required of first-year graduate students in psychology. May be repeated. Maximum 9 hrs. S/NC only. E

510 Topics in Psychology (3) Intensive examination of selected issues in psychology. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. F

511 Developmental Psychology (3) Normal processes of human socialization; physical, cognitive, and emotional development from conception through infancy, childhood, and adolescence. Consents: Consent of instructor. May be repeated. Maximum 6 hrs. F

512 Life-Span Development (3) Theories and research concerning normal human development throughout life, adulthood and old age. Prereq: Consent of instructor. F

513 Foundations of Psychology: Biological Factors, Perception, Learning, Thinking, Motivation (3) Intensive survey. Prereq: Consent of instructor.

515 Colloquium in Experimental Psychology (1) Research and practical issues in experimental psychology. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. S/NC only. F,Sp

516 Colloquium in Ethology (1) Current research and theory. May be repeated. Maximum 9 hrs. (Same as Ecology and Evolutionary Biology 516.) S/NC only. E

521 Analysis of Variance for Social Sciences (3) Analysis of variance; analysis of covariance; application of analysis of variance to social science framework. Prereq: 500 and/or faculty time before degree is completed. May be repeated. Maximum 6 hrs.

522 Multiple Regression for Social Sciences (3) Complexities of regression analyses and theory: application within social science framework. Bivariate correlation and regression, multiple regression, analysis of variable sets, interactions among continuous predictors, reducing co-linearity between main effects and application of multiple regression to testing procedures of mediation and moderation. Prereq: Consent of instructor. F

526 General Vertebrate Neuroanatomy (3) Lecture and laboratory. Structure and functioning of central and peripheral nervous system. Prereq: 461 or equivalent and consent of instructor.

527 Behavioral Neurology (3) Disorders of nervous system, organic brain dysfunctions. Diagnosis and treatment. Prereq: Consent of instructor.

528 College Teaching in Psychology (3) Concepts, techniques, and materials for teaching psychology at college and/or university level. Supervised practice. Prereq: Consent of instructor. S/NC only.


545 Advanced Animal Behavior (3) (Same as Ecology and Evolutionary Biology 545.)

546 Ethological Psychology (3) Basic ethology and comparative psychology. Implications for human behavior. Prereq: Consent of instructor. (Same as Ecology and Evolutionary Biology 546.)

547 Conceptual Foundations of Evolution and Behavior (3) Critical evaluation of seminal writings on theory and methods in comparative analysis of behavior. Prereq: Consent of instructor. (Same as Ecology and Evolutionary Biology 547.)

550 Social Psychology (3) Survey of theory and research concerning interpersonal interaction and individual behavior in social context. Prereq: Consent of instructor. F

554 Laboratory in Psychometrics (3) Further learning about psychometrics theories: item response theory (modern mental test theory), factor analysis, and applications of those methods using computer programs to simulated or empirical data. Prereq. 555. May be repeated. Maximum 6 hrs.

555 Psychometrics (3) Basic concepts: factor analysis, scaling, test theories, probability models and their applications, computerized adaptive testing and other topics. Prereq: Statistics 537-538 or equivalent. May be repeated. Maximum 6 hrs.


558 Interviewing and Observation (3) Sensitizing students to own feelings and beliefs and to feelings of interviewee, and analysis of language content, style, and body language. Exploration of various important aspects of interviewee’s life. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 559.

559 Laboratory in Interviewing and Observation (1) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 558.

560 Psychology of Learning (3) Review of current evidence from research involving human and/or non-human animals. Prereq: Any 300 or graduate level course in psychology. May be repeated. Maximum 6 hrs.


570 Personality: Theory and Research I (3) Advanced survey of psychodynamic and neo-Freudian approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor. F

571 Personality: Theory and Research II (3) Advanced survey of behavioral and humanistic approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor. Sp.
573 Descriptive and Theoretical Psychopathology (3) Current psychiatric taxonomic system. Theories of etiology for various diagnostic categories. Examples from written case vignettes and recorded interviews. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. F

575 Psychopharmacology (3) Connections between pharmacology and psychology. Prereq: Consent of instructor.

576 Object Relations (3) European and American conceptions of normal and psychopathological development of object relations. Significance for psychotherapy, psychoanalysis, and psychoanalytic theory. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.

580 Research Questions and Designs (3) Question-asking process in research and strategies or designs through which answers might be derived. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.

593 Independent, Off-campus, or Foreign Study (1-15) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

594 Psychological Assessment I (3) Basic concepts and techniques of adult assessment: intelligence tests and personality tests. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. F

595 Psychological Assessment II (3) Basic concepts and techniques of adult assessment: intelligence tests and personality tests. Prereq: Admission to doctoral program in clinical psychology and 594 or consent of instructor. F

596 Laboratory in Psychological Assessment (1) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 594 or 595. May be repeated. Maximum 4 hrs. S/NC only. Sp

600 Doctoral Research and Dissertation (3-15) Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. S/NC only. Sp

601 Seminar in Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. Sp

607 Seminar in Applied Psychometrics (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. Prereq: 555, 557, and consent of instructor. Sp

610 Seminar in Applied Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. Sp

613 Seminar in Existential-Phenomenological Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. Sp

617 Seminar in Cognitive Science (3) Prereq: 543 and consent of instructor. May be repeated. Maximum 12 hrs. Sp

623 Seminar in Methods of Naturalistic Research (3) Prereq: 546 or consent of instructor. May be repeated. Maximum 12 hrs. Sp

635 Ethical, Legal, and Professional Issues in Psychology (3) Research, human services, teaching and public policy. Prereq: Admission to doctoral program in psychology or consent of instructor. (Same as Counselor Education and Counseling Psychology 635 and Psychoeducational Studies 635.) S/NC only. Sp

670 Psychotherapy I (3) Theories and principles. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. F

671 Psychotherapy II (3) Theories and principles. Prereq: Admission to doctoral program in clinical psychology and 670 or consent of instructor. Sp

673 Laboratory in Psychotherapy (2) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 670 or 671. May be repeated. Maximum 6 hrs. S/NC only. Sp

683 Seminar in Behavioral Medicine (3) Current research on the counseling relationship between behavior and health. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. Sp

695 Field Placement in Clinical Psychology (3) Prereq: Admission to doctoral program in clinical psychology and consent of instructor. May be repeated. Maximum 24 hrs. S/NC only. E

696 Advanced Psychology Clinic Placement (1-3) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. May be repeated. Maximum 24 hrs. S/NC only. E


### Religious Studies

(College of Arts and Sciences)

James L. Fitzgerald, Interim Head

Professors:
- Dungan, David L., Th.D. .............. Harvard
- FitzGerald, James L., Ph.D. .......... Chicago
- Hackett, Rosalind J., Ph.D. ........... Aberdeen
- Humphreys, W. Lee (Emeritus). Pr, Ph.D. ....... Vanderbilt
- Lusby, F. Stanley (Emeritus).
- M.Div. .................................. Colgate Rochester
- Levering, Miriam L., Ph.D. ............ Harvard
- Norman, Ralph V., Jr., Ph.D. ............ Yalie
- Reynolds, Charles H., Ph.D. .......... Harvard
- Schmidt, Gilya G., Ph.D. ............... Minneapolis

A master’s degree in Philosophy with a concentration in religious studies is available. Contact the department for details of this program. Graduate courses in religious studies provide opportunity for students in a variety of disciplines to pursue work in religious studies as a graduate concentration.

### GRADUATE COURSES

405 Modern Jewish Thought (3) History, culture, and geography of the now 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 Nicolas of Cusa to nineteenth-century German Idealists. (Same as Philosophy 411.)

412 Classical Indian Systems of Philosophy: The Moksha Tradition (3) Investigation of selected writings and philosophic problems of 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.

499 Proseminar in Religious Studies (3) For advanced students in religious studies; required for majors. Selected specific topics: nature and function of myth in religion, problem of evil, transcendence, theories of religion, hermeneutics, integrating various disciplines involved in study of religion. 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, 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 journalism, 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.

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

(College of Social Work)

MAJOR DEGREES

Social Work .................................. M.S.W., Ph.D.

Karen Sowers, Dean
**Professors:**
Bloch, Mary H. (Emeritus), M.S. ..... Ohio State
Cetnok, Muammar, Ph.D. ..... Washburn, Washington (St. Louis)
Faver, Catherine, Ph.D. ..... Michigan
Fryer, Gideon W. (Emeritus), Ed.D. ..... Columbia
Gliisson, Charles A., Ph.D. ..... Washington (St. Louis)
Granger, Ben P. (Emeritus), Ph.D. ..... Brandeis
Hirayama, Hisashi (Emeritus), D.S.W. ..... Pennsylvania
Lamarr, Georgiana (Emeritus), M.S.S.W. ..... Tennessee
Mullins, M.K. (Emeritus), Ph.D. ..... Chicago
Nooe, Roger M. , D.S.W. ..... Tulane
Nugent, William, Ph.D. ..... Florida State
Orme, John, Ph.D. ..... Washington (St. Louis)
Orten, James D. (Emeritus), D.S.W. ..... Alabama
Rubenstein, Hia (Emeritus), Ph.D. ..... Chicago
Shatz, Eunice (Emeritus), Ph.D. ..... Brandeis
Sowers, Karen, Ph.D. ..... Florida State
Wodarski, John, Ph.D. Washington (St. Louis)

**Assistant Professors:**
Campbell, Paul M., D.S.W. ..... Alabama
Combs-Orme, Terri, Ph.D. ..... Washington (St. Louis)
Dupper, David R., Ph.D. ..... Florida State
Egan, Marcia, Ph.D. ..... Maryland
Galambos, Coen M., D.S.W. ..... Catholic University of America
Patterson, David, Ph.D. ..... Utah
Rocha, Cynthia, Ph.D. Washington (St. Louis)
Ross, Mary, Ph.D. ..... Washington (St. Louis)
Spicuzza, Frank, M.S.S.W. ..... Tennessee
Vaughn, Hugh H., Ed.D. ..... Memphis State

**Clinical Associates/Field Practice Coordinators:**
Allen, Sandra (Memphis), M.S.S.W. ..... Tennessee
Betz, Phyllis (Knoxville), M.S.S.W. Tennessee
Bowers-Mitchell, Drema (Nashville), M.S.S.W. ..... Tennessee
Enochs, Peggy (Nashville), Ed.D. ..... Tennessee State

**The Master's Program**
The Master of Science in Social Work program prepares social workers to provide professional leadership in 1) clinical social work practice and 2) social work management and community practice. These objectives are met through a curriculum requiring of all students a professional foundation and a concentration in either clinical social work practice or social welfare management and community practice. The M.S.S.W. program is accredited by the Council on Social Work Education.

**Admission Requirements**
Admission to the master's program is based on the following requirements:
1. A Bachelor's degree from an accredited college or university with appropriate preparation in the social sciences. At least three-fourths of the applicant's undergraduate work should be in the social sciences, humanities, physical sciences, and other arts and sciences subjects. Applicants must have a course in biology and demonstrate a liberal arts perspective through coursework in at least four of the following five areas: economics or mathematics; government; political science or history; sociology or anthropology; psychology; philosophy, literature, or the arts.
2. Personal qualifications acceptable for entrance into the professional practice of social work.
3. All applicants must submit up-to-date evidence of the ability to perform at a satisfactory level. The University requires a minimum GPA of 2.7 for admission to graduate study.
4. Preference is given to applicants with a GPA of 3.0 or above in their undergraduate work with substantial preparation in the social sciences.

**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 higher, and (3) personal qualifications acceptable for entrance into the professional practice of social work. Students applying for 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.

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 administrated 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 30 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 non-thesis option. Students pursuing the thesis option receive six credit hours for successful completion.
3. Students must successfully complete a comprehensive exam or thesis defense.
4. Students must have 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. It contributes to the process of professional identification and 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 groups. 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) amelioration 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)
523 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 Work 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 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)

Transfer Credits
- Minimum of three (total of 9 hours) advanced course electives as follows: One course in research 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 assure that students have quality field practice experiences that meet 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 during 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 the student’s individual interests, capabilities, 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 experience focuses 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 Council and the College of Social Work. Transfer courses must be approved as equivalent to required and/or elective courses taken for graduate credit and passed with a grade of B or better. An S (earned on an S/N/C system) for the field practicum is also acceptable. In addition, transfer courses must be part of an otherwise satisfactory graduate program (B average) and be approved by the dean. This 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 Council 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. Students interested in proficiency examinations are referred to the Graduate Catalog 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 curriculum are completed and elective coursework begun during the first year of study. Social Work 670 and the elective course 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 comprehensive exam 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 for social workers desiring supervisory, management, administration and community practice training and education to enhance career advancement or career redirection. A master's degree in social work or a closely related field is required for admission.

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 Administrative Services Assistant in the Office of Graduate Admissions.

**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 general to social work practice at various systems levels. Assessment, planning, communication, intervention, and evaluation skills.

502 Registration for Use of Facilities (1-15) 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 families 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 methodology with respect to theory development and application to social work theory and practice. History and philosophies of science; research formulation; research design; ethics; instrument usage; construction; data collection; analysis and reporting; and evaluation and utilization of research.

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. Interactions among biological, social, psychological and cultural systems on development across life cycle. Effects of ethnic, racial, economic, gender, and sexual orientation variables. 514—Life cycle from infancy through adolescence. 515—From young adulthood through senescence.

516 Social Welfare Policy and Services (3) Development of contemporary social policy at local, state, national, and international levels. Contribution of social work to formal policy making process through which macrosocial 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/ecological/economic systems and personal experience. Connection 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 content 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 perspectives 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 with groups and principles supporting specific types of group work used in clinical practice and associated leader interventions.

526 Evaluating Clinical Practice (3) History and philosophies, conceptual approaches, techniques and methods in the practice and use of practice research as applied to implementation and evaluation of direct practice. S/NC only.

530 Seminar in Clinical Social Work (2-3) Topics in theory and practice of clinical social work with individuals, couples, families and groups. May be repeated. Maximum 6 hrs.

532 Short-Term Interventions (3) Theory and practice of short-term, emergency, and crisis interventions.

533 Social Work Interventions with Couples (3) Theories regarding contemporary marital/partnering lifestyles, problem areas in relationships, methods and skills for problem resolution.

534 Social Work Interventions with Children and Adolescents (2-3) Theoretical and practical modalities for assessing and intervening with children and adolescents.

535 School Social Work (3) Place of school as community institution and resource. Methods, processes, and techniques employed in school social work.

540 General Topics in Social Work (3) Current topics in advanced social work. May be repeated. Maximum 6 hrs.

541 Leadership and Management in Human Services (3) Management practices and leadership skills required in development and management of human and social services delivery systems. Issues regarding human resources management, resource allocation, strategic planning, and organizational dynamics.

543 Financial Management and Resource Development (3) Administrative decision-making related to financial planning and resource allocation in human service organizations. Knowledge and skills in budgeting, allocating, expenditure control, fundraising, grant writing, marketing, and evaluation.

547 Evaluation Research (3) History and philosophies, conceptual approaches, techniques and methods in the practice and use of evaluation research as applied to development and evaluation of social work programs and policies. Issues pertaining to strategies, methods, and evaluation methods, microcomputer application of data, and measurement of program goals and objectives.


552 Community Organization (3) Locality development, social planning and social action as practice modalities for development of resources to meet human needs.

561 Supervision and Consultation in Social Work (3) Roles, techniques, and practices of social work supervision and consultation.

564 Substance Abuse (3) Survey and analysis of social, cultural, medical, and psychological factors underlying alcoholism and drug abuse, and addiction; recent research and practice innovations.

566 Social Gerontology (3) Physical, psychological and social aspects of aging, and major social policies and programs.

580 Field Practice (3) Instruction and supervision in social work practice. S/NC only.

581 Field Practice (3) Instruction and supervision in social work practice. S/NC only.

582 Field Practice (6) Instruction and supervision in clinical social work practice and community practice. S/NC only.

583 Field Practice (6) Instruction and supervision in clinical social work practice and community practice. S/NC only.

584 Field Practice (2-6) Instruction and supervision in social work practice. May be repeated. S/NC only. E

585 Seminar in Gerontology (1) (Same as Human Ecology 585, Counseling Education and Counseling Psychology 585, Exercise Science 585, Nursing 585, Public Health 585, Psychoeducational Studies 585, and Sociology 585.)

593 Independent Study (1-6) Individualized study, student selects, designs, and completes examination of special issue or problem. May be repeated. Maximum 6 hrs.

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

601 Research for Social Work Practice I (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice. F

602 Research for Social Work Practice II (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice. Sp

604 Research in Social Service Settings (3) Advanced research, under faculty supervision, of practice issues in community agency. Prerequisite: First year required Ph.D. courses or consent of instructor. May be repeated. Maximum 9 hrs. F,Sp

605-06 Analysis of Social Work Data I, II (3,3) Techniques for quantitative analysis of social work data: unique data analysis problems encountered in social work research.

608 Evaluative Research for Social Work Practice, Programs and Policy (3) Techniques and strategies for quantitative and qualitative analysis for social work impact on individuals and groups, and for evaluating processes and outcomes of social work practice.

613 Social Work Practice and Its Social Context II (3) Critical analysis of knowledge bases of major practice in administration and planning. Sp

640 History of American Social Work (3) Social, cultural, economic and political contexts for development of social work profession, development of education for profession, and modern welfare system. F

650 Programs and Legislation for Children and Families (3) Background, purposes, and current issues surrounding major social welfare and health programs serving disadvantaged children and their families: Social Security Act (Title IV, Child Welfare and AFDC; Title V, the Maternal and Child Health Block Grant; Title XIX, Medicaid), Head Start, WIC and other nutrition programs, and Healthy Start. Current issues and controversy; legislative changes.


670 Critical Literature Reviews (3) Techniques and methods for conducting critical reviews of literature: conceptual and methodological critiques of existing research. S/NC only.

693 Directed Study in Social Work Research (3) Advanced individual study, under faculty guidance, of social work practice issues. Prereq: First year required. Ph.D. courses or consent of instructor. May be repeated. Maximum 9 hrs. F,Sp

Sociology

(College of Arts and Sciences)

MAJOR DEGREES

Sociology ........................................ M.A., Ph.D.

Suzanne B. Kurth, Head

Professors:

Hastings, Donald W., Ph.D. .... Massachusetts
Hood, Thomas C., Ph.D. ............... Duke
Perrin, Robert G., Ph.D. .......... British Columbia
Shover, Neal, Ph.D. .................. Illinois
Wallace, Samuel E., Ph.D. ............. Minnesota

Associate Professors:

Cable, Sherry, Ph.D. ................ Penn State
Jaleta, Asafa, Ph.D. ................. SUNY (Binghamton)
Jones, Robert E., Ph.D. ............. Washington State
Kurth, Suzanne B., Ph.D. ....... Illinois (Chicago)

Assistant Professors:

Bui, Hoan, Ph.D. ................. Michigan State
Shefner, Jon, Ph.D. ................. California (Davis)

The Sociology Department offers graduate study leading to the Master of Arts and the Doctor of Philosophy. The M.A. program includes a thesis and non-thesis option. The graduate program has concentrations in criminology; energy, environment, and resource policy; and political economy. The criminology concentration includes 505, 551, 653, and 655. The energy, environment and resource policy concentration includes 560, 563, 661, and 665. The political economy concentration includes 504, 540, 541, 543, 644, and 645. Both the master's and the doctoral program allow for the construction of individualized programs of study. Detailed information may be obtained from the Programs and Curriculum Committee in Sociology. New students are admitted in fall semester only and applications must be received by the Graduate Student Services Office by February 1.

ADMISSION REQUIREMENTS

1. Acceptable scores on the general Graduate Record Examination (verbal, quantitative, and analytical) are required.
2. Three letters of recommendation (forms may be obtained from the department).
3. Completion of the appropriate previous degree (baccalaureate, preferably with a major in one of the social sciences, for the M.A. program; master's degree in one of the social sciences for the doctoral program).

THE MASTER'S PROGRAM

Thesis Option

A minimum of 30 hours beyond the baccalaureate degree, including 24 hours of coursework and 6 hours of Thesis 500, is required. Students must complete Sociology 521, 531, Statistics 531, and one foundation course (504, 505, or 560). At or near the end of all coursework, the student must take an oral examination on course material and thesis. The examination will be administered by the student's committee.

Non-Thesis Option

A minimum of 30 hours of coursework is required, including Sociology 521, 531, Statistics 531, and one of the following: 504, 505, or 560. Sociology 534, 622, and Statistics 532 are recommended. 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 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 department's Programs and Curriculum Committee. Students are encouraged to prepare a paper 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. Sociology courses at the 400 level may also be taken with the approval of the student's committee.

THE DOCTORAL PROGRAM

Coursework

Twenty-four hours of coursework beyond the master's degree are required (exclusive of S/NC 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 Programs and Curriculum Committee. Sociology courses at the 400 level may not be taken without the consent of the student's advisor and the Programs and Curriculum Committee. Six hours may be taken in related fields without petitioning the Programs and Curriculum 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 Graduate Student Services.

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 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.

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 Administrative Services Assistant in the Office of Graduate Admissions.
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 changing roles and statuses have 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. (Same as Legal Studies 455.)

459 White-Collar Crime (3) Distinctive nature and dynamics of white-collar crime, victims and costs of white-collar crime, organizational strategies as white-collar offenders, causal theories, and dynamics of responses to white-collar crime by private and public parties.

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.)

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

502 Registration for Use of Facilities (1-15) 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 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 society.

531 Research Methods in Sociology (3) Research design, measurement, sampling, quantitative and qualitative data collection techniques, data, reduction, and analysis.

534 Advanced Sociological Analysis (3) Underlying assumptions and strategies used by sociologists in formulating explanations; foundations of sociological research strategies and techniques.

540 Occupations (3) Occupations in relation to individuals and society, technology, 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 structures 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.)


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.

599 Readings (3) Selected topics. May be repeated. Maximum 6 hrs.

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

622 Sociological Theory II (3) Distinct schools of sociological theory and contributions of their principal exponents. Prereq: 521 or consent of instructor.

629 Supplementary Readings in Sociological Theory (3) Individual guidance. Preparation for comprehensive examination. Prereq: Consent of instructor. S/NC only.

633 Survey Design and Analysis (3) Systematic exploration of statistical problems through student participation in design and analysis of survey. Prereq: 531 or consent of instructor. (Same as Child and Family Studies 633.)

636 Field Research (3) Research experience in selected field sites using techniques of interviewing, participant observation, and other methods of field research. Prereq: 531 or consent of instructor.

639 Supplementary Readings in Methodology (3) Individual guidance. Preparation for comprehensive examination. Prereq: Consent of department. S/NC only.

644 Political Sociology (3) Critical examination of theories of state and political processes.

645 Advanced Studies in Political Economy (3) Topical seminar. Prereq: 504 or consent of instructor. May be repeated. Maximum 6 hrs.

649 Supplementary Readings (3) Prereq: Consent of department. May be repeated. Maximum 6 hrs. S/NC only.

653 Sociology of Law (3) Intensive examination of selected topics in sociology of law. Prereq: 505 or consent of instructor.

655 Advanced Studies in Criminology (3) Intensive examination of selected topics in criminology. Recommended prereq: 505. May be repeated. Maximum 6hrs.

661 Theory and Methods of Human Ecology (3) Historical and contemporary studies of interaction between humans and their environment. Prereq: Consent of instructor.

665 Advanced Studies in Energy, Environment and Natural Resources Policy (3) Topical seminar covering particular lines of research and theory within area. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

675 Advanced Studies in Social Psychology (3) Selected contemporary research issues related to social psychological theories. Prereq: 541 or consent of instructor. May be repeated. Maximum 6 hrs.

695 Advanced Special Topics (3) Topic of special interest or student-initiated courses that will not be regularly offered. Prereq: Consent of department. May be repeated. Maximum 6 hrs.


Spanish

See Modern Foreign Languages and Literatures

Speech Communication

(College of Communications)

MAJORS DEGREES

Communications ....................... M.S., Ph.D.

John W. Haas, Head

Professors:

Julian, Faye D. (Liaison), Ph.D. .... Tennessee Lester, Lorayne W., Ed.D. ............ Tennessee Yeomans, G. Allan (Emeritus), Ph.D. ........................................ Louisiana State University

Associate Professors:

Ambrester, M. L., Ph.D. .............. Ohio State Cook, N. C., M.A. ..................... Alabama Glenn, Robert W., Ph.D. ... Northwestern University Haas, John W., Ph.D. ................... Kentucky

Assistant Professors:

Ambler, R. S., Ph.D. .................... Ohio State Halone, Kelby K., Ph.D. ............... Oklahoma 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 language can effect changes in the knowledge, the understanding, the ideas, the attitudes, or the behavior of other human beings.

GRADUATE COURSES

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.)
Statistics

(College of Business Administration and Intercollegiate Program)

MAJORS

Statistics .................................................. M.S.
Business Administration ............................... 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
Parr, William C., Ph.D. ............................... Southern Methodist
Philpot, John W. (Emeritus), Ph.D. .......................... VPI
Sanders, Richard D. (Emeritus), Ph.D. ........................ Texas Sylvania
Sylvester, David L. (Emeritus), Ph.D. ....................... Stanford
Thigpen, Charles C. (Emeritus), Ph.D. ........................ VPI

Associate Professors:
Leitnaker, Mary G., Ph.D. ..................Kentucky
León, Ramón V., Ph.D. ................................. Florida State
Seaver, William L., Ph.D. ............................. Texas A&M
Walker, Esteban, Ph.D. ........................................ VPI
Younger, M. S. (Liaison), Ph.D. ............................. VPI

Assistant Professors:
Bensmail, Halima, Ph.D. ..................... Paris
Kim, Hyunjoong, Ph.D. ................................. Wisconsin

Additional Intercollegiate Program Faculty:
Aikens, Charles, Engineering; Bates, Ben, Communications; Bunting, Dewey, Arts and Sciences; Carnell, Paula, Human Ecology; Chang, Hui, Business Administration; Chatterjee, Arun, Engineering; Eastwood, David, Agricultural Sciences and Natural Resources; Gant, Michael, Arts and Sciences; Glisson, Charles, Social Work; Gross, Louis, Arts and Sciences; Huck, Schuyler, Education; James, Law, Business Administration; Ladd, R. T., Business Administration; Lounsbury, John, Arts and Sciences; Lyons, William, Arts and Sciences; McLemore, Dan, Agricultural Sciences and Natural Resources; Melford, Linda, Nursing; Miller, Mark, Communications; Orme, John, Social Work; Rajput, Balam, Arts and Sciences; Rosinski, Jan, Arts and Sciences; Samejima, Fumiko, Arts and Sciences; Saxton, Arnold, Agricultural Sciences and Natural Resources; Schmidhammer, James, Business Administration; Singletary, Michael, Communications; Smith, Julius, Arts and Sciences; Wagner, Carl, Arts and Sciences; Xiong, Jie, Arts and Sciences.

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 experience 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. Departamental 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 melitnaker@utk.edu or http://www.bus.utk.edu/stat.

Admission Requirements

General admission requirements for graduate study 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 programs 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 program 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 Hours in Approved IGSP Courses

Master’s in home department, minor in Statistics 9

Master’s in home department, M.S. in Statistics 24

Doctorate in home department, minor in Statistics 15
Doctorate in home department. 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 Examination 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 IGSP Executive Committee. The program will specify the sequences 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 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.

For information contact myounger@utk.edu or http://www.bus.utk.edu/stat/igsp.

BUSINESS ADMINISTRATION CONCENTRATION
For complete listing of program requirements see Business Administration.
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 take place while students are exposed to coursework in the basic functional areas of business.

Minimum course requirements are: 592, 662, 663, 664, 691, and two courses chosen from 666, 673, 674, 679.

CERTIFICATE IN APPLIED STATISTICAL STRATEGIES

The Department of Statistics offers a certificate program in applied statistical strategies. The design of the certificate is for the part-time student, and several of the courses 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 chair.

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 he/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 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) P/NP only. E

502 Registration for Use of Facilities (1-15) 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


531 Survey of Statistical Methods I (3) Univariate and bivariate data collection and organization, statistical estimation and hypothesis testing; analysis of relationships for categorical and numerical data, including Chi-square test and goodness of fit test; one-way, factorial, blocking, and nested designs, planned versus post-hoc contrasts. Random factors and repeated measures. Prereq: 537 or 532. Sp

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 major statistical computing system. Probability and probability distributions, forming and testing hypotheses using parametric and nonparametric inference methods. Matrix-based 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- and two-way factorial, blocking, and nested designs, preplanned versus post-hoc contrasts. 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 SAS 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 245. F

564 Theory of Statistical Inference (3) Introductory theory underlying common statistical procedures of hypothesis testing and estimation. Prereq: 563. Sp

566 Statistical Techniques in Industrial Processes (3) Applications of control charts and other statistical techniques to industrial management. Use of variables control charts, process capability analysis, aspects of sampling, statistical tolerancing, estimation of variance components, problems of measurement, special industrial applications. Prereq: 571 or equivalent. F


573 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 factorials, sequential designs. Prereq: 571. Sp

575 Applied Time Series (3) Fundamental concepts of time series analysis: Box-Jenkins approach, stationary and nonstationary models, forecasting model identification, seasonal and trend models, transfer function models, and spectral theory. Prereq: 538 or 572 or consent of instructor. Sp

578 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, or consent of instructor. Sp


583 Special Topics in Applied Statistics (1-3) May be repeated. Maximum 9 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. Department of Statistics and of student’s minor program. Prereq: Consent of statistics department director of graduate studies. May be repeated. Maximum 2 hrs. S/NC 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: 4 courses in graduate-level statistics or consent of statistics department director of graduate studies. May be repeated. Maximum 6 hrs. S/NC 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/NC or letter grade.

595 Statistical Consulting Practicum (1-6) Supervised experience 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 and/or detailed diaries. Prereq: 572 or 538. May be repeated. Maximum 6 hrs.


673 Advanced Topics in Design of Experiments and Linear Models (3) Experimentation for product and process improvement: response surface methodology and robust design methods; mixture experiments; optimal design topics; distribution theory and inference for linear models. Prereq: 573 or consent of instructor.


677 Statistical Modeling (3) Modern techniques of statistical modeling: predictive, likelihood, Bayesian, and information-based model selection and evaluation 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 analysis, informational tests of significance with multivariate data, multivariate analysis of variance, multivariate regression and variable selection, multivariate cluster analysis, covariance principal component model, factor analysis model, covariance structural models with latent variables, mixture-model analysis. Prereq: Matrix algebra and 564, or matrix-based linear models with experience in interactive computing, or consent of instructor.

683 Special Topics in Statistics (1-3) Presentation of specialized topics in statistics. May be repeated. Maximum 6 hrs.

691 Graduate Seminar in Applied Statistics (3) Reading of literature and discussion of open problems of importance to industry; design of experiments, modeling, process control, regression, and reliability. Prereq: Consent of instructor. S/NC or letter grade.

693 Independent Study (1-6) Directed research on subject of mutual interest to student and faculty member. May be repeated. Maximum 6 hrs.

Theatre

(College of Arts and Sciences)

MAJOR

DEGREE

Theatre ....................................................... M.F.A.

Blake Robison, Head

Professors:

Black, W., M.F.A. ........................................ Illinois
Custer, M., M.F.A. .......................................... Wisconsin
Lester, L. W., Ed.D. ........................................ Tennessee

Associate Professors:

Graven, E. H., M.A. ........................................ Tennessee
DeCuir, L. J. (Liaison), M.F.A. ......................... Tulane
Gould, B. K., M.F.A. ...................................... Catholic
Weber, T., M.F.A. .......................................... Alabama

Assistant Professors:

Gabriel, D., M.F.A. ....................................... Ohio State
Heil, M., M.F.A. .......................................... Texas
Speas, B., M.F.A. ........................................ Virginia
Van den Berg, Klaus, Ph.D. ............................ Indiana
Yeager, K., B.F.A. ....................................... Penn State

The Department of Theatre offers the Master of Fine Arts degree with a major in Theatre, concentrations in costume design, performance, lighting design, scene design, and theatre technology. Not all areas of concentration accept applicants every year. UT Theatre maintains an active presence on the international theatre scene through the engagement of distinguished guest artists, touring to foreign theatre festivals, participation in international conferences, and other educational initiatives. 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 performance 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 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.

In addition to the core requirements listed above, each area of concentration has specific requirements:

For detailed information about the graduate program, contact the Director of Graduate Studies, Department of Theatre.

Theatre 189

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 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.

In addition 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.

Performance

At least 12 hours each of 520 Master Class in Performance: Acting; 523 Master Class in Performance: Movement; and 525 Master Class in Performance: Voice. Coursework in this concentration is conducted in a conservatory environment. In the third year, students are expected to intern with either the resident professional Clarence Brown Theatre Company or another regional professional theatre.

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 up 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 Graduate Studies.

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) Visual and structural relationships in theatrical design.

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.
Advanced Theatre Costume Design (3) Costume as expressive element in dramatic production. Prereq: 345 or consent of instructor.

Advanced Costume Construction (3) Advanced studies in construction technique, tailoring, vacuum forming, paper molding, and cobbling. Prereq: 345 or consent of instructor.

Costume Patterning (3) Draping patterns for period costumes, corsery and study of historic patterns 1500-1900. Prereq: 345 or consent of instructor.

Advanced Scenery Technology I (3) Study and practice of theatre woodwork, production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

Advanced Scenery Technology II (3) Study and practice of metalworking and plastics for theatrical productions. Production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

Advanced Scenery Technology III (3) Study and practice of stage rigging for theatrical productions; production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

Scenery Painting (2) Introduction to materials, techniques, and principles of craft. Gaining skill and understanding through studio experience. Prereq: Consent of instructor.

Rendering (3) Techniques in monochrome and full color illustration of space and form. Prereq: Acquaintance with basic mechanical perspective and freehand sketching.

Advanced Lighting Design (3) Advanced problems in lighting design and theory, lighting musical theatre, opera, and dance. Prereq: 352 or consent of instructor.

Computer Assisted Design for Theatre (3) Advanced techniques in computer assisted design for theatre. Work with 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.

Playwriting (3) Advanced instruction in writing of plays. Prereq: Consent of instructor.

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

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

Introduction to Graduate Research in Theatre (3) Research tools and methods for theatre artist and scholar. Prereq: Consent of instructor.

Use of Facilities (1-15) 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

Studies in Theatre History (3) Intensive study of selected topics in theatre history. May be repeated. Maximum 9 hrs.

Dramatic Literature Analysis (3) Dramaturgical strategies of major playwrights, using variety of analytical approaches from Aristotelian to deconstruction.

Master Class in Performance : Acting (3) Master class in acting techniques. Theatre MFA students only. May be repeated. Maximum 18 hrs.

Master Class in Performance : Movement (3) Master class in movement techniques. Theatre MFA students only. May be repeated. Maximum 18 hrs.

Master Class in Performance : Voice (3) Master class in voice and speech techniques. Theatre MFA students only. May be repeated. Maximum 18 hrs.

Projects in Play Directing (3) Practical work in play direction involving various lengths and kinds of scripts. May be repeated. Maximum 9 hrs.

The Social History of Costume (3) Study and analysis of costume as related to society’s manners and mores, architecture and furniture.


Millinery for the Stage (2) Pattern making and construction techniques for hats from antiquity to present. Prereq: Consent of instructor.

Advanced Costume Patterning (3) Advanced studies in patterning period costume. Development of historic patterns through flat pattern method. Prereq: 446.

Painting and Dyeing for the Theatre (3) Fibers, dyes and dye processes; color matching and distressing.

Projects in Costume Technology (1-3) Individualized studies in costume technology in theatre production. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.


Structural Design for Stage (3,3) Application of advanced theatre technology and analysis of common building materials to design of safe stage scenery. Must be taken in sequence.

Projects in Scenic Design (1-3) Conception and completion of major projects, both hypothetical and actual, in scenic design. May be repeated. Maximum 9 hrs.

Studies in Scenic Design (3) Advanced scene design techniques and approaches to design for complex dramas and varied dramatic forms. May be repeated. Maximum 6 hrs.

Model Building (3) Techniques of model building for scenic designer. Theatre MFA students only. Prereq: 401 and one semester of 580.

Drafting (3) Drafting techniques for scenic designer. Theatre MFA students only. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

Special Problems in Lighting Design (3) Advanced problems in lighting design and theory, problems in Broadway production and touring. Prereq: 462 or consent of instructor.

Design and Technical Production Seminar (1-3) Selected aspects of design and technical production. Prereq: Consent of instructor. May be repeated. Maximum 18 hrs.

Technical Design (3) Technical problems and solutions in scenery construction using traditional and modern techniques with application of unusual materials, consideration of budgeting, safety, and structural integrity. Prereq: 551-552.

Production Planning (3) Theatre management techniques useful in structuring orderly, effective production: survey of applicable computer programs.

Stage Machinery (3) Design of safe, effective machinery for movement of stage scenery. Prereq: 551-552.

Production Workshops (1-6) Directed experience in production collaborations. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

Project in Lieu of Thesis (1-6) Available to theatre MFA students only. Prereq: Minimum of 30 hrs toward MFA degree and consent of advisor. May be repeated. Maximum 9 hrs.

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

MAJORS

- DEGREES

  Education: M.S., Ed.S., Ed.D., Ph.D.
  L. Knight, Head

  Professors:
  Benner, Susan M., Ed.D. .......... Columbia
  Brozo, William G., Ph.D. ........ South Carolina
  Christensen, Mark A. (Emeritus), Ph.D. .......... Kansas
  Davis, A. R., Ph.D. ............ Ohio State
  Davis-Wiley, Patricia, Ed.D. .......... Houston
  Hargis, Charles H. (Liaison), Ed.D. .......... Colorado State
  Harris, G. A., Jr. (Emeritus), Ph.D. .... Michigan
  Hatch, J. Amos, Ph.D. .......... Florida
  Huff, P. (Emeritus), Ph.D. .......... Ohio State
  Hull, Howard N. (Emeritus), Ed.S. .......... Peabody
  Jost, Karl 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
  Turner, T. N., Ed.D. .......... Penn State
  Watkins, J. Paul (Emeritus), M.S. .... Tennessee
  
  Associate Professors:
  Barclay, McLaughlin, Ph.D. .... Michigan
  Cagle, Lynn C., Ed.D. .......... Georgia
  Chance, Charles A., Ph.D. .......... Ohio State
  Gilrane, Colleen P., Ph.D. .......... Illinois
  Hannum, Michael G., Ed.D. .......... Northern Colorado
  Hodge, R. L., Ph.D. .......... Texas
  Judge, Sharon L., Ph.D. .......... California (Santa Barbara
  Melear, Claudia T., Ph.D. .......... Ohio State
  Puckett, Kathleen S., Ph.D. .......... Tennessee
  
  Assistant Professors:
  Bell, Sherry M., Ph.D. .......... Tennessee
  Hendricks, D. A., Ph.D. .......... Alabama
  Rearden, Kristin T., Ph.D. .......... Texas A&M
  Taylor, Mark P., Ph.D. .......... Missouri

  The Department is accredited by the National Council for the Accreditation of Teacher Education.
The early childhood education area focuses on the preparation of teachers for the education of all young children in inclusive settings. The context in which children live (i.e., urban, rural) influences their development and learning. Young children are defined as children from birth to age eight, including children living in poverty, those of color, with disabilities, with recent trends and current materials and methods in teaching, 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.

504 Diagrams and Interpretation of Child’s Difficulties in Learning Mathematics (3). Children’s difficulties in learning mathematics and procedures for helping children learn correct difficulties. Prereq: 526 or equivalent or consent of instructor. Sp.

524 Teaching for Creative Thinking and Expression (3). Prerequisite: 521 or equivalent or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

554 Assessment in Early Childhood Education (3). Development of knowledge and skills in appropriate formal and informal assessments of handicapped infants and young children; screening, identification, diagnosis, assessment, and programming for children. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

557 Application of Theory in Early Childhood Education (K-3) (3). Principles and practices in teaching children’s work. Prereq: At least one language arts course in language arts or consent of instructor. Sp, Su.


584 Seminar in Early Childhood Education (3). Analysis of research and trends in early childhood education; curricular, educational, and social foundations related to goals of students’ programs. May be repeated. Maximum 6 hrs. Sp, Su.

Elementary Education

Note: See Mathematics, Reading, Science, and Social Science Education for additional Elementary Education courses.

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 Use and Construction of Instructional Materials for Teaching Art (3). Examination and construction of curriculum and instructional aids related to teaching strategies in art education.

Early Childhood Education

GRADUATE COURSES


471 Early Childhood Special Education (6). Assessment, curriculum planning and development and teaching approaches used in early childhood special education. Prereq: Admission to teacher education. F

515 Seminar (1-3). Curriculum, instructional technology, elementary education, secondary education, or social foundations 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. May be repeated. Maximum 9 hrs.

566 Curriculum for Early Childhood Education (K-3) (3). Theoretical foundations and current research in content and skills areas of curriculum for kindergarten to third grade; application to local school setting. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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.

568 Early Childhood Special Education: Theories and Interventions (3). Theoretical perspectives for early childhood special education; exploration of programmatic models, family-focused concepts and curriculum development.

584 Seminar in Early Childhood Education (3). Analysis of research and trends in early childhood education; curricular, educational, and social foundations related to goals of students’ programs. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.


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.

507 Teaching Poetry Grades 7-12 (3). Design and use of strategies and materials for teaching and writing and reading of poetry. Review of texts and materials. F.

508 Teaching Composition in the Secondary School (3). Teaching narrative, description, exposition, and expression.
argumentation; writing process and marking of student papers. Sp
509 Teaching Fiction in the Secondary School (3) Teaching of novels and short stories. F
521 Interdisciplinary Aesthetics (3) Discussions, visual and audio presentations concerned with aes-
thetic considerations of areas of study: geography, history, physics, literature, languages, music, visual
arts and drama. 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
592 Linguistics and the Teaching of English (3) Grammar, usage, semantics, dialectology, history of
language, and lexicography. Su
597 Teaching Drama Grades 7-13 (3) Strategies and
materials for teaching creative dramatics, enacting
and writing of plays, reading of scripts. Sp
598 Developing Speaking and Listening Skills, Grades 7-12 (3) Teaching approaches to nonverbal
communication, interpersonal and group communicat-
ion. F,A
601 Studies in English Education (3) Issues and
research in teaching of English. Su

Foreign Language/ESL Education

GRADUATE COURSES
455 Teaching of Foreign Languages, Grades 7-12 (3) Instructional methods, lesson planning, peer-teach-
ing; materials for teaching foreign language and cul-
ture; evaluation techniques. Required for certification in modern foreign languages and Latin. Prereq: Com-
pletion or near completion of foreign language hours for certification and Admission to teacher education. F
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. Sp
556 English as a Second Language Practicum (3) Experiences designing, implementing and assessing English instruction to non-native English speakers. Required course for ESL certification. Prereq: 578 or consent of instructor. Sp
578 Teaching English as a Second Language (3) Instructional methods; utilization of assessment pro-
cedures to diagnose English linguistic proficiency; materials for non-native speaker in K-12 classroom. Required for Tennessee ESL (K-12) licensure. Prereq: 587 or consent of instructor. Sp
587 Teaching Foreign Languages in Secondary Schools (3) Advanced instructional techniques and evaluation procedures: materials analysis and preparation; trends, issues, and research in modern foreign languages and Latin. Prereq: Consent of instructor. Sp
678 Advanced Studies in English as a Second Language (3) Research, curricula, assessment, trends and issues in English as a second language. Prereq: 578 or consent of instructor. Sp
687 Advanced Studies in Foreign Language Educa-
tion (3) Research, curricula, assessment, trends and issues in foreign language education. Prereq: 587 or consent of instructor. Sp

Mathematics Education

GRADUATE COURSES
485 Teaching Mathematics, Grades 7-12 (3) Prepa-
ratio of teaching plans, evaluation, materials for teaching mathematics; teaching simulation and di-
rected observation in schools. Prereq: Admission to teacher education. F
522 Programs and Materials in School Mathematics (3) Examination, development and use of materials for creating an active learning environment for learning mathematics for all ages. Prereq: 485, 530, 543, or equivalent. Su
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 mathemat-
ics. F,S,A
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. F,S,A
550 Mathematics Assessment (3) Processes for assessing, making curricular and instructional deci-
sions based upon and reporting student achievement. Interpretation and use of existing assessment data. Methods of assessment: traditional tests, performance tasks, portfolios, exhibitions. Prereq: 581 or equivalent. Sp,A
581 Mathematics Curriculum (3) Past, present and future issues influencing mathematics curriculum in schools, elementary through college. Teacher’s role in curriculum development and implementation. Ration-
ales for curriculum decisions. Prereq: 485, Elementary Education 505, or equivalent. Su
583 Teaching Mathematics in Senior High Schools and Community Colleges (3) Topics appropriate for high school and community/junior college mathem-
atics curriculum. Special problems related to enrich-
ment, problem solving, and use of microcomputers. Opportunities for special projects. Prereq: 485 or equivalent. Sp
622 Research Trends in Mathematics Teacher Edu-
cation (3) Analysis of current research trends in mathematics teacher education and impact of such research on development of teachers both preservice and inservice. Prereq: Minimum 9 hrs of 500-level Math Ed courses.
683 Advanced Studies in Mathematics Education (3) Analysis of current research in mathematics edu-
cation and implications for research for classroom practice. Prereq: Two graduate courses in mathematics education.

Reading Education

GRADUATE COURSES
430 Elementary and Middle School Developmental Reading Instruction (2-3) Word recognition (including phonics), comprehension, evaluation, and materials. Open to students with recent course in reading methods. Prereq: Admission to teacher education. F,Sp
434 Topics in Reading Education (1-6) Prereq: Admission to teacher education and course in reading education. May be repeated. Maximum 6 hrs. E
461 Developing Reading Skills in Content Fields (3) Techniques for teaching reading and study skills in content areas of school program. Extensive as-
essment of textbooks. Middle school and high school. E
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. F,S
533 Reading in Community College: Research and Theory (3) Analysis of components of effective community college reading programs. Attention to research bases. Prereq: Course in reading education or consent of instructor. F
534 Seminar in Reading Education (1-6) May be repeated. Maximum 6 hrs. E

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. F
506 Science Education Studies in Natural Environ-
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. Su
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. Su
572 Nature of Mathematics and Science Education (3) Teaching and assessment of mathematics and science knowledge based upon student conceptions of nature of mathematics and science. Su
596 Curriculum Trends in Science Education (3) Analysis of elementary and secondary curriculum
projects for biological, physical and environmental sciences. Impact of current learning theories on future curriculum development projects. Prereq: 496, or Early Childhood Education 422 Early Childhood Teaching Methods, or equivalent. Prereq or coreq: 565 or consent of instructor. Sp

628 Advanced Studies in Science Education (3) Analysis of current research in science education and implications of research for classroom practice. Prereq: 596. May be repeated. Maximum 6 hrs. Sp,A

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. Sp,A

Social 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 teaching plans 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. Sp

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. Sp

585 Teaching Secondary School Social Studies (3) Strategies, projects, materials, and programs in social studies. Prereq: Undergraduate course in teaching of social studies. F,Su

599 Seminar in Social Studies Education (3) Research, trends, and issues in secondary social studies. Su

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: Research course in teaching of social studies or consent of instructor. E

Special Education

GRADUATE COURSES

419 Psychology and Education of Students with Mild Disabilities (6) Nature and characteristics of persons with mild handicaps and educational strategies appropriate for these persons. Prereq: Special Education Principles, Special Education Strategies, and admission to teacher education program. Coreq: 420, F

420 Field Experience in Modified Programs (3) Practicum in teaching in modified programs: planning, developing, implementing and evaluating instruction. Prereq: Special Education Principles, Special Education Strategies, and admission to teacher education program. Coreq: 420. S/NC only. P

431 Field Experience in Comprehensive Programs (3) Prereq: Recent course in Special Education Principles, Special Education Strategies, and admission to teacher education program. Coreq: 430. S/NC only.

432 Psychology and Education of Students with Moderate/Severe Disabilities (6) Nature and characteristics of persons with moderate/severe disabilities and educational strategies appropriate for those persons. Prereq: Special Education Principles, Special Education Strategies, and admission to teacher education program.

454 Education of the Gifted and Talented Children (3) Orientation to psychometric and behavioral studies of giftedness. Analysis of past and present school program in relation to curriculum and program implementation. Sp

456 Speech and Language Basis of Learning Disabilities in the Classroom (3) Normal communication development; understanding of speech and language delivery methods; and systematic integration of oral/written communication skills into existing curriculum, especially for high incidence special education students.

470 Psychology of the Exceptional Child (3) Varieties of exceptional conditions 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/NC 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/NC only.

553 Assessment of Exceptional Students (3) Current issues related to assessment; advanced study of evaluation models for special education; dynamic and eclectic assessment approaches; introduction to study of application to educational programming; basic statistics and application in assessment.

555 Characteristics of Affective/Motivational Functioning in Children with Disabilities (3) Definition, measurement, identification and symptoms of children with affective/motivational development in disabled youth. Comparison to normal development and that of children labeled disturbed or behavior disordered.

556 Instructional Systems for Affective/Motivational Education of Children with Disabilities (3) Educational strategies and models of instruction; simulation, demonstration, and media. Teaching techniques, materials, and teacher/pupil/family interactions. Therapeutic forms of education through art, music, role play, puppetry, bibliotherapy, and group interactions. Prereq or coreq: 555 or consent of instructor.

557 Positive Preventive Discipline (3) Instructional classroom and preventive/proactive strategies for use in classroom which positively effect 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 concerns (e.g., autism). 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 maladjustment. 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) Individualized systems and methods of instruction 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 Education Students (3) Special education students 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 all categories of exceptionalities and across all chronologic and functioning age ranges. Microcomputer adaptation to individual student, special needs, authoring systems, telecommunication, and strategies for cognitive development.

620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional organizations involved in educational research in public school, institutions, agencies or university settings. Prereq: 9 hrs in statistical and research methods. May be repeated. Maximum 9 hrs. S/NC only.

630 Internship in Institutional Leadership in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitioner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

Theory and Practice in Teacher Education

GRADUATE COURSES

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

502 Registration for Use of Facilities (1-15) 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. P


517 Trends and Issues in Education (3) Examination of contemporary trends and issues in education.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

526 Drama and Story Telling in Teaching (3) Use of techniques of drama and storytelling to improve impact of teaching and to teach more effectively. Prereq: Classroom experience or admission to teacher education program.

550 Action Research and Practical Inquiry in Education (3) Principles of action research and practical inquiry for practitioners in early childhood and school settings and methods for conducting such inquiries in professional role. Prereq: Admission to graduate program.

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

596 Clinical Experience in Assessment and Instruction (3) Academic remediation applied in lab/field setting; tasks related to teaching: assessment, preparation of lessons, and delivery of instruction. Coreq: 553. S/NC or letter grade. F

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

604 Seminar in Curriculum and Instruction (1) Required 2 consecutive semesters. S/NC only. E

610 Internship in College Teaching and Supervision (3-9) Supervised practice in college teaching and supervision. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

617 Trends and Issues in Teacher Education—An Interdisciplinary Perspective (3) Current trends and issues in field of teacher education. Elementary education, mathematics education, science education and social science education. Prereq: Admission to doctoral program or consent of instructor. Sp

620 Research in Literacy, Language, and ESL Education (3) Recent trends and historical traditions in language and literacy research: analysis of nature of research methods used, questions asked and topics
Transportation

See Marketing, Logistics and Transportation

Urban and Regional Planning

(University of Arts and Sciences)  

MAJOR DEGREE

Planning ............................................. M.S.P.

C. W. Minkel, Head

Professors:
Johnson, David A. (Emeritus), Ph.D. ... Cornell
Kenney, Kenneth B. (Emeritus),
Ph.D. ............................................. North Carolina
Minkel, C. W., Ph.D. ................... Syracuse
Minkel, C. W., Ph.D. ................... North Carolina
Minkel, C. W., Ph.D. ................... Syracuse
Shouse, Walter L. (Emeritus), M.C.P. Harvard
Spencer, James A. (Liaison),
M.C.P. ....................................... Ohio State

Associate Professor:
Tonn, Bruce, Ph.D. ..................... Northwestern

Assistant Professors:
Jepson, Edward, Ph.D. ............... Wisconsin
Shupp, Teresa, M.S.P. ................. Tennessee
Zanetta, Maria C., Ph.D. ............. Ohio State

The Department of Urban and Regional Planning offers a program of courses leading to the professional degree of Master of Science in Planning. The degree is the normal route for entry into professional positions in urban and regional planning or related fields. Graduates are candidates for positions in regional, city, county, and metropolitan planning agencies; in local, state, and federal agencies concerned with physical, economic, and administrative planning; in private business and organizations dealing with development problems; and in private consulting.

The Master of Science in Planning program is accredited by the Planning Accreditation Board, a joint undertaking of the American Institute of Certified Planners and the Association of Collegiate Schools of Planning.

THE MASTER’S PROGRAM

Admission Requirements

Applicants are to submit an application for admission to the Office of Graduate Admissions and two letters of reference from faculty familiar with their prior academic work and a statement describing personal career objectives directly to the department. If the applicant has prior work experience in planning, a reference letter should also be provided by the work supervisor. Graduate Record Examination scores are required of all applicants whose undergraduate GPA is below 3.0. Other applicants are encouraged to submit them. Students who have not taken an appropriate undergraduate statistics course will be required to take one.

Degree Requirements

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, 515, 520, 521, 530, 531, 532, 538 and 540.

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 courses from a prescribed set 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, 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 must 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.

Successful completion of a comprehensive examination is required before graduation. The exam will normally be taken after completion of the core requirements in the second year. 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 in-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 Administrative Services Assistant in the Office of Graduate Admissions.

Planning

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.)


446 Housing (3) Nature and demand for housing in U.S. and abroad. 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) P/NP only. E

502 Registration for Use of Facilities (1-15) 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 (3) History of planning, structure and development of urban areas, operations of contemporary planning, trends and issues.

515 Theory of Planning (3) 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 structure of research in planning practice; familiarity with structure of planning literature information sources, systematic retrieval techniques, processes and tools; practice imposing 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 and evaluation 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.

530 Planning Policy Analysis (3) Basic methods of policy analysis and planning. Economic factors underlying the dynamics of change in cities and regions. Coreq: 520 or consent of instructor.

531 Land Use Analysis (3) Concept and framework for land use analysis. Population, employment, economic base studies and forecasting techniques.

532 Planning Methods (4) Preparation of comprehensive plans for urban areas or regions. Development of baseline data and forecasts, formulation of alternative plans and strategies, and development of plan implementation programs. Extensive laboratory experience. Prereq: 510, 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 alternative 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 analyzing community development. Legal tools of planning. Prereq: 510 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 real estate development and its relationship to planning. Partnership roles of public and private sectors in urban development and redevelopment. Prereq: 510 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 areas.


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 552.)

553 International Planning (3) Alternative development models. Comparative analysis of planning processes and policies around world. Population growth, urbanization, environmental degradation, and economic development in developing countries.

555 Environmental Planning (3) Role of planners and planning in maintenance of balance between natural and built environment. (Same as Ecology and Evolutionary Biology 555.)

556 Futures Planning (3) Overview of world and community futures literature. Skills in trends assessment, scenario writing, and other futures planning techniques.

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.

560 Practicum (3) Prereq: Consent of instructor. S/NC or letter grade.

591 Special Topics (1-3) Prereq: Consent of instructor.

592 Readings in Planning (1-3) Prereq: Consent of instructor. May be repeated.

593 Problems in Planning (1-3) Prereq: Consent of instructor.

VETERINARY MEDICINE
(College of Veterinary Medicine)

MAJOR DEGREE

Veterinary Medicine ....................... D.V.M.
Comparative and Experimental Medicine ........... M.S., Ph.D.

THE PROFESSIONAL PROGRAM

Admission Requirements

To qualify for admission to the professional program of the College of Veterinary Medicine, a candidate must have completed at least the minimum preprofessional course requirements listed below. These may be completed at any accredited college or university that offers courses equivalent to those at The University of Tennessee. Preprofessional course requirements must be completed by the end of spring term of the year in which the student intends to enroll. Biochemistry requirements must have been satisfactorily completed within five years of the time the applicant wishes to enter the program.

Subject Area Semester Hours

English 6
Humanities and Social Sciences* 18
Physics 8
General Chemistry 8
Organic Chemistry 8
Biochemistry** 4
General Biology 8
Genetics 6
Cellular Biology** 3
TOTAL 66

*May include, for example, courses in English literature, speech, music, art, philosophy, religion, language, history, 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 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, 2002 from the Office of the Associate Dean, The University of Tennessee, College of Veterinary Medicine, 2407 River Drive, Room A102, Knoxville, TN 37996-3550.

Note: The deadline for receipt of the completed application materials is November 1. NON-TENNESSEE APPLICANTS MUST HAVE A MINIMUM CUMULATIVE GRADE-POINT AVERAGES 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, two, and three. 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 special pathology. 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 is required to complete two externships (preferably off-campus).

Innovative features of this curriculum include: six weeks of student centered, small group, applied learning exercises in semesters one through five; 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 may register for up to 10 credit hours of graduate courses and these hours will be credited toward the D.V.M. degree. Elective study offers a unique educational alternative for students in the CVM and is intended to enhance professional growth, concentration in an area of interest and career opportunities.

In addition to education in the science and art of veterinary medicine, students receive instruction in paramedical subjects such as animal behavior, medical communication, professional ethics, jurisprudence, economics, and practice management.

THE GRADUATE PROGRAM

The College also administers a graduate program involving all departments which leads to the Master of Science and 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, physiol-
ogy, 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 interdisciplinary training that prepares graduates 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. Week-long sessions based on specific clinical case or problem, and integration of basic science and clinical content. S/N/C only.

804-05-06 Application Based Learning Exercise (ABLE) and Clinical Exposure I, II, III (2,2,2) Week-long small group and individual 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. S/N/C only.

811 Infection and Immunity II—Bacteriology and Mycology (3) Fundamental aspects of microbiology and cell biology relative 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 I—Immunology (2) Basic biology and practical aspects of immunology: cells of immune system, immune function and dysfunction, immune related diseases, testing 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 provoking discussion of current veterinary ethical issues. 816—Student-led discussions follow faculty presentations.


821-22 Veterinary Anatomy I, II (4,4) 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 development, anatomy related to normal anatomy to inherited anomalies.

823-24 Physiology I, II (4,4) Introduction to concepts and problems in physiology which form basis for clinical applications and for formal training in pharmacology, medicine, and surgery. Cellular, neural, cardiovascular, renal, respiratory, digestive, endocrine, and reproductive physiology.

827 Special Problems in Animal Science (1-8) Extramural and specially designed study for students interested in select topics in anatomy, histology, and physiology.

831 Physical Diagnosis (1) 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 determinants 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 illustrative clinical cases.


836 Toxicology (2) Principles of toxicology, molecular mechanisms, pathologic processes and clinical features of animal causes 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 muscular 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 systems: 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 specialty services: ophthalmology and neurology. Direct responsibility for diagnosis, patient care, and treatment of patients in both Large Animal and Small Animal Clinical Sciences.

861 Pharmacology I (2) Principles of pharmacokinetics and pharmacodynamic properties of veterinary drugs; mode of action and pharmacologic effects including important metabolic aspects, chemical and physical properties, side effects (toxicities) and clinical application.

862 Pharmacology II (2) Continuation of 861: modes of action, pharmacologic effects, and clinical application of drugs to control specific disease conditions.

864 Infectious Diseases (2) Pathogenesis and clinical findings of major viral, bacterial and fungal diseases and infectious diseases of domestic animals: cattle, horses, swine, sheep, goats, dogs and cats; relevant case-based presentations.

865 Clinical Rotation in Comparative Medicine (2) Clinical training in avian medicine, laboratory animal, and zoo animal medicine, epidemiology, public health, and other related disciplines.

867 Special Problems in Comparative Medicine (1-8) Extramural and specially designed study for students interested in select topics in morbid pathology, clinical pathogenesis, comparative medicine, laboratory animal medicine, zoo animal medicine, epidemiology, public health, pharmacology or toxicology.

868 Introduction to Animal Behavior (2) Basic principles of normal and abnormal animal behavior in domestic animals; clinical case discussions to illustrate common behavioral problems and current approaches to therapy.

870 Anesthesiology (4) Clinical training in sedation and anesthesia of companion animals, food animals and horses. Direct responsibility for diagnosis, care and treatment of clinical patients.

871 General Pathology (3) Principles of pathobiology: causes of disease, disturbances of cell growth and inflammation.

873 Infection and Immunity IV—Parasitology (3) Principles of parasitology: protozoology, helminthology, and entomology and relationship to diseases in animals.

874 Oncology (2) Fundamental aspects of cell biology and pathology relative to etiology and natural behavior of various neoplasms of animals; general approaches to diagnosis, treatment and prevention of neoplasia.

877 Special Problems in Pathology (1-8) Extramural and specially designed study for students interested in select topics in morbid pathology, clinical pathology, clinical microbiology and parasitology.

878-79 Elective Clinical Rotation I, II (2,2) Special rotations in applied clinical education in Small Animal Clinical Sciences, Large Animal Clinical Sciences, Comparative Medicine and Pathology. Novel experience not associated with required clinical rotations may be arranged.

881 Clinical Rotations in Small Animal Clinical Sciences (1-8) Extramural training in medicine, surgery and specialty disciplines for companion animals. Direct responsibility for diagnosis, care, and treatment of clinical patients.

882 Clinical Rotations in Small Animal Clinical Sciences II (4) Clinical training in medicine, surgery and specialty disciplines for companion animals. Direct responsibility for diagnosis, care, and treatment of clinical patients.

883 Clinical Rotations in Small Animal Clinical Sciences III (4) Clinical training in medicine, surgery and specialty disciplines for companion animals. Direct responsibility for diagnosis, care, and treatment of clinical patients.

886-89 Clinical Rotation in Radiology and Pathology I, II (4,4) Two weeks in each discipline. Clinical training in radiographic techniques and interpretation, including ultrasonography. Post-mortem examination and comparative diseased pathology and histologic and introductory histopathology of biopsy specimens.

887 Special Problems in Small Animal Clinical Sciences (1-8) Extramural and specially designed
study for students interested in select topics in medicine, surgery, anesthesiology, radiology and medical specialties of small (companion) animals.

890 Transition and Accreditation Seminars (2) Discussion of USDA, state, and local animal laws and regulations: preparation of animal movement forms, veterinary ethics, jurisprudence, basic practice management, and other topics involved in practice of veterinary medicine.

891 Clinical Rotations in Large Animal Clinical Sciences I (4) Clinical training in medicine, surgery, specialty disciplines and herd health of food animals and horses. Direct responsibility for diagnosis, care and treatment of clinical patients.

892 Clinical Rotations in Large Animal Clinical Sciences II (4) Clinical training in medicine, surgery, specialty disciplines and herd health of food animals and horses. Direct responsibility for diagnosis, care and treatment of clinical patients.

893 Clinical Rotations in Large Animal Clinical Sciences III (4) Clinical training in medicine, surgery, specialty disciplines and herd health of food animals and horses. Direct responsibility for diagnosis, care and treatment of clinical patients.

897 Special Problems in Large Animal Clinical Sciences (1-8) Extramural and specially designed study for students interested in select topics in medicine, surgery, herd health, reproduction, radiology and medical specialties of large animals.

898-99 Externship I, II (2,2) Educational experiences in private practice, research facility, zoological preserve, aquarium, or other veterinary-related facility outside Veterinary Teaching Hospital; to provide experiences not frequently available in large referral veterinary teaching hospitals.
FACILITIES FOR RESEARCH AND SERVICE
Facilities for Research and Service

Bureau of Evaluation, Research, and Service
(College of Education)

Ian R. H. 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 Appalachian Rural Systemic Initiative, Center for Literary Studies, Center on Deafness, Institute for Assessment and Evaluation, LRE for Life Project, Off-campus Program, Regional Rehabilitation Continuing Education Program, Southeastern High School Equivalency Program (Migrant Education), and Teacher Internship Program.

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. CBER has a staff of three senior research faculty and a support staff in areas of research, information technology and information dissemination, and 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 Center is a major outreach activity of the University of Tennessee and a key link between the business community and the College of Business Administration. Through short-and long-term business relationships, the Center partners with companies to provide ongoing education for managers, carry out research, and exchange leading edge ideas.

The non-degree programs provided to the business community include general management programs, programs for process improvement, programs in lean enterprise practices and programs in supply chain management. They range in length from one week to four weeks.

A prominent feature of the programs is their applied nature. Through projects, assignments and workshops, participants use courses to analyze their organizations and implement immediate changes.

Much of the Center’s work is customized to the needs of individual companies and provided at their sites in the U.S. or abroad.

Additional information about the Center for Executive Education can be found at http://TheCenter.utk.edu.

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
(College of Education)

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) forming 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 leading 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 e-mail at dixielee@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 interdisciplinary staff includes over 120 full-time researchers and technicians augmented with numerous faculty and students. The Center is presently organized into five major divisions: Logistics and Systems Analysis; Infrastructure and Environment; Safety and Traffic Operations; Mobility Services and Policy; and Information Technology.

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 sustain the technical expertise for high quality transportation research by the faculty and students 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 of 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

The Centers of Excellence grew out of Tennessee’s Better Schools Program, an initiative to upgrade state-aided education at all levels. State officials and legislators wanted to give a few outstanding academic programs in state-aided universities a special push toward prominence, well beyond regular annual increases for all programs. 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:

Knoxville
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 of 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 Transportation
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
Bernadette E. Schmitt Chair of Excellence of History

Memphis

Maury W. Bronstein Chair of Excellence in Cardiovascular Physiology
Crippled Children’s Hospital Foundation Chair of Excellence in Biomedical Engineering
William and Dorothy Dunavant Chair of Excellence in Pediatrics
Federal Express Chair of Excellence in Pediatrics
First Tennessee Chair of Excellence in Clinical Pharmacy
Thomas A. Gerwin Chair of Excellence in Physiology
Goodman Chair of Excellence in Medicine
J. R. Hyde Chair of Excellence in Rehabilitation Engineering
Le Bonheur Chair of Excellence in Pediatrics
E. Erick Muirhead Chair in Pathology
Plough Foundation Chair of Excellence in Pediatrics
Second Le Bonheur Chair of Excellence in Pediatrics
Sennes-Murphey Chair of Excellence in Neurology
Mark S. Solloway Chair of Excellence in Urology
Harriet S. Van Vleet Chair of Excellence in Biochemistry
Harriet S. Van Vleet Chair of Excellence in Microbiology and Immunology
Harriet S. Van Vleet Chair of Excellence in Pharmacology
Harriet S. Van Vleet Chair of Excellence in Virology
UT Medical Group Chair in Obstetrics and Gynecology

UTSI
H. H. Arnold Chair of Excellence in Computational Mechanics
Boling Chair of Excellence in Space Propulsion

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 premiere university in the state and as a regional and national leader in instruction, research, and public service is enhanced as a result of the infusion of these special funds. For information concerning the individual centers sponsored by UT, contact:

Center for Laser Applications
Dr. Narendra Dahotre, Chairman
Space Institute
B. H. Goethert Pkwy
Tullahoma, TN 37388-8897
(931) 393-7474
(jlewis@utsi.edu)

Center of Excellence for Computer Applications (CECA)
Dr. Clinton Smullen, Director
UT Chattanooga
124 Grote Hall
Chattanooga, TN 37403
(423) 755-4787
(csmullen@cecasun.utc.edu)

Center of Excellence for Livestock Diseases and Human Health
Dr. Robert N. Moore, Director
UT College of Veterinary Medicine
Veterinary Teaching Hospital
Knoxville, TN 37996
(865) 974-5750
(ovriga@utk.edu)

Center of Excellence for Materials Processing
Dr. Carl McHargue, Director
University of Tennessee
513 East Stadium Hall
Knoxville, TN 37996-2351
(865) 974-0816
(crl@utk.edu)

Center of Excellence for Neuroscience
Dr. Stephen Kitai, Director
UT Health Science Center
855 Monroe Avenue
Memphis, TN 38163
(901) 448-5957
(skitai@utmem.edu)

Center of Excellence for Pediatric Pharmacokinetics and Therapeutics
Dr. Richard A. Helms, Director
UT Health Science Center
800 Madison Avenue
Memphis, TN 38163
(901) 448-6034
(rhelms@utmem.edu)

Center of Excellence for Science and Mathematics Education
Dr. Preston Prather, Director
UT Martin
205G Gooch Hall
Martin, TN 38238
(731) 587-7163
(jpprather@utm.edu)

Molecular Resource Center of Excellence
Dr. Michael E. Dockter, Director
UT Health Science Center
62 S. Dunlap, Suite 400
Memphis, TN 38163
(901) 448-7105
(mdockter@utmem.edu)

The Science Alliance
Dr. Jesse Poore, Director
University of Tennessee
101 South College
Knoxville, TN 37996
(865) 974-6765
(jpoore@utk.edu)

Waste Management Research and Education Institute
Dr. Gary Sayler, Director
University of Tennessee
676 Dabney Buehler
Knoxville, TN 37996-0845
(865) 974-8080
(sayler@utk.edu)

Child Development Laboratories
(College of Human Ecology)
Anne Miller Stott, Director

The Child Development Laboratories, operated by the Child and Family Studies department within the College of Human Ecology since 1927, currently offer early education programs for young children ages six weeks to five years. The Child Development Laboratories serve three purposes: to promote observation, participation, and research activities of the department and other university faculty; to prepare undergraduate and graduate child development professionals for working effectively with young children; and to provide a model early childhood education program for children, families and early childhood professionals. The programs are equipped with videotaping capabilities in all classrooms, small group research rooms, and observation booths that facilitate teacher preparation and research. A variety of research projects (such as the development of creativity in young children, emergent literacy, children’s political socialization, mainstreaming, and peer interactions) involves students and faculty in the college and many departments on campus. Graduate Assistants in the Laboratories participate in teaching, assessment, administrative, supervisory and research activities while working with children and families under the guidance of faculty and staff. 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 more information, check Web site at http://web.utk.edu/~utkcdl/.

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 communication; (2) to disseminate research-generated information; and (3) to provide research services to faculty and students, professional communicators, and others interested in improving the quality of human communications.

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 interdisciplin ary 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 Research 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. Brit, 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 mechanic 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 citizens of Tennessee. Thus the Institute of Agriculture has come to include the work of four main divisions: Agricultural Experiment Station; Agricultural Extension Service; College of Agricultural Sciences and Natural Resources, and College of Veterinary Medicine.

Agricultural Experiment Station

C. A. Speer, Dean

The Agricultural Experiment Station was established by the Board of Trustees of the University of Tennessee in 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 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 marketing 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 uses on natural resources and the environment as they relate to long-term productivity and 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 supports over 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 family and consumer science information to citizens in the state.

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, family and consumer science, 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 four districts with supervisors located in their respective districts. District headquarters are maintained in Knoxville, Crossville, 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.
The Map Library (Room 15, basement of the Hoskins Library, Cumberland Ave. & 15th St.) houses 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 such as rare books, manuscripts, and historical ephemera. The University Archives are also housed here. The Archives contain official records of the University; items published officially and unofficially by its units, departments, and agencies; and other materials that document University of Tennessee life. Materials from Special Collections are pagged for library users from closed stacks for use in the Reading Room.

The Social Work Library (Room 292, 193-E Polk 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. Byerley, 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. In addition to the technology, 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 and reliability 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)

Kelsey Cook, 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 sponsored 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 research has created a situation within which 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 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.

**Off-Campus Graduate Centers**

**KINGSPORT GRADUATE PROGRAM**

UT offers at Kingsport graduate programs in engineering and Human Resource Development at the master’s level.

Students who enroll in these programs must be admitted to graduate study at UT. Information and application forms may be obtained from the ETSU/UT at Kingsport, 1501 University Boulevard, Kingsport, Tennessee 37660.

**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.

Students who enroll in this program must be admitted to graduate study at UT. Information and application forms may be obtained from the UT/UTC Graduate Center, UTC, 120 Race Hall, Chattanooga, Tennessee 37403.

**COLLEGE OF SOCIAL WORK**

UT offers a fully accredited two-year program leading to the Master of Science in Social Work through the College of Social Work, with programs in Knoxville, Nashville, and Memphis.

The UT College of Social Work also offers a Doctor of Philosophy with a major in Social Work.

For complete information concerning the programs, see Social Work under Fields of Instruction.

**Office of Information Technology**

The Office of Information Technology (OIT) provides computing and telecommunications resources and services for students, faculty, and staff. Information about OIT is available on the OIT web site http://oit.utk.edu.

OIT provides the core information technology equipment and services for The University of Tennessee. OIT 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. These accounts may be used for e-mail, coursework, research, and personal Web pages. Information and on-line registration for computer accounts are available at http://oit.utk.edu/helpdesk/account. Students are also encouraged to download and use AntiVirus software supplied by OIT at no cost to the student.
Students on the Knoxville campus may access the Internet through direct Ethernet, wireless, or dial-up accounts. Students living in the on-campus Residence Halls are each provided with a switched 10Mb Ethernet connection. For off-campus students, the Enhanced Remote Access (ERA) pool is provided by 756 modems supporting 56 Kbps analog and 64Kbps/128Kbps ISDN connections. All students can take advantage of UT's new wireless infrastructure available in most of the academic and administrative buildings on campus.

To provide access to computing facilities on campus, OIT maintains seven staffed computing labs, several unstaffed labs, and supports computing installations in residence halls. The computing labs are equipped with more than 300 microcomputers including current models of Apple, Dell, and Gateway machines. In addition, there are laser printers, scanners, CD-Writers 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://oit.utk.edu/labs.html for more information.

**OIT HELP DESK**

OIT provides the telephone Help Desk as a centralized source of information and service for the computer and network resources managed by OIT. Help Desk services are available to all UT students. Students may call the HelpDesk with questions in such areas as your e-mail, Internet usage and Web page design, ERA account setup and billing, desktop hardware and software, wireless and ResNet connectivity, and UNIX account. The HelpDesk phone number is 974-9900. You may also contact the HelpDesk by sending your questions via e-mail to helpdesk@utk.edu.

**OIT CUSTOMER SERVICE CENTER**

OIT maintains a Customer Service Center that centrally locates all contact points for walk-in support on related OIT services. Students can receive assistance and/or training on a wide variety of topics at our Customer Service Center. Just an example of some of the services offered include registering for an e-mail account, signing up for an ERA account, getting an Ethernet or wireless card installed, resetting a password, training on how to construct Web pages, and learning how to download or transfer files across the network. We will also help students learn how to download and use virus protection programs as well as help students with other applications like My Blackboard, TELNET, and WebMail. The Customer Service Center is located on the corner of Cumberland and Volunteer in rooms 103/104 Aconda Court and is open Monday through Friday, 9 a.m. until 4 p.m.

**ENHANCED REMOTE ACCESS (ERA) AND SUPPORT**

Any UT student, staff, or faculty member can obtain an ERA account that will give them access to the Internet, as well as UT's computing facilities, from home. OIT supports approximately 6,000 users of ERA. Currently OIT provides up to 128K ISDN connections and 56K analog connections. The Enhanced Remote Access office is located in room 103 of Aconda Court at the corner of Volunteer and Cumberland. The ERA staff will help you set up your account as well as provide technical assistance either over the phone (via the Help Desk 974-9900) or for walk-in customers.

**RESNET CONNECTIONS**

OIT has wired every dorm room on campus for network access. The ResNet community enjoys a dedicated 45 Mbit DS-3 connection to the commodity internet. Each network port in the room is a 10Mb dedicated Ethernet connection. Students living in the dorms with network capable computers will be connected free of charge. Students with computers that do not have network cards installed may obtain a network card at a reduced price. Technicians are available to install and configure the network card free of charge at the Customer Service Center in Aconda Court.

**TECHNOLOGY TRAINING**

Several courses are offered aimed at improving skills with the technology available at UT. 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, Dreamweaver, JavaScript, 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. Please refer to http://web.utk.edu/~training for more information.

**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.), 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 UTK students. For registration and access to the CBT courses on the WEB go to http://oit.utk.edu/cbt/.

**STATISTICAL CONSULTING CENTER**

The mission of the Center is to help people enhance the quality of their research by working together to effectively apply statistical, graphical and computing techniques. We assist UT students, faculty and staff researchers. The costs for most of our services are centrally funded for the first ten hours of assistance each semester. Beyond that the student or department would be billed. Services offered include software support, research planning, data access and management, analysis and interpretation, and presentation of results. For details, see http://oit.utk.edu/scc/.

**OIT WEB SITE AND DOCUMENTATION**

The OIT WEB page provides you with access to information about, and access to, our many OIT services. It is located at http://oit.utk.edu/. This information includes The Life Preserver, a manual to help you get started using your UNIX account and sending/receiving e-mail, quick reference guides, and frequently-asked-questions (FAQ) Web pages.

**CAMPUS PHONE AND CABLE TV**

OIT provides telephone services for students living on-campus in residence halls and off-campus in University resident apartments. OIT also provides students full cable TV service at an affordable price. Cable TV service shows new releases, movie classics, and much more over channels such as ESPN, MTV, BET, History, VTV-33 Movies. Please refer to http://oit.utk.edu/services.html for more information.

**THE INNOVATIVE TECHNOLOGIES CENTER (ITC)**

The ITC (http://itc.utk.edu) enriches the educational experience of UTK 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 UTK faculty, academic teaching staff, and graduate teaching assistants. In addition, the ITC provides Online@UT, the university's fully integrated online academic community of course materials, campus-based services and resources, and university organizations with an online presence. For more information, please refer to http://online.utk.edu.

**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 Centers of Excellence**

In 2000, the University of Tennessee created nine Research Centers of Excellence in a competitive process that sought to emphasize some of the strongest, most promising research taking place at the university. With financial support from the state of Tennessee, the nine centers have created vital research programs that promise to enhance the university's teaching and research and to contribute positively to the state economy. The five centers in Knoxville are in environmental biology, food safety, materials science, information technology, and
structural biology, Memphis has four centers: genomics, neurology of brain diseases, diseases of connective tissue, and vascular biology. Several of the programs involve activities on the various UT campuses and collaboration with Oak Ridge National Laboratory.

CENTER FOR GENOMICS AND BIOINFORMATICS

Daniel Goldowitz, Director

The CGB, located in at the UT Health Science Center in Memphis, is committed to fostering an atmosphere conducive to scientific research and collaboration in the area of functional genomics, involving both basic science and clinical departments across the campuses of the University of Tennessee.

CENTER FOR INFORMATION TECHNOLOGY RESEARCH (CITR)

Jack Dongarra, Director

The Center for Information Technology Research (CITR) was established in the spring of 2001 to drive the growth and development of leading-edge information technology research (ITR) at the University of Tennessee. The mission of CITR is to build a thriving, well-funded community in basic and applied ITR at the University of Tennessee in order to help the university capitalize on the rich supply of research opportunities that exist in this area.

CENTER FOR EXCELLENCE FOR THE NEUROBIOLOGY OF BRAIN DISEASE

Stephen Kitai, Director

The Center for the Neurobiology of Brain Disease works to improve the diagnosis, treatment, and prevention of neurological and psychiatric disorders. The center combines state-of-the-art technologies for brain disease research and molecular biology to improve understanding of brain function and the underlying reasons for neurological disorders ranging from Parkinson's and Huntington's diseases to schizophrenia and drug addiction.

CENTER FOR ENVIRONMENTAL BIOTECHNOLOGY

Gary Sayler, Director

The Center for Environmental Biotechnology (CEB) was established in 1986 to foster a multidisciplinary approach toward training the next generation of environmental scientists and solving environmental problems through biotechnology. The CEB was given Research-Center-of-Excellence status by the University of Tennessee in order to catalyze and advance a new research agenda that pushes the envelope of creative and pioneering research. This fundamental new research will revolutionize the ability to design, monitor, and control processes at the molecular level to achieve real-time information and computational analysis in complex bienvironmental systems.

FOOD SAFETY CENTER OF EXCELLENCE

Ann Draughon & Stephen Oliver, Directors

The Food Safety Center of Excellence was established in December 2000. The center develops and evaluates strategies to destroy or control food-borne pathogens and reduce the occurrence of food-borne illnesses. Contributing to this work is a multidisciplinary team of researchers, consisting of members of UT's Institute of Agriculture's Department of Food Science and Technology as well as researchers from departments outside the institute. Specialists include scientists with expertise in biochemistry, reproductive biology, food service management, parasitology, infectious diseases and risk assessment.

VASCULAR BIOLOGY CENTER OF EXCELLENCE

Lisa K. Jennings, Director

The Vascular Biology Center of Excellence at the University of Tennessee Health Science Center (UTHSC) in Memphis was initiated in January 1999. The study of cellular and integrated vascular function under normal and pathologic conditions is the major research focus of the UT Vascular Biology Center of Excellence. The major collaborations formed by the participating faculty and trainees, along with the TAM (Tennessee, Arkansas, Mississippi) Cardiovascular Network of more than 70 cardiologists, creates an innovative and powerful research consortium.

CENTER OF EXCELLENCE FOR DISEASES OF CONNECTIVE TISSUE

Andrew Kang, Director

The Center for Diseases of Connective Tissue is located at the UT Health Science Center in Memphis. Scientists at the center conduct basic research in five areas: autoimmune diseases, such as rheumatoid arthritis and lupus; degenerative diseases, such as osteoarthritis; inflammation and the basic science of how the body reacts to injury; fibrotic diseases, such as heart failure and emphysema; and clinical research. The center also educates and trains pre- and postdoctoral fellows and conducts outreach programs.

THE TENNESSEE ADVANCED MATERIALS LABORATORY (TAML)

Ward Plummer, Director

The Tennessee Advanced Materials Laboratory (TAML) calls on experts in materials science and engineering, chemistry, chemical engineering, and physics at UT and the Oak Ridge National Laboratory to explore the creation of new materials through computer-intensive modeling and experimental research.

CENTER OF EXCELLENCE IN STRUCTURAL BIOLOGY

Engin Serpersu, Director

The mission of the UT Center of Excellence in Structural Biology (CESB) is to expand the frontiers of knowledge in biomolecular structural and functional research. The center brings together a large group of structural molecular biologists working on a wide range of biological molecules, biomolecular assemblies and complexes. Its participants represent specialties in all of the current major techniques for high-resolution structure determination of large molecules, including X-ray crystallography, NMR spectroscopy and a battery of sophisticated biophysical tools including mass spectrometry and other spectroscopic techniques.

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. Since 1946, students and faculty of UT have benefited from its membership in ORAU. ORAU is a consortium of 86 colleges and universities and a 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 and to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, 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, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, 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 underrepresented 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 ORISE Catalog of Education and Training Programs, which is available at http://www.orau.gov/orise/resgd.htm.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, and various services to chief research officers.

For more information about ORAU and its programs, contact: Dr. Lee Magid, (865) 974-1407; Ms. Monnie E. Champion, (865) 576-3306; or visit the ORAU website at http://www.orau.org.

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 correspond to research activities to be conducted at CEBAF (i.e. nuclear and related particle physics, accelerator physics, and associated scientific and engineering fields).

Nonwovens research programs at UT include specialty textiles 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 colleges of Engineering and Arts and Sciences.

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 industry for testing purposes. The TANDEC laboratory hosts numerous guests from industry and other institutions, and the facilities are planned to meet their needs, while safeguarding research confidentiality.

**Tourism Institute**
(Prepared by the Department of Urban and Regional Planning and the College of Agricultural Sciences and Natural Resources)

**Nancy Fair, Director**

The Tourism Institute at UT uses a systems approach to enhance economic development in Tennessee and the Southeast Region. Centered 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 Department of Urban and Regional Planning and the College of Agricultural Sciences and Natural Resources.

Successful tourism requires attractions to draw tourists and supporting 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 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 tourism 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 degree programs in the department and assists the industry in workforce training.

**University of Tennessee Space Institute**

John E. Caruthers, Chief Operating Officer and Dean for Academic Affairs

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, and mathematics. 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 30 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, Electrical Engineering, Engineering Science, Industrial Engineering (engineering management concentration), Mathematics, Mechanical Engineering, Materials Science and 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, energy conversion processes, thermal sciences, coal combustion, magnetohydrodynamics, plasma physics, space systems, propulsion, computational fluid dynamics, and other aspects of atmospheric and space flight.

The Institute has established a Center of Excellence in Laser Applications and offers graduate study 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 engineering 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 graduate study at The University of Tennessee. Graduate Research Assistantships are available for qualified students. Further information may be obtained from the Dean of Academic Affairs, The University of Tennessee Space Institute, Tullahoma, Tennessee 37388.
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 departments to offer courses, educational services and programs to students, teachers and faculty. The division offers programs 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 seven departments: Department of Conferences, Department of Distance Education and Independent Study, English Language Institute, University Evening School, UT New College, 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) 974-3181, FAX: (865) 974-6629, E-mail: outreach@utk.edu, Website: www.outreach.utk.edu.

The University Evening School 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.

Courses meet 3-5 days each week 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, 907 Mountainside 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
Gayle Cooper, Assistant Dean and 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.

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.

Contact: UT Professional & Personal Development, 1534 White Ave., Knoxville, TN 37996-1526, Phone: (865) 974-0154, 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 internet-based, web-delivered classes, and programs leading to certificates and degrees. The School of Information Sciences and the College of Engineering offer Master’s degree programs through web-based courses, while the Departments of Nuclear Engineering and Statistics offer courses leading to degree and certificate programs. Other undergraduate and graduate classes and programs are in development, and a variety of individual courses in many disciplines are available. Current course availability can be found on the Web at anywhere.tennessee.edu.

The department provides services and support for faculty, students, and industry interested in flexibly-delivered education. 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, web mastering, 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, 1534 White Avenue, Knoxville, TN 37996-1525, Phone: (865) 974-9311 or (800) 670-8657, FAX: (865) 974-6629, E-mail: DistEducation@utk.edu, Website: anywhere.tennessee.edu.

UNIVERSITY EVENING SCHOOL
M.K. Warden, Assistant Dean
The University Evening School administers on- and off-campus, undergraduate and graduate courses in a variety of nontraditional 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

Courses 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, Sport 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. Courses and instructors listed for the Mini-Term are carefully selected to reflect a broad academic base of offerings suited to an intensive program of study.
Off-Campus Programs

The Evening School conducts undergraduate and graduate courses in a number of locations away from the Knoxville campus. All course offerings and instructors are approved by the appropriate academic departments, and the credit awarded is resident credit. The Evening School has a major in Human Resource Development available in Nashville. The M.S. with a major in Education is available in Anderson, Blount, Knox, McMinn and Sevier counties. The Ed.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, Industrial, and Nuclear Engineering, as well as Safety.

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 Web, 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 Web, 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.

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 admission, may pay a reduced rate to receive regular 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: eveningschool@utk.edu, Website: www.outreach.utk.edu/evening.

SUMMER SCHOOL AND SPECIAL PROGRAMS

M. K. Warden, Assistant Dean

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, contact: Summer School, 451 Communications Bldg., Knoxville, TN 37996-0349, Phone: (865) 974-5361 or 1-800-676-8657, FAX: (865) 974-2027, E-mail: eveningschool@utk.edu, Website: www.outreach.utk.edu/evening.

Special Programs

The University of Tennessee offers a number of special programs on its Knoxville campus. Many of Special Programs’ activities may be of interest to K-12 teachers and students.

Southern Appalachian Science and Engineering Fair: The Fair brings between 400 and 500 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 800 alumni in 21 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, 410 Hoskins Library, Knoxville, TN 37996-4012, Phone: (865) 974-3594, Website: www.acad.utk.edu/specprog.

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.