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.

The institution reserves the right to change any provision, offering, or requirement to be effective when determined by the institution. These changes will govern current and readmitted students. Enrollment of all students is subject to these conditions. The current catalog should be referred to during each year of study. The University further reserves the right to dismiss a student from the University for cause at any time.

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, Tennessee 37996
Office Hours: 8:00 a.m.-5:00 p.m.
Monday-Friday

GRADUATE STUDIES
Anne Mayhew, Vice Provost for Academic Affairs and Dean of Graduate Studies
817A Andy Holt Tower
(865) 974-3265 E-Mail: amayhew@utk.edu

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Kay Reed, Assistant to the Dean
P105 Andy Holt Tower
(865) 974-2475 E-Mail: kayreed@utk.edu

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

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Assistantships—Head of department or program in which you plan to major
Fellowships and Scholarships—Kay Reed, Assistant to the Dean
P105 Andy Holt Tower
(865) 974-2475 E-Mail: kayreed@utk.edu

Loans, Work-Study—Jeffrey Gerkin, Assistant Dean and Director,
Scholarships and Financial Aid
115 Student Services Building
(865) 974-3131 E-Mail: jgerkin@utk.edu

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

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405 Student Services Building
(865) 974-2571 E-Mail: jgrubb1@utk.edu

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

REGISTRAR
Monique Anderson, Associate Dean and University 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

A project of Office of the University Registrar, 209 Student Services Building, Knoxville, Tennessee 37996-0220, with assistance from Creative Services, (865) 974-2225. Revisions: 6452.

Publication Authorization Number: E17-0405-002-002-03
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 education programs and services or employment opportunities and benefits. This policy extends to both employment by and admission to the University.

The University does not discriminate on the basis of race, sex, or disability in the education programs and activities pursuant to the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990.

Inquiries and charges of violation concerning Title VI, Title IX, Section 504, ADA, the Age Discrimination in Employment Act (ADEA), or any of the other above referenced policies should be directed to the Office Equity and Diversity (OED); 1840 Melrose Avenue; Knoxville, Tennessee 37996-3560; telephone (865) 974-2498 (TTY available). Requests for accommodation of a disability should be directed to the ADA Coordinator at the Office of Human Resources Management; 600 Henley Street; Knoxville, Tennessee 37996-4125.

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; The University of Tennessee; 413 Student Services Building; Knoxville, Tennessee 37996-0248.

A project of Office of the University Registrar, 209 Student Services Building, Knoxville, Tennessee 37996-0220, with assistance from Creative Services, (865) 974-2225. Revisions: 6452.

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### University Calendar for 2003-2004

#### Summer Term 2003
- June 2 (Monday) Classes Begin
- July 3 (Thursday) First Session Ends
- July 4 (Friday) Independence Day
- July 7 (Monday) Second Session Begins
- August 7 (Thursday) Second Session Ends
- August 16 (Saturday) Graduation Date*

#### Fall Semester 2003
- August 20 (Wednesday) Classes Begin
- September 1 (Monday) Labor Day
- October 16-17 (Thursday-Friday) Fall Break
- November 27-28 (Thursday-Friday) Thanksgiving Break
- December 2 (Tuesday) Classes End
- December 3, 5 (Wednesday, Friday) Study Period
- December 4, 8-11 (Thursday, Monday-Thursday) Final Exams
- December 13 (Saturday) Doctoral Hooding Ceremony
- December 14 (Sunday; 3 p.m.) Commencement

#### Spring Semester 2004
- January 12 (Monday) Classes Begin
- January 19 (Monday) Martin Luther King Holiday
- March 8-12 (Monday-Friday) Spring Break
- April 9 (Friday) Spring Recess
- April 28 (Wednesday) Classes End
- April 29-30 (Thursday-Friday) Study Period
- May 3-7 (Monday-Friday) Final Exams
- May 7 (Friday) Doctoral Hooding Ceremony
- May 8 (Saturday; 9 a.m.) Commencement
- May 10-28 (Monday-Friday) Mini Term
- May 31 (Monday) Memorial Day

#### Summer Term 2004
- June 1 (Tuesday) Classes Begin
- July 2 (Friday) First Session Ends
- July 5 (Monday) Independence Day
- July 6 (Tuesday) Second Session Begins
- August 6 (Friday) Second Session Ends
- August 14 (Saturday) Graduation Date*

*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.
## Board of Trustees

### Ex-Officio Members
- Governor, State of Tennessee
- Commissioner of Education
- Commissioner of Agriculture
- President, The University of Tennessee
- Executive Director, Tennessee Higher Education Commission

### Districts

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<th>District</th>
<th>Service Begins</th>
<th>Term Expires</th>
</tr>
</thead>
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<tr>
<td>D. Lynn Johnson, Kingsport</td>
<td>First</td>
<td>1999</td>
<td>May 31, 2005</td>
</tr>
<tr>
<td>Don C. Stansberry, Jr., Huntsville</td>
<td>Fourth</td>
<td>2002</td>
<td>May 31, 2008</td>
</tr>
<tr>
<td>Andrea Loughry, Brentwood</td>
<td>Sixth</td>
<td>1999</td>
<td>May 31, 2005</td>
</tr>
<tr>
<td>Wayman L. Hickman, Columbia</td>
<td>Seventh</td>
<td>2000</td>
<td>May 31, 2006</td>
</tr>
<tr>
<td>Jerry L. Jackson, Dyersburg</td>
<td>Eighth</td>
<td>1996</td>
<td>May 31, 2008</td>
</tr>
</tbody>
</table>

### From Anderson, Bedford, Coffee, Franklin, Lincoln, Moore, and Warren Counties
- J. Steven Ennis 1988 May 31, 2006

### From Davidson County
- R. Clayton McWhorter 1993 May 31, 2005

### From Hamilton County

### From Knox County
- Susan Richardson-Williams 1995 May 31, 2007

### From Shelby County

### From Weakley County

### Student Member
- Natalie A. Tate 2002 June 30, 2003

### Faculty Member
- Lawrence J. Hak 2002 June 30, 2003

### Officers of the Board
- Phil Bredesen, Chairman
- R. Clayton McWhorter, Vice Chairman

### Administration

- John W. Shumaker, B.A., M.A., Ph.D., President
- Cathy L. Cole, B.S., M.A., Ph.D., Acting Executive Assistant
- Steven D. Leonard, B.S., M.B.A, Executive Vice President
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- Jack E. Williams, B.S., Vice President for Development and Alumni Affairs
- Buddy Mitchell, Associate Vice President for Federal Relations
- Anne Mayhew, B.A., Ph.D., Vice Provost for Academic Affairs and Dean of Graduate Studies
- W. Timothy Rogers, B.A., M.A., J.D., Vice Provost for Student Affairs
- Clifton Woods, III, B.S., M.S., Ph.D., Vice Provost
- John Caruthers, B.S., M.S., Ph.D., Chief Operating Officer, UT Space Institute

### Colleges and Schools

- Jack H. Britt, B.S., M.S., Ph.D., Interim Dean, College of Agricultural Sciences and Natural Resources and the Tennessee Agricultural Experiment Station
- Marleen K. Davis, B.Arch., M.Arch., Dean of the College of Architecture and Design
- Stuart Riggsby, A.A., B.A., M.S., Ph.D., Interim Dean of the College of Arts and Sciences
- Jan R. Williams, B.S., M.B.A., Ph.D., Dean of the College of Business Administration
- Faye D. Julian, B.A., M.A., Ph.D., Interim Dean, College of Communication and Information
- John Koontz, B.A., Ph.D., Interim Dean, College of Education, Health, and Human Sciences
- Fred D. Tompkins, B.S., Ph.D., Interim Dean of the College of Engineering
- Thomas C. Galligan, Jr., A.B., J.D., L.L.M., Dean of the College of Law
- Joan Creasia, B.S.N., M.S.N., Ph.D. R.N., Dean of the College of Nursing
- 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
- Richard L. Bayer, B.A., M.A., Dean of Enrollment Services
- Barbara I. Dewey, B.A., M.A., Dean of University Libraries

### Independent Departments

- Colonel Marty Coffman, M.S., U.S. Air Force, Professor of Aerospace Studies, Air Force Reserve Officers Training Corps
- Lieutenant Colonel William P. Woodcock, U.S. Army, B.S., M.S., Professor of Military Science and Leadership, Army Reserve Officers Training Corps
### The Graduate Council (Membership August 1, 2002)

**Ex Officio Members**

- Dr. Anne Mayhew, Vice Provost for Academic Affairs and Dean of Graduate Studies
- Dr. Mary Albrecht, College of Agricultural Sciences and Natural Resources
- Dr. Bill Blass, Chairman of the Research Council
- Dr. John Caruthers, UT Space Institute
- Dr. Ed Caudill, College of Communication and Information
- Mr. Jon Coddington, College of Architecture and Planning
- Ms. Barbara Dewey, Dean of Libraries
- Dr. David Dupper, College of Social Work
- Dr. Sarah Gardial, College of Business Administration
- Dr. Thomas W. George, College of Education, Health, and Human Sciences
- Dr. Robert Moore, College of Veterinary Medicine
- Dr. William Dunne, College of Arts and Sciences
- Dr. Johnie Mozingo, College of Nursing
- Dr. John L. Sobieski, Jr., College of Law
- Dr. Luther Wilhelm, College of Engineering
- Dr. Robert Leiter, University Outreach and Continuing Education

### College or Unit | Elected Members | Expiration | Proxy
---|---|---|---
Agric. Sci. and Natural Resources | Dr. Robert M. Auge | July 31, 2004 | Dr. David A. Golden
Architecture and Design | Mr. Jon Coddington | July 31, 2004 | Mr. Max Robinson
Arts and Sciences | Dr. Steffi Ohnesorg | July 31, 2003 | TBD
| Dr. Carol Harden | July 31, 2003 | TBD
| Mr. Beauvais Lyons | July 31, 2003 | TBD
| Dr. Stephen Blackwell | July 31, 2004 | Dr. John Romeiser
| Dr. Charles Feigerle | July 31, 2004 | Dr. Gerald Schroedl
| Dr. Sherry Cable | July 31, 2005 | Dr. Warren Jones
| Dr. Otto Schwarz | July 31, 2005 | Dr. Mary Papke
Business Administration | Dr. Melissa Bowers | July 31, 2003 | TBD
| Dr. Richard Townsend | July 31, 2003 | TBD
| Dr. Ray DeGennaro | July 31, 2005 | TBD
Communication and Information | Dr. Roxanne Hovland | July 31, 2005 | TBD
| Dr. Gretchen Whitney | July 31, 2003 | TBD
Education, Health, and Human Sciences | Dr. Vena Long | July 31, 2003 | Dr. Mary Jane Connelly
| Dr. Kathleen Davis | July 31, 2004 | TBD
| Dr. Naima M. Moussa | July 31, 2004 | Dr. Doo Lim
| Dr. Blanche O'Bannon | July 31, 2004 | TBD
| Dr. Thomas Turner | July 31, 2005 | Dr. Songning Zhang
| Dr. Handel Wright | July 31, 2005 | TBD
Engineering | Dr. Wayne T. Davis | July 31, 2003 | Dr. Arun Chatterjee
| Dr. Paul D. Frymier | July 31, 2004 | Dr. Raymond Buchanan
| Dr. Majid Keyhani | July 31, 2004 | Dr. Belle Upadhyaya
Graduate Student Association | Mr. Sid Collins | April 30, 2003 | Mr. Chad Toney
| Mr. Patrick Shuneman | April 30, 2003 | TBD
| Mr. Sam Morton | April 30, 2003 | TBD
Law | Ms. D. Cheryn Picquet | July 31, 2003 | TBD
Nursing | Dr. Nan Gaylord | July 31, 2004 | Dr. Sandra McGuire
Social Work | Dr. Mary Rogge | July 31, 2004 | Dr. John Orme
| Dr. Marlys Staudt | July 31, 2004 | Dr. Roger Nooe
UT Space Institute | Dr. Trevor Moulden | July 31, 2004 | Dr. Monty Smith
Veterinary Medicine | Dr. Patti Tithof | July 31, 2003 | Dr. John New
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 9,300 doctoral degrees and 55,000 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.

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<thead>
<tr>
<th>Major</th>
<th>Degree</th>
<th>Concentrations Available</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College of Agricultural Sciences and Natural Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural and Extension Education*</td>
<td>M.S.</td>
<td>Agricultural education, agricultural extension education.</td>
</tr>
<tr>
<td>Agricultural Economics*</td>
<td>M.S.</td>
<td>M.S.—agribusiness, agricultural economics.</td>
</tr>
<tr>
<td>Animal Science*</td>
<td>M.S., Ph.D.</td>
<td>M.S.—animal genetics, animal health and well-being, animal management, animal nutrition, animal physiology.</td>
</tr>
<tr>
<td>Biosystems Engineering*</td>
<td>M.S., Ph.D.</td>
<td>Ph.D.—agricultural electrical and electronic systems, agricultural power and machinery, agricultural structures and environment, food and process engineering, soil and water conservation engineering.</td>
</tr>
<tr>
<td>Biosystems Engineering Technology*</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Entomology and Plant Pathology*</td>
<td>M.S.</td>
<td>Entomology, plant pathology.</td>
</tr>
<tr>
<td>Environmental and Soil Sciences</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Food Science and Technology*</td>
<td>M.S., Ph.D.</td>
<td>Ph.D.—food chemistry, food microbiology, food processing, sensory evaluation of foods.</td>
</tr>
<tr>
<td>Forestry*</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Natural Resources*</td>
<td>Ph.D.</td>
<td></td>
</tr>
<tr>
<td>Plant Sciences and Landscape Systems.*</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Plants, Soils, and Insects*</td>
<td>Ph.D.</td>
<td>Bioactive natural products, crop sciences, environmental and soil sciences, entomology, horticulture, integrated pest management, plant improvement, plant pathology, weed biology.</td>
</tr>
<tr>
<td>Wildlife and Fisheries Science*</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td><strong>College of Architecture and Design</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture*</td>
<td>M.Arch.</td>
<td>Track 1 (for students seeking first professional degree). Track 2 (for students with first professional degree who wish to develop an area of specialization).</td>
</tr>
<tr>
<td><strong>College of Arts and Sciences</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology</td>
<td>M.A., Ph.D.</td>
<td>M.A. and Ph.D.—archaeology, biological anthropology, cultural anthropology, zooarchaeology.</td>
</tr>
<tr>
<td>Art*</td>
<td>M.F.A.</td>
<td>Ceramics, drawing, graphic design, media arts, painting, printmaking, sculpture.</td>
</tr>
<tr>
<td>Audiology*</td>
<td>Au.D.</td>
<td></td>
</tr>
<tr>
<td>Biochemistry and Cellular and Molecular Biology*</td>
<td>M.S., Ph.D.</td>
<td></td>
</tr>
<tr>
<td>Botany*</td>
<td>M.S., Ph.D.</td>
<td>M.S. and Ph.D.—anatomy, bryology, cytogenetics, cytology, ecology, genetics, lichenology, molecular biology, morphology, mycology, photobiology, physiology, physiology, pteridology, systematics.</td>
</tr>
<tr>
<td>Chemistry*</td>
<td>M.S., Ph.D.</td>
<td>M.S. and Ph.D.—analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, physical chemistry, polymer chemistry.</td>
</tr>
<tr>
<td>Computer Science*</td>
<td>M.S., Ph.D.</td>
<td></td>
</tr>
<tr>
<td>Ecology and Evolutionary Biology*</td>
<td>M.S., Ph.D.</td>
<td>Behavior, ecology, evolutionary biology.</td>
</tr>
<tr>
<td>English*</td>
<td>M.A., Ph.D.</td>
<td>M.A.—writing.</td>
</tr>
<tr>
<td>French*</td>
<td>M.A.</td>
<td></td>
</tr>
<tr>
<td>Geography*</td>
<td>M.S., Ph.D.</td>
<td></td>
</tr>
<tr>
<td>Geology*</td>
<td>M.S., Ph.D.</td>
<td></td>
</tr>
<tr>
<td>German*</td>
<td>M.A.</td>
<td></td>
</tr>
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<td>DEGREE</td>
<td>CONCENTRATIONS AVAILABLE</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Interdisciplinary Programs</td>
<td></td>
<td><strong>Graduate certificate programs</strong>—linguistics, medieval studies, women’s studies.</td>
</tr>
<tr>
<td>Life Sciences*</td>
<td>M.S., Ph.D.</td>
<td><strong>M.S. and Ph.D.</strong>—genome science and technology, plant physiology and genetics.</td>
</tr>
<tr>
<td>Mathematics*</td>
<td>M.M., M.S., Ph.D.</td>
<td><strong>M.S.</strong>—applied mathematics. <strong>Ph.D.</strong>—mathematical ecology.</td>
</tr>
<tr>
<td>Microbiology*</td>
<td>M.S., Ph.D.</td>
<td></td>
</tr>
<tr>
<td>Modern Foreign Languages*</td>
<td>Ph.D.</td>
<td>First concentration—French, German, Spanish. Second concentration—applied linguistics, French, German, Italian, Portuguese, Russian, Spanish.</td>
</tr>
<tr>
<td>Music*</td>
<td>M.M.</td>
<td>Accompanying, choral conducting, composition, instrumental conducting, jazz, music education, music theory, musicology, performance, piano pedagogy.</td>
</tr>
<tr>
<td>Philosophy*</td>
<td>M.A., Ph.D.</td>
<td><strong>M.A. and Ph.D.</strong>—medical ethics, philosophy. <strong>M.A. only</strong>—religious studies.</td>
</tr>
<tr>
<td>Physics*</td>
<td>M.S., Ph.D.</td>
<td><strong>M.S. and Ph.D.</strong>—astrophysics; atomic, molecular, optical, and low temperature physics; biophysics; chemical physics; condensed matter and surface physics; elementary particle physics; mathematical and computational physics; nuclear and relativistic heavy ion physics; theoretical physics. <strong>M.S. only</strong>—geophysics, health physics.</td>
</tr>
<tr>
<td>Planning*</td>
<td>M.S.P.</td>
<td>Environmental planning, land use planning, real estate development planning, transportation planning.</td>
</tr>
<tr>
<td>Political Science*</td>
<td>M.A., Ph.D.</td>
<td></td>
</tr>
<tr>
<td>Psychology*</td>
<td>M.A., Ph.D.</td>
<td><strong>M.A.</strong>—experimental psychology, general psychology. <strong>Ph.D.</strong>—clinical psychology, counseling psychology, experimental psychology.</td>
</tr>
<tr>
<td>Public Administration*</td>
<td>M.P.A.</td>
<td>Dual J.D.-M.P.A. program available.</td>
</tr>
<tr>
<td>Sociology*</td>
<td>M.A., Ph.D.</td>
<td><strong>M.A. and Ph.D.</strong>—criminology; energy, environment and resource policy; political economy.</td>
</tr>
<tr>
<td>Spanish*</td>
<td>M.A.</td>
<td></td>
</tr>
<tr>
<td>Speech and Hearing Science*</td>
<td>Ph.D.</td>
<td>Audiology, hearing science, speech and language pathology, speech-language science.</td>
</tr>
<tr>
<td>Speech Pathology*</td>
<td>M.A.</td>
<td>Aural habilitation.</td>
</tr>
<tr>
<td>Theatre*</td>
<td>M.F.A.</td>
<td>Costume design, lighting design, performance, scene design.</td>
</tr>
</tbody>
</table>

**College of Business Administration**

| Accounting*                               | M.Acc.       | Assurance services, systems, taxation.                                                                                                                                                                                        |
| Economics*                                | M.A., Ph.D.  |                                                                                                                                                                                                                           |
| Human Resource Development                | M.S.         | Training and development.                                                                                                                                                                                                   |
| Industrial and Organizational Psychology*  | Ph.D.        |                                                                                                                                                                                                                           |
| Management Science*                       | M.S., Ph.D.  |                                                                                                                                                                                                                           |

**College of Communication and Information**

| Communication*                            | M.S., Ph.D.  | **M.S. and Ph.D.**—advertising, electronic media, journalism, public relations, science communication, speech communication. **M.S. only**—converging media. **Ph.D. only**—information sciences. |
| Information Sciences*                     | M.S.         |                                                                                                                                                                                                                           |

**College of Education, Health, and Human Sciences**

<p>| Child and Family Studies*                 | M.S.         | <strong>M.S.</strong>—child and family studies, early childhood education.                                                                                                                                                             |
| College Student Personnel*                | M.S.         |                                                                                                                                                                                                                           |</p>
<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>CONCENTRATIONS AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Services Management*</td>
<td>M.S.</td>
<td>Hospitality and tourism management, retail and consumer sciences. <strong>Certificate programs</strong>—services management, tourism development.</td>
</tr>
<tr>
<td>Counseling*</td>
<td>M.S.</td>
<td>Mental health counseling, rehabilitation counseling, school counseling.</td>
</tr>
<tr>
<td>Education</td>
<td>Ph.D.</td>
<td>Counselor education; cultural studies of educational foundations; curriculum, educational research and evaluation; early childhood education; educational administration and policy studies; educational psychology; exercise science; instructional technology; literacy, language, and ESL education; school psychology; sport studies; teacher education.</td>
</tr>
<tr>
<td>Educational Administration and Policy Studies</td>
<td>Ed.D.</td>
<td>Educational administration and policy, higher education administration.</td>
</tr>
<tr>
<td>Educational Psychology</td>
<td>M.S.</td>
<td>Adult education, applied educational psychology.</td>
</tr>
<tr>
<td>Educational Psychology and Counseling</td>
<td>Ed.D.</td>
<td>Collaborative learning.</td>
</tr>
<tr>
<td>Exercise Science</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Health Promotion and Health Education*</td>
<td>M.S.</td>
<td></td>
</tr>
<tr>
<td>Human Ecology</td>
<td>Ph.D.</td>
<td>Child and family studies, community health, hospitality and tourism management, nutrition sciences, retail and consumer sciences.</td>
</tr>
<tr>
<td>Nutrition*</td>
<td>M.S.</td>
<td>Nutrition science, public health nutrition. <strong>Dual M.S.-M.P.H.</strong> program available.</td>
</tr>
<tr>
<td>Public Health*</td>
<td>MPH</td>
<td>Community health education, gerontology, health planning/administration. <strong>Dual M.S.-M.P.H.</strong> program available.</td>
</tr>
<tr>
<td>Recreation and Leisure Studies</td>
<td>M.S.</td>
<td>Recreation administration, therapeutic recreation.</td>
</tr>
<tr>
<td>Safety</td>
<td>M.S.</td>
<td>Emergency management, safety management.</td>
</tr>
<tr>
<td>School Counseling*</td>
<td>Ed.S.</td>
<td></td>
</tr>
<tr>
<td>School Psychology*</td>
<td>Ed.S.</td>
<td></td>
</tr>
<tr>
<td>Sport Studies*</td>
<td>M.S.</td>
<td></td>
</tr>
</tbody>
</table>

**College of Engineering**

<p>| Aerospace Engineering*                     | M.S., Ph.D. | M.S. and Ph.D.—aeroacoustics, aerodynamics and performance, energy conversion and utilization, flight and aerospace mechanics, fluid dynamics, heat transfer and fluid mechanics, propulsion, space engineering, structures and stress analysis, thermodynamics. |
| Chemical Engineering*                      | M.S., Ph.D. | M.S. and Ph.D.—advanced control systems, chemical bioengineering, chemical engineering, polymer science and engineering. <strong>Certificate program</strong>—maintenance and reliability engineering. |
| Civil Engineering*                         | M.S., Ph.D. | M.S. and Ph.D.—Construction engineering, environmental engineering, geotechnical/materials engineering, public works engineering, structural engineering, transportation engineering. |
| Electrical Engineering*                    | M.S., Ph.D. | Ph.D.—circuit theory, communication theory, computers, control systems, electro-optics, electromagnetic theory, plasma engineering, power electronics, power systems, solid-state electronics. |
| Engineering Science                        | M.S., Ph.D. | M.S. and Ph.D.—biomedical engineering, computational mechanics, fluid mechanics, mechanics of composite materials, optical engineering (UTSI only), solid mechanics. <strong>M.S. only</strong>—Applied artificial intelligence, product development and manufacturing. <strong>Ph.D. only</strong>—industrial engineering. <strong>Dual M.S.-MBA program available.</strong> |
| Environmental Engineering*                | M.S.       | Air quality, environmental risk assessment, mixed waste management, waste management, water quality, water resources.                                                                                                    |</p>
<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>CONCENTRATIONS AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science and Engineering*</td>
<td>M.S., Ph.D.</td>
<td>M.S. and Ph.D.—materials, metallurgy, polymers.</td>
</tr>
<tr>
<td>Mechanical Engineering*</td>
<td>M.S., Ph.D.</td>
<td>M.S. and Ph.D.—dynamics, control and robotics; energy conversion and utilization; gasdynamics; heat transfer and fluid mechanics; machine design; power generation; propulsion; space engineering; stress analysis; thermodynamics. M.S. only—product development and manufacturing. Dual M.S.-M.B.A. program available. Certificate programs—computational fluid mechanics, maintenance and reliability engineering.</td>
</tr>
<tr>
<td>Polymer Engineering*</td>
<td>M.S., Ph.D.</td>
<td>M.S. and Ph.D.—Composite materials; mechanical, physical and chemical behavior of polymers; polymer morphology; rheology and polymer processing.</td>
</tr>
</tbody>
</table>

**College of Law**


**College of Nursing**

| Nursing*                                  | M.S.N., Ph.D. | M.S.N.—adult health nursing, family nurse practitioner, mental health nursing, nurse anesthesia, nursing administration, nursing of women and children. Post-master’s certificates—adult health nursing, family nurse practitioner, mental health nursing, nurse anesthesia, nursing administration, nursing education, nursing of women and children. |

**College of Social Work**

| Social Work*                              | M.S.S.W., Ph.D. | M.S.S.W.—clinical social work practice, social welfare management and community practice. Post-master’s certificate—management and community practice. |

**College of Veterinary Medicine**

| Veterinary Medicine*                      | D.V.M.          |                                                                                                                   |

**Intercollegiate**

| Aviation Systems*                         | M.S.            | Offered only at UT Space Institute, Tullahoma, Tennessee.                                                     |
| Comparative and Experimental Medicine*    | M.S., Ph.D.     | Basic science, applied science.                                                                                  |

* Non-degree students must obtain permission from the department/program head to register for courses in these fields.
### Summary of Procedures for Master's Degrees and Specialist in Education Degree

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission as a potential degree candidate</td>
<td>Office of Graduate Admissions and Major Department</td>
<td>Prior to completing 15 hours of graduate courses</td>
</tr>
<tr>
<td>Formation of master’s/Ed.S. committee</td>
<td>Advisor/Major Professor</td>
<td>Prior to application for admission to candidacy</td>
</tr>
<tr>
<td>Submission of application for admission to candidacy</td>
<td>Master's/Ed.S. Committee and University Registrar's Office</td>
<td>At least one semester prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>Dean of Graduate Studies</td>
<td>Prior to graduation</td>
</tr>
</tbody>
</table>

#### GRADUATION REQUIREMENTS FOR NON-THESIS OPTION

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>RESPONSIBILITY</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of application for graduation</td>
<td>Office of the University Registrar</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Scheduling of Final Examination</td>
<td>Student and Committee</td>
<td>Not later than two weeks prior to Final Examination*</td>
</tr>
<tr>
<td>Final Examination</td>
<td>Master's/Ed.S. Committee</td>
<td>Not later than three weeks prior to Commencement*</td>
</tr>
<tr>
<td>Removal of Incomplete(s)</td>
<td>Instructor of Course</td>
<td>Not later than first day of classes of term of graduation*</td>
</tr>
</tbody>
</table>

#### GRADUATION REQUIREMENTS FOR THESIS/PROBLEMS OPTION

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>RESPONSIBILITY</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of application for graduation</td>
<td>Office of the University Registrar</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Submission of thesis/problems to master’s/Ed.S. Committee</td>
<td>Student</td>
<td>At least two weeks prior to Final Examination</td>
</tr>
<tr>
<td>Scheduling of Final Examination</td>
<td>Student and Committee</td>
<td>Not later than two weeks prior to Final Examination*</td>
</tr>
<tr>
<td>Final Examination</td>
<td>Master's/Ed.S. Committee</td>
<td>Not later than four weeks prior to Commencement*</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of thesis</td>
<td>Master's/Ed.S. Committee and Graduate Student Services</td>
<td>After Final Examination and not later than two weeks prior to Commencement*</td>
</tr>
<tr>
<td>Removal of Incomplete(s)</td>
<td>Instructor of Course</td>
<td>Not later than final day of classes of term of graduation*</td>
</tr>
</tbody>
</table>

*Deadlines are printed in the **Deadline Dates for Graduation** and are available on the Graduate Studies Web Page (http://web.utk.edu/~gsinfo).
## Summary of Procedures for Doctoral Degrees

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

### GRADUATION REQUIREMENTS

| Submission of application for graduation                                | Office of the University Registrar                           | At beginning of term of graduation***     |
| Payment of graduation fee                                               | Bursar's Office                                              | At beginning of term of graduation***     |
| Submission of dissertation to doctoral committee                        | Student                                                     | At least two weeks prior to Defense of Dissertation Examination |
| Scheduling of Defense of Dissertation Examination                         | Student, Committee and Office of the University Registrar     | Not later than one week prior to Defense of Dissertation Examination*** |
| Defense of Dissertation Examination                                       | Doctoral Committee                                           | Not later than four weeks prior to Commencement*** |
| Approval and acceptance of final copy of dissertation and doctoral forms | Doctoral Committee and Graduate Student Services              | After Defense of Dissertation Examination and not later than two weeks prior to Commencement*** |
| Removal of Incomplete(s)                                                | Instructor of Course                                         | Not later than final day of classes of term of graduation* |

*The order of these items varies with individual programs.*  
**Not required in some programs.**  
***Deadline dates are printed in the Deadline Dates for Graduation and are available on the Graduate Studies Web Page (http://web.utk.edu/~gsinfo).***
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 the 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 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 (http://admissions.utk.edu/graduate/).
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 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 08540
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 graduate 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 a degree program (see Academic Standards). An applicant may not be admitted simultaneously to more than one degree program. Two or more applications cannot be considered concurrently. For admission to dual programs, applications are processed consecutively.

NON-DEGREE ADMISSION

Applicants may apply for non-degree status who, for example:

1. need additional time to fulfill application requirements for a degree program.
2. do not wish to pursue a degree program.

Minimum requirements (see Admission Requirements) must be met for admission to non-degree status. Some departments do not permit non-degree students to register for graduate courses (see Majors and Degree Programs chart for information on restricted programs). A major area must be declared if the intent is to seek an advanced degree. If no degree is desired, a major area need not be declared. Students anticipating long-term enrollment as non-degree students are advised to apply as undergraduate students in non-degree status. Students holding a degree who are taking additional work as undergraduate non-degree students may be allowed to take 600-level courses for undergraduate credit with the approval of the instructor.

Before accumulating 15 hours of coursework in graduate non-degree status, the student must apply and be admitted to a specific degree program (see Revision of Admission Classification for procedures). A maximum of 15 graduate hours may be taken in graduate non-degree status. If admitted into a degree program, no more than 15 graduate hours may be applied toward a graduate degree, if approved by the student’s committee. Courses applied toward any graduate degree must fall within the time limit specified for the degree.

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

A student must maintain a 3.0 grade-point average to continue enrollment in non-degree status (see Academic Standards). Admission to non-degree status does not constitute admission to a degree program. The student who seeks to enter a degree program will be directed to the appropriate department.

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

GRADUATE CERTIFICATE OF CREDIT ADMISSION

Admission to a graduate certificate of credit program requires that a person meet the minimum 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.

TRANSIENT ADMISSION

A student who is enrolled in good standing in a graduate degree program at another institution and who wishes to take courses for transfer to that institution may be admitted after submitting a completed Graduate
Application for Admission, the $35 application fee, and a Transient Student Certification 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 February
- Spring: 15 June
- Summer: 15 October

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 available at the Graduate Admissions web site: http://admissions.utk.edu/graduate/ or will be sent to the applicant after receipt of application.
7. Additional departmental/program requirements:
   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).

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

- Fall: 15 May
- Spring: 1 October
- Summer: 15 February

The University will not enroll any student who has not been approved initially, or for transfer, by the Immigration and Naturalization Service (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 degree from an accredited U.S. institution within the past two years are exempt from the TOEFL requirement.

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

Admission of Faculty and Staff Members

If admitted to 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 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 approval by the 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.
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/colleges 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. Senior privilege is extended only to those students working toward a first bachelor’s degree. 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 graduate 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. To receive a graduate certificate of credit, students must be admitted to a certificate program or a degree program.

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.

Auditors and Audited Courses

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

The names of all auditors properly registered will appear on the intermediate class rolls, but will be removed from the final grade report. No record of audited coursework will appear on the permanent record.

Persons may not attend class without being properly admitted to the University and registered in the class.
Courses in Non-Standard Format

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

1. The number of contact hours should never be fewer than the equivalent of one hour per week during the term for each hour of credit awarded, i.e., 15 hours per semester 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 University 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 transferable.

English Proficiency

Applicants whose native language is not English must pass an English proficiency examination given by the University prior to initial registration. Students whose performance on the examination indicates a need for additional English study must enroll immediately for English 121 English Grammar Review for Non-Native Speakers (or another course assigned by the English Department) for undergraduate credit and pass with a grade of C or better. A student may not take more than 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 anticipationships. 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 under each department. The liaison acts as a departmental contact to assist non-departmental students with course selection and other academic matters.

Registration

Registration is required of all graduate students when using University facilities and/or faculty time. The minimum number of hours for registration is 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 (http://cpu.utk.edu) 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 Office of the University Registrar, (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 for each repeatable course with the exception of Thesis 500, Dissertation 600, and Registration for Use of Facilities 502. Courses may be cross-listed with two or more departments, an arrangement indicated by a parenthetical statement: (Same as Psychology 543). The course description is given only under the primary department.

“S/NC only” indicates that the course may be taken only for Satisfactory/No Credit grading. Refer to section on Grades. The Timetable of Classes, published prior to registration for each semester, is the official notification of courses offered for a given semester. Students should contact the appropriate department/program head concerning courses to be offered in future semesters.

Change of Registration

The permanent record will show all courses for which the student has registered except those audited and those from which the student has withdrawn during the first 10 calendar days after the beginning of classes.

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

Course 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 student on a one-half time assistantship who takes six semester hours will be considered full time. Refer to the Policy for the Administration of Graduate Assistantships for additional information.

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

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

Grade-Point Average and Grades

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

A (4 quality points per semester hour), superior performance.
B+ (3.5 quality points per semester hour), better than satisfactory performance.
B (3 quality points per semester hour), satisfactory performance.
C+ (2.5 quality points per semester hour), less than satisfactory performance.
C (2 quality points per semester hour), performance well below the standard expected of graduate students.
D (1 quality point per semester hour), clearly unsatisfactory performance and cannot be used to satisfy degree requirements.
F (no quality points), extremely unsatisfactory performance and cannot be used to satisfy degree requirements.

See Timetable of Classes each term for exact dates.

A student may change registration by accessing the telephone registration system or at Circle Park Online (http://cpo.utk.edu/). If additional permission is necessary, a student must execute a change of registration at the Office of the University Registrar, with approval of the instructor, advisor and Office of Graduate Student Services.

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 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.

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

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
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 nor willingly give or receive any inappropriate assistance in academic work, thus affording 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).
- 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 exceed those 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. Differs 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.


**Degree Program Requirements**

**Transfer Credits**

Courses taken at another institution may be considered for transfer into a master’s or Ed.S. program as determined by the committee and approved by the Dean of Graduate Studies. At the doctoral level, courses are not officially transferred although they may be counted in determining the student's UT transcript only after admission to candidacy.

**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.)

**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 and will be placed on the shelf approximately one year after conferral of the graduate degree.

**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 web site. Also refer to Summary of Procedures for Master’s, Ed.S. and Doctoral Degrees.

**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 action usually connotes that all prerequisites to admission have been completed and a program of study has been approved.

The application for the master's degree is made as soon as possible after the student has completed any prerequisite courses and nine hours of graduate coursework with a 3.0 average or higher in all graduate work. The Admission to Candidacy form must be signed by the student's committee and list all courses to be used for the degree, including transfer coursework. The student must submit this form to the Office of 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 for the master's 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. The major professor should 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.

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. degree have at least one year of related work experience. Additional information on admission requirements can be obtained from academic units offering the degree.

COURSE REQUIREMENTS
The student’s program involves a minimum of four semesters of study totaling not fewer than 60 semester hours of graduate credit beyond the baccalaureate degree. A minimum of 6 hours is required outside the major academic unit or area. A student admitted to the program with a master's degree, or with acceptable work beyond the master's degree, may have program requirements modified upon recommendation of the student's committee. However, no modifications will be permitted in examination and research requirements, nor in the minimum 6 graduate hours required outside the major. All prior coursework accepted toward the degree must be related to the student’s program objectives. A maximum of 6 hours beyond the master's degree may be transferred from another institution to an Ed.S. program (refer to section on Transfer Credits).

Degree Program Requirements 21

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.
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.

EDS 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 EdS 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 523) 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 EdS degree.

Doctoral Degrees

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

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

PROGRAM OF STUDY

The student’s program of study is subject to Graduate Council policies and individual program requirements. The program of study as listed by the student on the Admission to Candidacy form must be approved by the doctoral committee. Doctoral programs include a major field or area of concentration and, frequently, one or more cognate fields. Cognate fields are defined as a minimum of 6 semester hours of graduate coursework in a given area outside the student’s major field. A candidate for a doctoral degree must complete a minimum of 24 hours of graduate coursework beyond the master’s degree, which is a prerequisite for entry into most doctoral programs. If the doctoral program does not require a master’s degree, the candidate must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. A minimum of 6 semester hours of the student’s coursework must be taken in UT courses at the 600 level, exclusive of dissertation.

In addition, 24 hours of course 600 Doctoral Research and Dissertation are required (see Continuous Registration).

For coursework taken prior to admission to the doctoral program, refer to section on Transfer Credits.

DOCTORAL COMMITTEE

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

Diagnostic Examination

A student on admission to a doctoral program may be given a written and/or oral diagnostic examination to help determine the student’s level of preparation, areas of strengths and weaknesses, and general background. The diagnostic examination is designed to aid in the selection of courses and to determine the student’s preparation to continue doctoral studies at UT.

Qualifying Examination

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

Comprehensive Examination

The comprehensive examination (or the final part of this examination, when parts are given at different times) is normally taken when the doctoral student has completed all or nearly all prescribed courses. Thus, its successful completion indicates that, in the judgement of the faculty, the doctoral student can think analytically and creatively, has a comprehensive knowledge of the field and the speciality, 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 residence requirements.

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

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. Time a student working full time 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 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.

Residency Classification for the Purpose of Paying University Fees and for Admission Purposes

Initial residency classification is determined by an Admissions Processor from information contained on the University of Tennessee Graduate Application for Admission. Notice of classification is sent at the time the applicant is notified of admission. Students classified as out-of-state, or whose status is unclear, should submit an Application for Residency Reclassification to the Residency Classification Office. The deadline for submission of the completed classification application and supporting documentation is the tenth day after classes begin for the semester. Classification will be determined and the applicant will be notified by mail. Additional information regarding the State of Tennessee regulations for classification may be found at the Office of the University Registrar website, http://web.utk.edu/~registrars/.

University Fees

For the most current listing of tuition and fees at The University of Tennessee, see http://web.utk.edu/bursar/

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

All charges and refunds will be made to the nearest even dollar. All charges are subject to subsequent audit and verification.

The University reserves the right to correct any error by appropriate additional charges or refunds.

All students must confirm their attendance by (1) making the minimum payment; (2) signing a Confirmation of Attendance form; or (3) setting their Confirmation of Attendance on the web at CPO.UTK.EDU if no fees are due.
If the student does not owe fees due to a waiver (staff, GA, GTA, GRA, etc.), financial aid including scholarships, or if fees are paid by another source, a signed Confirmation of Attendance Form must be received by the Bursar's Office or the student must set their confirmation on the web at CPO.UTK.EDU on or before the due date published in the Timetable of Classes each semester. The schedule will be canceled 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.

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

Part-time students may elect to pay fees computed by the semester hour credit (or audit) at the rate paid on the above web site, with the total charge not to exceed the regular maintenance fee for in-state students or the maintenance fee plus tuition for out-of-state students.

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

**APPLICATION FEE**

Each graduate application for admission must be accompanied by a non-refundable fee of $35 before it will be processed (fee not required if: (1) former UT graduate student; (2) paid to UT Graduate 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. Students may pay their fees via the mail, in person, or on the web at CPO.UTK.EDU. Through VOLXpress, statements are mailed to each student's billing address that include class schedules, drop/add activity, current tuition and fees, fee waiver information, fines and past-due amounts, pending financial aid that can be credited toward fees, 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 address on the web at CPO.UTK.EDU to ensure timely receipt of a VOLXpress Statement. Each Timetable of Classes lists the dates of registration and when it statements will be mailed. Failure to receive a statement does not relieve the student of their obligation to pay on or before the due date.

**UNIVERSITY PROGRAM AND SERVICES FEE**

http://web.utk.edu/bursar/volxfees.html

The purpose of the University Programs and Services Fee (UPSF) is to provide non-instructional facilities and programs of an educational, cultural, social, recreational, and service nature for The University of Tennessee students. The fee has three components which include program, health, and capital. The health portion of the fee is included only with the payment of the full UPSF (refer to Student Health Insurance and Student Health Services for additional information).

Students enrolled in nine or more hours are assessed the full-time University Programs and Services Fee. Students enrolled for less than nine hours are assessed a pro-rated fee based on the highest number of hours for which the student is enrolled at any time during the semester. The fee is non-refundable.

Graduate, teaching, and research assistants, teaching associates, and fellowship students must pay the University Programs and Services Fee even if they have a waiver of fees (tuition and/or maintenance).

Any part-time student may elect to pay the health portion of the UPSF in addition to the standard pro-rated assessment. Part-time students enrolled in six or more hours may elect to pay the full-time UPSF instead of the standard pro-rated assessment.

**TECHNOLOGY FEE**

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

Graduate, teaching, and research assistants, teaching associates, and fellowship students, who may have a waiver of fees (tuition and/or maintenance), must pay the appropriate Technology Fee. The Technology Fee is mandatory and may be refunded on the same percentage scale as maintenance and tuition charges.

**FACILITIES FEE**

The Facilities Fee is used to provide students with upgraded classroom facilities, expand information technology into the classroom, and assist in funding a backlog of campus and classroom projects that will enhance the University's facilities.

**TRANSPORTATION FEE**

The Transportation Fee is a mandatory fee assessed to all students enrolled in credit and audit courses. The fee is used to provide students with a convenient method of movement around campus. The fee will subsidize the costs associated with the new comprehensive campus transit system.

**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

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.

**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 17 credit hours are considered as one-hour courses.

**FINAL REGISTRATION LATE FEE**

Assessed to students who register during Final Registration (including those who were canceled during Priority Registration). Payment of fees or a Confirmation of Attendance form must be turned in to one of the Bursar's Office locations by the Final Registration payment due date. This due date will be published in the Timetable available from the Registration Office. The Final Registration Late Fee is non-refundable.

See the Timetable of Classes for the dates and fees to be assessed during Final Registration.

**RESTATEMENT FEE**

VOLXpress (fee) accounts which have a balance one month prior to the end of a term will be assessed a reinstatement fee, and grades will be withheld.

**RETURNED CHECK SERVICE FEE**

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 redeposited. 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, schedule of classes and check cashing/writing services. Failure to pay may also result in additional late fees, collection costs and reasonable attorney fees.

**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. All financial aid must be applied toward fees before a deferment will be considered. A deferred payment service fee is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Bursar's Office. An additional late payment fee will be assessed on each installment 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 reinstatement fee will be assessed if fees are not paid by one month prior to the end of the term.
REFUNDS

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

REFUND/CHARGE OF FEES FOR WITHDRAWAL
(DROP ALL CLASSES)

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 Office of the University Registrar, 209 Student Services Building. Failure to attend class does not automatically withdraw or drop a student from college or class.

The effective date of the withdrawal is the date the appropriate withdrawal office is notified by completion of the official withdrawal request form. The appropriate percentage of fees (maintenance and tuition and technology fees only) 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 appropriate withdrawal office promptly when withdrawing could result in a larger fee for the semester. Failure to notify the appropriate withdrawal office is considered to be dropping the student. The appropriate withdrawal office is responsible for the drop charge/percentage refund for the semester in question.

WAIVER OF FEES

Graduate assistants, teaching assistants and associates, research assistants, staff and others whose fees are billed, prepaid, waived, or partially waived must 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 their schedule will be canceled. 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 The University of Tennessee employee spouse/dependent discounts.

GRADUATE STUDENT EMPLOYEE INSURANCE

Effective Fall Semester 2003, all Graduate Assistants, Graduate Teaching Assistants or Associates, and/or Graduate Research Assistants who are employed at least 25% FTE will automatically be enrolled in the Graduate Student Employee Insurance Program. These students will have 100% of the premium paid by the university. The health insurance benefit applies to 9-month and 12-month appointments. These students may elect to add spouse or dependent coverage at their own expense. If students already have insurance coverage through another insurance carrier, this policy functions as additional coverage.

The Student Health Clinic will manage the Graduate Student Employee Health Insurance Program.

STUDENT HEALTH INSURANCE

The University makes available, by contract with an insurance company, group health insurance expressly for students who do not have a graduate assistantship. 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 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 use of the VolCard ID. These cards are non-transferable and may not be duplicated. The VolCard must be carried at all times for purposes of identification. Students are responsible for the safekeeping of this card and must immediately report it lost or stolen if the card is not in their possession. Failure to notify the VolCard office will make the student liable for any unauthorized charges to the debit or charge accounts the student may have.

To obtain a new VolCard or replace a lost or stolen card, report to the VolCard Office, Room 472, S. Stadium Hall, between gates 12 and 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.

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 The
University of Tennessee 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, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia.

Students must be fully admitted to the appropriate degree program, and the letter of certification must be received by the University of Tennessee no later than the first day of classes for the effective semester. Residents of member states who seek further information on approved programs should contact the Southern Regional Educational Board, 592 Tenth Street, N.W., Atlanta, GA 30318-5790, (404) 875-9211, FAX (404) 872-1477, http://www.sreb.org; or Norma Harrington, Office of Undergraduate Admissions, (865) 974-7725.

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. Information is available from November through January on the Graduate Studies web site.

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, 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 web site at http://web.utk.edu/~gsa. Applications must be submitted to the Office of the Dean of Students by the following deadlines:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>Summer Term</td>
<td>April 22</td>
</tr>
<tr>
<td>Fall Semester</td>
<td>September 2</td>
</tr>
<tr>
<td>Spring Semester</td>
<td>November 11</td>
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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 federal 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 the parents includes directory information such as is 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. 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 education programs and services or employment opportunities and benefits. This policy extends to both employment by and admission to the University.

The University does not discriminate on the basis of race, sex, or disability in the education programs and activities pursuant to the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990.

Inquiries and charges of violation concerning Title VI, Title IX, Section 504, ADA, the Age Discrimination in Employment Act (ADEA), or any of the other above referenced policies should be directed to the Office Equity and Diversity (OED); 1840 Meilrose Avenue; Knoxville, Tennessee 37996-3560; telephone (865) 974-2498 (TTY available). Requests for accommodation of a disability should be directed to the ADA Coordinator at the Office of Human Resources Management; 600 Henley Street; Knoxville, Tennessee 37996-4125.

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 their campus Student Affairs Office, student health center or counseling center.

ALCOHOL ABUSE HEALTH RISKS

Liver damage—cirrhosis, alcoholic hepatitis
Heart disease—enlarged heart, congestive heart failure
Ulcers and gastritis
Malnutrition
Cancer—of the mouth, esophagus, stomach, liver
Brain damage—memory loss, hallucinations, psychosis

Damage to fetus if pregnant mother drinks
Death—50% of fatal auto accidents involve alcohol; 31% of suicides are alcoholics

Drug Use Health Risks

Overdosing—psychosis, convulsions, coma, death
Long-term use—organ damage, mental illness, malnutrition, death
Casual use—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.

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 assistant- ships may be financed through funds from grants, contracts, state appropriations designated for research, or the University’s internally sponsored programs. Department Heads are responsible for assuring that GRAs receive ample opportunities to make continuing progress toward their degrees.

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

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

Graduate Assistants are appointed to 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.

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TYPES OF ASSISTANTSHIPS

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

Graduate Teaching Assistant

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

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

Graduate Teaching Associate

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

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

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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.

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TENNESSEE CONFERENCE OF GRADUATE SCHOOLS

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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.
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 these appointments above, the normal work time per week will be prorated.

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

   The student's academic home unit is responsible for implementing these policies, regardless of the assignment or responsible account. It is therefore essential that the home unit be notified by any other unit 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 graduate students in his/her program). 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 Office of Graduate Student Services, P105 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 teaching associates, 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 excused from the requirement of taking the SPEAK test.

   Validation of competence in communicating with students in English is required for all who are responsible for working with students. Deans, Department Heads, and Directors are responsible for validating such competence, using the appropriate university form (APR FORM 1-89).

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 scholarly 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 scholarly 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 Graduate Study 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).
GRADUATE ASSISTANTS

In cases where corrective measures must be taken to remediate deficiencies, the graduate assistant should be notified in writing of recommended action to solve the problem(s). Situations leading to dismissal for cause must be described in writing to the assistant being dismissed. This letter should be written by the supervisor assistant 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. 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.

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 on-going 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 June 2002 and 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 web site 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 web site. Career Services also administers a Credentials Service for doctoral candidates. Setting up a credential file is a simple process involving the submission of a resume and academic transcript, along with letters of recommendation. An alumni placement service offers assistance in the job search after graduation. Also, thousands of resumes are referred directly to employers every year to assist students and recent alumni in their job-seeking activity. A web-based resume book is made available to employers.

Career Services registrants have access to video conference interviewing, resume access via the World Wide Web, and other state-of-the-art forms of placement assistance. Visit the web site 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 interna- tional and U.S. students, faculty and staff.

Contacts: International students seeking admission to UT should contact directly the Office of Graduate Admissions, email: gainfo@utk.edu. Contacts for general inquiries to CIE are cie@utk.edu, phone (865) 974-3177, web site: http://www.utinternational.org. The I-House web address is http://web.utk.edu/~ihouse 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 a variety of meal membership options depending on the type of dining desired. Meal memberships are available to all students living on or off campus. Additional information may be obtained from UT Dining Services, 1017 Francis Street #108, Knoxville, TN 37996; (865) 974-4111; or at www.utdining.com.

Early Education Programs

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

Graduate Student Association

The Graduate Student Association is the (official campus-wide) organization that represents graduate and professional students at the University of Tennessee. Each graduate and professional program of study has a representative elected/selected by his or her fellow students in the respective program. The GSA President and Vice President are elected in the annual SGA elections. GSA has representation on various university-wide committees and represents graduate and professional student concerns to the Graduate Council.

For more information on the GSA, call (865) 974-2377, email: gsa@utk.edu, or check the web site at http://web.utk.edu/~gsa.

Hearing and Speech Services

The Hearing and Speech Center, located at the corner of Peyton Manning Pass and Phillip Fulmer Way, offers complete diagnostic and treatment services to all University students with speech and language disorders/ differences and/or hearing disorders. Services are available to any student who has paid the full University Program 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

The University strives to maintain convenient and comfortable residence hall facilities, which are available to all single students at a reasonable cost. Many residence halls provide excellent study facilities, including computer rooms, and are all within easy walking distance of classrooms and other university facilities.

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.

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.

Additional information may be obtained from the Department of University Housing, 405 Student Services Building, The University of Tennessee, Knoxville, Tennessee 37996-0241; (865) 974-2571; http://web.utk.edu/~reshalls8

Minority Student Affairs

The Office of Minority Student Affairs is located in the Black Cultural Center, 1800 Melrose Place. The office serves as a link between the University and its minority student population. It 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 social topics.

Through the office, students learn to share ideas and embrace a sense of community.

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 at least 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. The T-Access, the university’s new transportation system, is available to transport those individuals with mobility limitations, whether permanent or temporary. Most disabilities require documentation within the past three years from an attending physician or psychologist. However, some disabilities may require more updated documentation. Please contact the office if you have any questions.

Telephone: (865) 974-6087; fax: (865) 974-9552; or e-mail: ods@tennessee.edu.


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 Boulevard 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 but at least 3 hours, paying the optional health fee). These outpatient services are available conveniently throughout every term. 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.

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

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.

For additional information, visit the web site at: http://web.utk.edu/~kkgivens/.

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 necessarily limited. To reduce traffic congestion within the campus area, large parking areas are located on the perimeter of the campus. A comprehensive campus transportation system, called “The T,” connects the Agricultural Campus, residence halls and The Hill. This service provides direct access to and from the heart of campus. Transportation service is also available to university apartments.

A parking permit is required for parking on all University lots, streets, parking structures, or leased lots. Persons who operate a motor vehicle in connection with attendance or employment at the University must register that vehicle with the Parking Services Office.

A University Traffic and Parking authority determines the parking policy, traffic regulations, and fees. Complete information is published each year in the “University Traffic and Parking Regulations” and is available at the Parking Services Office, 24 University Center or 2121 Stephenson Drive; at the Parking Information Center at Circle Park.

For additional information, visit the web site at: http://web.utk.edu/~psos/.

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.

Parking Information Center at Circle Park.

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College of Agricultural Sciences and Natural Resources

Dr. Jack Britt, Vice President for the Institute of Agriculture and Acting Dean
Dr. Mary Lewnes Albrecht, Associate Dean for Academic Programs
Dr. Thomas H. Klindt, Associate Dean, Tennessee Agricultural Experiment Station
Dr. C. Roland Mote, Assistant Dean, Tennessee Agricultural Experiment Station
Dr. Robert H. Orr, Coordinator, International Programs in Agriculture and Natural Resources
Ms. Emily Gray, Director of CASNR Student Services

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

The College of Agricultural Sciences and Natural Resources began in 1869 when 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 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, Environmental and Soil Sciences, and Plant Sciences and Landscape Systems. 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, Natural Resources, and Plants, Soils, and Insects is offered in the college.

College of Architecture and Design

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

School
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 six-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.

The University of Tennessee's Master of Architecture program received a full six-year accreditation as a result of its last NAAB accreditation review in 2002. 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 graduate program and college administration are located at 217B Art and Architecture Building.

**College of Arts and Sciences**

Stuart Rigsby, Interim Dean
Don Richard Cox, Associate Dean
Susan Martin, Associate Dean
William M. Dunne, Interim Associate Dean

**Departments**

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

**Schools**  
Art  
Music

**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 to express oneself clearly, an incentive to absorb emerging knowledge, and a competence to confront the uncertainties of human experience. Faculty research and creative activity is the foundation on which education in this College is built. As a result of that endeavor, the lives of students are enriched and the world’s body of knowledge grows.


**GENERAL INFORMATION**

**Foreign Study Courses**

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

**Off-Campus Study**

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

**Independent Study**

Certain educational goals may best be met through independent study by an individual under the direction of a faculty member. Students who wish to do such independent work should obtain the approval of the faculty members and the departments concerned prior to embarking upon their study. Credit per semester will vary from 1-15 hours. The maximum credit which may be applied toward a degree in the college is established in each individual case by the department in which the student is working.
College of Business Administration
Jan R. Williams, Dean
Sarah F. Gardial, Interim Associate Dean, Academic Affairs
William F. Fox, Director, Center for Business and Economic Research
John E. Riblett, Director of Executive Development Programs

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

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

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

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

College of Communication and Information
Faye D. Julian, Interim Dean
C. Edward Caudill, Associate Dean for Graduate Studies

Schools
Advertising and Public Relations
Communication Studies
Information Sciences
Journalism and Electronic Media

Facilities for Research and Service
Advanced Internet Technologies (AIT)
Center for Information Studies (CIS)
Communications Research Center (CRC)

The College of Communication and Information fosters among students and the larger community a sense of the legal and ethical responsibilities of access to information and the exercise of expression in a democratic society. Additionally, the College serves the professional goals of preparing students for careers in business, communication and information professions.

The College includes four schools: School of Advertising/Public Relations, School of Communication Studies, School of Information Sciences, and School of Journalism/ Electronic Media. Graduate concentrations are offered in advertising, electronic media, journalism, speech communication, information sciences, converging media, science communication, and public relations. These concentrations have a core curriculum.

The College of Communication and Information 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 College of Communications merged with the School of Information Sciences in 2002 to create the new College of Communication and Information.

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.

The College of Communication and Information offers the Master of Science for the Schools of Advertising and Public Relations, Journalism and Electronic Media, Information Sciences, and Communication Studies. The School of Information Sciences provides a program of study leading to the Master of Science degree for librarians and information professionals. The Doctor of Philosophy in Communication is offered with concentrations in the areas noted above. In addition, Communication 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 Communication and Information.

The M.S. programs in advertising/public relations, journalism/electronic media, and speech communication are accredited by the Accrediting Council on Education in Journalism and Mass Communication. The M.S. program in information sciences is accredited by the American Library Association and the National Council for Accreditation of Teacher Education. The College is a member of the Association of Schools of Journalism and Mass Communication, Broadcast Education Association, and the American Library Association.

For application forms and other information about the M.S. and Ph.D. programs in Communication and Information, write to Associate Dean for Graduate Studies, College of Communication and Information, 420 Communications Building, The University of Tennessee, Knoxville, Tennessee 37996-0347.
College of Education, Health, and Human Sciences

John W. Koontz, Interim Dean
Lynn C. Cagle, Associate Dean, Professional Licensure and Outreach
Thomas W. George, Associate Dean, Academic Affairs, Personnel, and Student Services
Shirley W. Hastings, Associate Dean, Extension

Facilities for Research and Service
Academic Enrichment Program
Appalachian Collaborative Center for Learning Assessment and Instruction in Mathematics
Appalachian Rural Systemic Initiative Center on Deafness
Center for Literacy Studies
Center for Physical Activity and Health
Child Development Laboratory
Community Health Research Group
Cornerstone
Educational Interpreting Program
Educational Opportunity Center
Family Life Project
Gerber Grant Project
Gradkids
High School Equivalency Program
Institute for Assessment and Evaluation Instructional Services Center
Least Restrictive Environment for Life Project
Math and Science Regional Center
Nutrition Institute
Orientation to Deafness Program
Pre-College Upward Bound Program
Project Impact
Project Wave
Regional Rehabilitation Continuing Education Program
Rehabilitation Counselor Education in Deafness Program
Rehabilitation Counselor Education Program
Small Animal Research Lab
Southeastern Regional Interpreter Training Consortium
Talent Search Program
Technology Enhanced Curriculum Lab
Tennessee Career Information Delivery System
Tennessee’s Early Intervention Systems
THEC Minority Teacher Education Project
Tourism Institute
UT-TIE
Urban Impact Project
Veterans’ Pre-College Program

The College of Education, Health, and Human Sciences was created in 2002 through a merger of the former College of Education and the former College of Human Ecology. The merger of these two colleges, both with rich histories and exemplary records of achievement, resulted from a recognition of complementary institutional missions and a belief that the two colleges, as one, would become more effective in dealing with the complex challenges facing families, schools, and communities in the 21st Century. The union of Education and Human Ecology to form the new College of Education, Health, and Human Sciences honors its past independent accomplishments but is now focused on an interdependent future. The new College of Education, Health, and Human Sciences is a people-centered college that is intent on enhancing significant aspects of the human condition and, with its disciplines located at the intersection of many of societies greatest challenges, is positioned to make a significant difference through its programs of study, research, and outreach.

The College of Education, Health, and Human Sciences holds accreditation with the National Council for Accreditation of Teacher Education and the American Association of Family and Consumer Sciences. Among its accredited academic programs are the following: Community Counseling and School Counseling by the Council for Accreditation of Counseling and Related Educational Programs; Education of the Deaf and Hard of Hearing by the Council on Education of the Deaf; Rehabilitation Counseling by the Council on Rehabilitation Education; School Psychology by the American Psychological Association and the National Association of School Psychologists; Sport Management (Graduate Level) by the NASSM/NASPE Sport Management Program Review Council; Dietetics by the American Dietetics Association; Recreation and Tourism Management by the National Recreation and Park Association; American Association for Leisure and Recreation.

GRADUATE PROGRAMS OF STUDY

Graduate study in the College of Education, Health, and Human Sciences prepares students for teaching, research, and public service in schools, colleges, universities, and agencies or managerial positions in government, business, and industry. The College offers programs leading to completion of the Master of Science degree, Educational Specialist degree, Doctor of Education degree, and Doctor of Philosophy degree. Additionally, the College makes available Graduate Certificate of Credit Program and various minors.

The following is an overview of those programs; further details on each program are available in the Fields of Instruction (i.e., academic departments) section of this catalog:

Graduate Certificate of Credit Programs
Three certificate programs are available in the College. The Certificate in Urban Education is available through the Department of Theory and Practice in Teacher Education and the Department of Consumer Sciences offers a Certificate in Services Management and a Certificate in Tourism Development.

Minors
Minors are available in Gerontology through the Department of Health and Exercise Science and in Nutrition through the Department of Nutrition.

Master Of Science (M.S.) Degree Programs
M.S. degree programs with majors and concentrations (in parentheses) are available in the following:
Child and Family Studies (Child and Family Studies; Early Childhood Education)
College Student Personnel
Consumer Services Management (Hospitality and Tourism Management; Retail and Consumer Sciences)
Counseling (Mental Health Counseling; Rehabilitation Counseling; School Counseling)
Educational Administration (Leadership 21)
Educational Psychology (Adult Education; Applied Educational Psychology)
Exercise Science
Health Promotion and Health Education Instructional Technology and Educational Studies (Cultural Studies of Educational Foundations; Curriculum; Instructional Technology)
Nutrition (Nutrition Science; Public Health Nutrition)
Recreation and Leisure Studies (Recreation Administration; Therapeutic Recreation)
Safety (Emergency Management; Safety Management)
Sport Studies (Sport Management; Sport Studies)
Teacher Education (Art Education; Early Childhood Special Education; Education of the Deaf and Hard of Hearing; Elementary Education; Elementary Teaching; English Education; Foreign Language/ESL Education; Mathematics Education; Modified and Comprehensive Special Education; Reading Education; Science Education; Secondary Teaching; Social Science Education)

Further information on the above program of study is available in the Fields of Instruction section of this catalog, under the specific academic department.

Master Of Public Health (M.P.H.) Degree Program
The M.P.H. is offered through the Department of Health and Exercise Science (see Health and Exercise Science in the Fields of Instruction section of this catalog).

Educational Specialist (Ed.S.) Degree Programs
The Ed.S. degree is available with majors and concentrations (see parentheses) in the following:
Educational Administration (Educational Administration and Supervision)
Instructional Technology and Educational Studies (Curriculum; Instructional Technology)
School Counseling
School Psychology
Teacher Education (Elementary Education; English Education; Foreign Language/ESL Education; Mathematics Education; Reading Education; Science
Education; Social Science Education; Special Education)
Further information on the above programs of study is available in the Fields of Instruction section of this catalog, under the specific academic department.

Doctor Of Education (Ed.D.) Degree Programs
The Ed.D. degree is offered with majors and concentrations (see parentheses) in the following:
- Educational Administration and Policy
- Educational Psychology and Counseling
- Instructional Technology and Educational Studies (Curriculum, Educational Research, and Evaluation; Instructional Technology)
- Teacher Education (Literacy, Language, and ESL Education; Teacher Education)
Further information regarding above programs of study is available in the Fields of Instruction (i.e., department listings) section of this catalog.

Doctor Of Philosophy (Ph.D.) Degree Programs
The Ph.D. is offered with a major in Education or Human Ecology.
The following concentrations are available in the Ph.D. in Education:
- Counselor Education
- Cultural Studies of Educational Foundations
- Curriculum, Educational Research, and Evaluation
- Early Childhood Education
- Educational Administration and Policy Studies
- Educational Psychology
- Exercise Science
- Instructional Technology
- Literacy, Language, and ESL Education
- School Psychology
- Sport Studies
- Teacher Education
The following concentrations are offered through the Ph.D. in Human Ecology:
- Child and Family Studies
- Community Health
- Hospitality and Tourism Management
- Nutrition Science
- Retail and Consumer Sciences
Further information on the above programs of study is available in the Fields of Instruction section of this catalog, under Education or Human Ecology and under the specific academic department.

Teacher Education
Post baccalaureate students who desire to become teachers (i.e., Pre-Kindergarten-Grade 12) must make application to the College of Education, Health, and Human Sciences’ Teacher Education Program and complete the equivalent of an undergraduate minor in Education before enrolling in required graduate courses. Information on admission to Teacher Education and prerequisite undergraduate courses is available through the Undergraduate Catalog, the College’s Student Services Center (Claxton Complex A332) or at http://cehs.utk.edu/main.html.

Title II, HEA Compliance Report
Per requirements of Title II of the Higher Education Act, the College of Education, Health, and Human Sciences reports the following pass rates on State required licensure tests for the 2001-2002 Academic Year: UT 95%; State of Tennessee 92%.

College of Engineering
Fred D. Tompkins, Interim Dean
Luther R. Wilhelm, Interim Associate Dean, Academic Affairs

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 web site 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, Tennessee 37388.

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.
The principal objective of the college is to prepare students for the practice of law. The college teaches: the analytical skills needed to interpret cases and statutes, the ability to communicate effectively, 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 change 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.
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 broad cadre of students, not of a narrow technician, but of a student of the law with the perspective, breadth, and understanding necessary to accomplish the many tasks assigned by society to the legal profession.

GRADUATE PROGRAM
Two dual degree programs are available in conjunction with the College of Law: the J.D.-MBA program with the College of Busi-ness Administration and the J.D.-M.P.A. pro-gram with the Department of Political Sci-ence. 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
Johnie Mozingo, Interim Associate Dean for Academic Affairs and Chair of Undergraduate Program
Maureen Groer, Associate Dean for Research and Evaluation
Sandra McGuire, Chair of Master's Program
Sandra P. Thomas, Chair of Doctoral 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 Boulevard, Knoxville, Tennessee 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 unconditionally approved by the Tennessee Board of Nursing. Students admitted to the program select a concentration in adult health nursing, family nurse practitioner, mental health nursing, 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.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, Tennessee 37996-3333, or at http://www.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, Academic Programs
Robert N. Moore, Associate Dean, Research and Graduate Programs
Leon N.D. Potgieter, Associate Dean, Hospital Operations

Departments
Comparative Medicine
Large Animal Clinical Sciences
Microbiology-Veterinary Medicine
Pathobiology
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. With the events of September 11, 2001, veterinarians are making significant contributions to biosecurity and homeland defense.

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.
Fields of Instruction

Accounting and Business Law
(College of Business Administration)

MAJORS DEGREES
Accounting ................................................. M.Acc.
Business Administration ................................. Ph.D.

Keith G. Stanga, Head

Professors:
Anderson, Kenneth E. (Distinguished Professor of Taxation), CPA, Ph.D. ........................... Indiana
Fisher, Bruce D., LL.M. ... George Washington
Kiger, Jack E. (Warren L. Slagle Professor of Accounting), CPA, Ph.D. ............... Missouri
Reeve, James M. (Deloitte and Touche Professor), CPA, Ph.D. ... Oklahoma State
Roth, Harold P., CPA, Ph.D. ....................... VPI
Stanga, Keith G. (Andersen Professor), CPA, Ph.D. ..................... Louisiana State
Williams, Jan R. (Ernst and Young Professor), CPA, Ph.D. .............. Arkansas

Associate Professors:
Behn, Bruce K., CPA, Ph.D. ....... Arizona State
Carcello, Joseph V., CPA, Ph.D. ...................... Georgia State
Murphy, Daniel, CPA, Ph.D. .... North Carolina
Townsend, Richard L., CPA, Ph.D. ...... Texas
Woodroof, Jonathan B., CPA, Ph.D. ...................... Texas Tech

Assistant Professors:
DeVries, Delwyn D., CPA, Ph.D. ...................... Arizona State
Pennington, Robin R., CPA, Ph.D. ...................... South Carolina

THE MASTER OF ACCOUNTANCY PROGRAM

The objective of the MAcc program is to prepare individuals who have a high level of ability and motivation for successful careers in professional accounting and industry. This nationally recognized program uses active learning methods to engage students in global business planning, practices, and strategies. The program offers students the breadth of a broad business perspective and exposure to cutting-edge management issues. It also provides students with the technical depth required for a career in assurance services, information management, or taxation. Coursework includes a particular focus on the development of analytical skills, communication skills (both oral and written), and research skills.

The MAcc 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 AACSB International and are among the first programs in the nation to receive this accreditation.

Application Deadline
Students may begin graduate coursework for the MAcc degree only in Fall Semester. The application deadline is March 1 and applications received after that date will be considered as space allows.

Admission Requirements
The program is designed both for students who have completed an accredited baccalaureate degree program with a major in Accounting and others. Students with an accounting degree from an accredited baccalaureate degree program normally meet all prerequisites for the program. Students with outstanding undergraduate records in areas other than accounting may enter the MAcc program (which starts in the fall semester) by completing coursework in introductory accounting and economics, and the following prerequisite undergraduate courses: Accounting 311, 321, 411, 414, and 431, Information Management 341, and Finance 301 or their equivalents as approved by the Director of the MAcc program. In addition, students choosing the Information Management concentration must have completed Information Management 351 or an equivalent course in object oriented-programming. All prerequisites must be completed prior to the start of graduate coursework in fall semester.

In addition to the general admission requirements, MAcc 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 MAcc 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.

Students will be expected to have a laptop computer for use in the classroom and for assignments. Additional details concerning the hardware and software configurations required are posted on the departmental web site.

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 (12 hours) Business Administration 521, 522, 523, 524
Accounting Concentration (18 hours)
Three concentrations are available:
- **Assurance Services**:
  - Acc 507, 514, 518, 519, 531, and IM 541.
- **Information Management**:
  - IM 442*, 541, 549, Acc 514, and two of the following:
    - Statistics 583, Acc 507, Acc 518, Acc 519, Acc 521, or Acc 531.
- **Taxation**:
  - Acc 531, 532, 533, 534, 539, and an additional course.

*Students who have taken this course as an undergraduate must substitute a course approved by the Director of the MAcc program for this course.

Students may further modify their programs with approval of the Director of the MAcc 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:
- Accounting 519 Seminar in Business Risk and Assurance: Accounting
- Accounting 539 Multi-Jurisdictional Tax Planning and Policy, and
- Information Management 549 Systems Analysis and Design.

**BUSINESS ADMINISTRATION CONCENTRATION**

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

**Ph.D. Concentration:** Accounting. This degree provides a research-oriented terminal qualification for those seeking entry-level faculty positions in accounting. Students take approximately three years of coursework beyond the bachelor’s degree, including a doctoral sequence designed to expose students to various areas of accounting research. Courses in accounting and other areas are selected to supplement the student’s individual background and to prepare the student in an area of accounting specialization (financial, managerial, auditing, tax or systems). The final year is normally spent completing the doctoral dissertation. Minimum course requirements are 12 hours including 611, 612, 619, and one other accounting course to be approved by Ph.D. accounting program advisor.

**ACADEMIC STANDARDS**

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

**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 principles and reporting models of non-profit organizations. Integration of economic and social approaches to evaluate an entity's efficiency and effectiveness in variety of 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/N/C only.

507 Financial Reporting Research and Contemporary Issues (3)
- Theory and practice of contemporary financial reporting issues are covered with an emphasis on researching the authoritative accounting literature. Specific contemporary issues covered vary each semester. Prerequisite: Admission to MAcc program or consent of instructor.

514 Information Systems Control and Audit (3)
- Security-, integrity-, and cost management-oriented research tools used extensively. Prerequisite: Admission to MAcc program or consent of instructor.

518 Professional Standards (3)
- Basic standards and contemporary issues relevant to assurance providers. Actual practice cases are used to illustrate application. Prerequisite: Admission to MAcc program or consent of instructor.

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

521 Advanced Management Accounting (3)
- Analysis of management accounting and cost management practices and models. Topics include cost behavior, strategies and models for decision making, and performance measurement issues. Prerequisite: Management Accounting, and either admission to a graduate business program or consent of instructor.

531 Tax Strategy, Tax Research, and Entity Taxation (3)
- Current issues in tax strategy including investment models, implicit taxes, tax arbitrage, organizational form, and other selected topics. Methods of researching tax issues within the U.S. federal tax system with emphasis on Web-based research tools. Income taxation of business entity operations. Prerequisite: Admission to MAcc program or consent of instructor.

532 Corporate Taxation and Reorganizations (3)
- Current issues in corporate taxation including organization and capital structure, distributions, liquidations, acquisitions, and reorganizations. Course emphasizes group projects and presentations. Web-based research tools used extensively. Prerequisite: Admission to MAcc program or consent of instructor. Prerequisite or corequisite: 531.

533 Taxation of Partnerships and S Corporations (3)
- Current issues in partnership and S corporation taxation including partnership formation, operations, allocations, and distributions; LLCs; S corporation election and operations; and comparisons of different flow-through entities. Course emphasizes group projects and presentations. Web-based research tools used extensively. Prerequisite: Admission to MAcc program or consent of instructor. Prerequisite or corequisite: 531.

534 Family Tax Planning (3)
- Methods used to value closely-held business, the law and planning strategies related to inter vivos and post-mortem property transfers and the taxation of estates, and financial planning techniques used to meet family tax planning objectives. Prerequisite: Admission to MAcc program or consent of instructor. Prerequisite or corequisite: 531.

539 Multi-Jurisdictional Tax Planning and Policy (4)
- Internal and state tax law as it pertains to business transactions. Particular emphasis is placed on identifying tax planning opportunities and designing tax strategies to meet planning objectives. Prerequisite: 531 and either admission to MAcc program or consent of instructor.

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

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

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

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

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

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

693 Independent Study (3)
- Directed research in topic of mutual interest. Prerequisite: 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. Prerequisite: Legal Environment of Business and admission to M.Acc. program or consent of instructor. Not available for students with credit for 401.

**Advertising and Public Relations**

(College of Communication and Information)

**MAJOR DEGREES**

Communication ......................... M.S., Ph.D.

Ronald E. Taylor, Director

Professors:
- Hovland, Roxanne, Ph.D. ............... Illinois
- Hoy, Maria, Ph.D. ......................... Oklahoma State
- Taylor, Ronald E., Ph.D. ............... Illinois

Associate Professors:
- Haley, Eric, Ph.D. ......................... Georgia
- Morrison, Margaret, Ph.D. ............. Georgia
- Morrow, Jerry L., Ph.D. ................. Toledo
- White, Candace L., Ph.D. ............... Georgia

- White, Candace L., Ph.D. ............... Georgia
Assistant Professors:
Fall, Lisa T., Ph.D. ................. Michigan State
Hoegels, Michael, Ph.D. .............. Florida
McMillan, Sally, Ph.D. ................. Oregon
Riechert, Bonnie P., Ph.D. .......... Tennessee

The School of Advertising and Public Relations offers a concentration area for the master's degree with a major in Communication and participates in the interdisciplinary doctoral program. See Communication and for additional information.

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

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.

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.

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.

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.

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

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 presentation of public 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.

516 Seminar in Public Relations Issues (3) Topics vary. May be repeated. Maximum of 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.

560 Publishing on World Wide Web (3) (Same as Journalism 560.)

571 Public Relations Management (3) Analysis and management of problems in communication between institutions and organizations and their publics. Measurement and evaluation of effectiveness of communication 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.

Aerospace Engineering
See Mechanical, Aerospace, and Biomedical Engineering

Agricultural and Extension Education
(College of Agricultural Sciences and Natural Resources)
MAJOR
Agricultural and extension education ...... M.S.

Professors:
Waters, Randol G. (Liaison), Ph.D. ........................................ Penn State
Eneriti Faculty:
Lessly, Roy R., Ed.D. .......... Oklahoma State
Todd, John D., Ed.D. ........................................ Illinois

The Department of Agricultural and Extension Education offers a program leading to the Master of Science degree with a major in Agricultural and Extension Education. The program is designed primarily for teachers of Agricultural Education and staff employed by the Agricultural Extension Service. However, due to the flexibility of the program, it would be of value to any student interested in agriculture or 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 towards this requirement.
2. A minimum of 20 hours of graduate credit in courses numbered at or above the 500 level.
3. A minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department.
4. A minimum of 3 hours of graduate credit in coursework in either research methodology or statistics.

5. A final oral examination.

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

5. A creative component designed by the student and approved by the student's advisory committee for 3 hours of graduate credit.
6. A written and oral comprehensive examination.

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

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.

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.

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

521 Extension Program Planning and Evaluation (3) Theories and models of program development and evaluation and their use in extension education: planning and conducting needs assessments; planning, organizing, implementing and evaluating extension educational program content and learning activities; 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.

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: 436, 436 Student Teaching in Agricultural and Extension Education or consent of instructor.

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.
GRADUATE COURSES

Agricultural Economics

MAJOR DEGREES

Agricultural Economics ............................. M.S.
D. L. McLemore, Head

Professors:
Brooker, J. R. (Laison), Ph.D. ............ Florida
Cross, T. L., Ph.D. ....................... Oregon State
Eastwood, D. B., Ph.D. ...................... Tufts

English, B. C., Ph.D. .................. Iowa State
Garland, C. D., Ph.D. ................. Tennessee
Gerloff, D. G., Ph.D. ............... Texas A&M
Hall, Charles R., Ph.D. .......... Mississippi State
Jensen, K. L., Ph.D. ...................... Oklahoma State
Klintd, T. H., Ph.D. .................... Kentucky
McLemore, D. L., Ph.D. ............. Clemson
Orr, R. H., Ph.D. ....... Illinois
Park, W. M., Ph.D. ............... Virginia Tech
Ravis, 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

Associate Professors:
De La Torre Ugarte, D. G., Ph.D. .......... Oklahoma State

Assistant Professors:
Bazen, Ernest F., Ph.D. ............ Kentucky
Clark, Christopher D., Ph.D. .......... Vanderbilt
Tiller, K. H., Ph.D. .................... Tennessee

Emeriti Faculty:
Badenhop, M. B., Ph.D. ............... Purdue
Cleland, C. L., Ph.D. ............... Wisconsin
Keller, L. H., Ph.D. ............... Kentucky
Leuthold, F. O., Ph.D. .......... Wisconsin
McManus, B. R., Ph.D. ............ Purdue
Martin, J. A., Ph.D. ............... Minnesota
Mundy, S. D., Ph.D. .............. Tennessee
Pentecost, B. H. J. D. .......... Minnesota
Whatley, T. J., Ph.D. ............... Purdue

The Department of Agricultural Economics offers a program of graduate study leading to the M.S. degree. The M.S. program may be completed under a thesis option with a concentration in agricultural economics. A non-thesis option is available with concentrations in agricultural economics or agribusiness. For specific information, contact the department head.

THE MASTER'S PROGRAM

A candidate for the master's degree must complete a minimum of 30 hours of graduate credit in courses approved by the student's master's committee. At least 27 hours of graduate credit must be earned in courses numbered at or above the 500 level.

Agricultural Economics

The thesis option in agricultural economics is designed to prepare students for analytical and research careers in the public and private sectors, and to prepare students interested in entering a Ph.D. program. In the thesis option, 15 hours of agricultural economics, 6 hours of economic theory, 6 hours of quantitative methods, and 6 hours of thesis are required. Each student must pass a final oral examination.

In the non-thesis option, 24 hours in agricultural economics, 6 hours of economic theory, and 6 hours of quantitative methods are required. Each student must pass both written and oral comprehensive exams.

Agribusiness

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

MINOR

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

MINOR IN ENVIRONMENTAL POLICY

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

Agricultural Economics

GRADUATE COURSES

412 Agricultural Finance (3) Macro-finance, financial objectives, acquisition of debt and equity funds, capital investments, capital allocation, credit analysis, borrower and lender loan application analysis, insurance strategies, computer applications, kinds and sources of agricultural credit, and financial intermediation. Prereq: 212 The Agribusiness Firm and Economics 201 Introductory Economics.

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

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.

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 break-even analysis; evaluating profitability, liquidity, and solvency using financial statements; analyzing investments using capital investment analysis. Prereq: Farm Business Management or consent of instructor.

450 Agricultural Industry Analysis and Forecasting (3) Analytical tools for decision making in agricultural sectors; 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.

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 or improving environmental quality. Prereq: Introductory Economics.
Agriculture and Natural Resources

(College of Agricultural Sciences and Natural Resources)

GRADUATE COURSES

491 International Experience in Agriculture and Natural Resources (1-15) Credit for formalized international experiences related to agricultural sciences and natural resources. Determination of credit based on nature of the proposed experience. Student should discuss the opportunity with their faculty advisor prior to the trip to determine if it is appropriate for credit. Credit hours will be determined by the department and college depending on the extent of activity and types of projects and/or presentations to be completed by the student upon return. Letter grade or S/NC.

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, Environmental and Soil Sciences 507, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.) S/NC only.

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.

Alan Mathew, Head

Professors:

Conatser, G. E., M.S. ................. Kentucky
Gill, W. W., Ph.D. .................... Kentucky
Goan, H. C., Ph.D. ................... Michigan State
Godkin, J. D., Ph.D. ................ Massachusetts
Kattesh, H. G., Ph.D. .............. VPI
Kirkpatrick, F. D., Ph.D. ............ Tennessee
Lane, C. D., Ph.D. .................. Tennessee
Meadows, D. G., Ph.D. ............. Texas A&M
Neel, James B., Ph.D. .............. Tennessee
Oliver, S. P., Ph.D. ................. Ohio State
Robbins, K. R. (Laison), Ph.D. .... Illinois
Rogers, Gary W., Ph.D. .......... NC State
Saxton, A., Ph.D. .................. NC State

Associate Professors:

Grizzle, J. M., Ph.D. ................. Florida
Harper, F., Ph.D. ................... Rutgers
Heitmann, R. N., Ph.D. ............ Maine
Mathew, A. G., Ph.D. ............. Purdue
Schrick, F. N., Ph.D. .............. Clemson
Smith, M. O., Ph.D. .............. Oklahoma State
Staiger, Kenneth J., Ph.D. ........ Iowa State
Waller, 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 toward livestock, 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 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 site 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 problem and conducts the final oral examination which consists of a comprehensive oral examination and a defense of the thesis.

THE DOCTORAL PROGRAM

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

1. A minimum of 16 hours in related fields outside of animal science.
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.

A minimum of 1 hour of Agriculture 512 in addition to that required at the 400 level.

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 chairperson of which at least one must be outside Animal Science. 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 program and determines if there is to be a foreign language requirement. The advisory committee conducts the comprehensive written and oral examination and the final dissertation defense examination.

GRADUATE COURSES

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

430 Nutrient Evaluation and Ration Formulation (3) Nutrient analysis and formulation for beef and dairy cattle, horses, swine, poultry, laboratory, zoo, and companion animals. Mathematical and computer solutions and applications to formulating complex rations with constraints. Prereq: 390 Comparative Animal Nutrition or equivalent and introductory computer science course. 2 hrs and 1 lab.

481 Beef Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and management of beef and dairy cattle; enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production response and economic returns. Comparisons made to small ruminant, forage-based production systems. Prereq: Completion of Animal Science sophomore and junior core courses or consent of instructor. 2 hrs and 1 lab.

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

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

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

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

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 for faculty time before degree is completed. May be repeated. S/NC only.

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

511 Special Problems in Animal Science (1-4) Prereq: Consent of instructor and department head. May be repeated. Maximum 9 hrs.


530 Animal Nutrition and Metabolism (4) Comparative digestive physiology, digestion, absorption and metabolism of nutrients in ruminant and nonruminant species. Concepts and methodologies for management of growth and nutrient requirements; interrelationships; availability and deficiencies of nutrients, Prereq: Animal Nutrition, Feeds, and Ration Formulation or consent of instructor.

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

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.)

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

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 Sciences and Landscape Sciences 471 or equivalent; knowledge of software package on micro- or mainframe computer. (Same as Plant Sciences and Landscape Sciences 571.)

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.

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

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

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

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

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

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.)

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.

Animal Science—Veterinary Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine.

Anthropology

(Admission of Arts and Sciences)

MAJOR DEGREES

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

Andrew Kramer, Head

Professors:

Faulkner, Charles H., Ph.D. ............... Indiana
Harrison, Faye V., Ph.D. ................. Stanford
Howell, Benita J., Ph.D. ............... Kentucky
Jantz, Richard L., Ph.D. ............... Kansas
Klippel, Walter E., Ph.D. ............... Missouri
Konigsberg, Lyle, Ph.D. ............... Northwestern
Logan, Michael H., Ph.D. .............. Penn State
Schoedel, Gerald F., Ph.D. ............ Washington State
Simek, Jan F., Ph.D. ......... SUNY Binghamton

Associate Professors:

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

Assistant Professor:

Qirko, Hector N., Ph.D. ............... Tennessee

Instructor:

Jantz, Lee Meadows, Ph.D. .......... Tennessee

Research Director:

Driskell, Boyce, Ph.D. .............. Kentucky

Research Associate Professor:

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

Research Assistant Professors:

Elam, J. Michael, Ph.D. ............. Missouri
Frankenberg, S., (Curator), Ph.D. .......... Northwestern
Sherwood, Sarah C., Ph.D. ......... Tennessee
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 Department of Anthropology, SSH 250, University of Tennessee, Knoxville, Tennessee 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 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 besides the student’s primary concentration. At least 20 hours of coursework must be at the 500 level or higher.

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

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

5. A graduate-level introductory statistics course, usually Statistics 537.

6. In the second year of the program, students must complete an additional course sequence and undertake thesis research. Coursework will be determined through consultation with the student’s advisor and committee (composed of the advisor and at least one other member of the Anthropology faculty along with other mutually-agreed upon members).

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

8. Two copies of the thesis are required by the 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 conditional approval. Students holding master’s degrees from other institutions must apply by January 15 for admission 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, 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 directly consult 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 Evaluation Examinations.

**Doctoral Committee:** A doctoral committee is appointed following admission to the program. In consultation with this committee, the student defines the future program of study. When the student and committee agree upon 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 the fall semester following 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 language should normally be French, German, Russian or Spanish, but another language may be substituted at the committee’s discretion. This requirement may be met by either:

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

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

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

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

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 ethnographies. 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 archaeological, ethnohistoric, and contemporary cases. 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. Role of symbols, rituals, and ideologies in producing and reproducing power relations. Relations among individuals and structures. Recapitulation 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 cultural anthropologists use 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. Artifactual material from historic East Tennessee sites used for class projects. Recommended prereq: Historic Archaeology.

440 Cultural Ecology (3) Concepts and methods in studying dynamic interaction between prehistoric and present day cultures and their environments: ecological theory, methods of analysis, and review of selected case studies. Prereq: 120, 130, 410, or consent of instructor.

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

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

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

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

470 Human Osteology (4) Intensive examination of human skeleton. Prereq: 110 or consent of instructor. 3 hrs and 1 lab.

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

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

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


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

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

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 those students 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 Method and Theory in Cultural Anthropology (3) Development of primary theoretical orientations by cultural anthropologists; formulation of research problems; and handling research issues. Techniques of writing, editing, 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 researching 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 patternizing, theories of disease causation, and models of therapy. Theoretical and applied aspects of the anthropological study of health and disease. Prereq: Consent of instructor.

517 Forms of Social Inequality (3) Anthropological perspectives on societies stratified along lines of rank, caste, race, ethnicity, and class; inequalities engen- dered by role structure in social institutions; distinc- tions before and after rise and consolidation of modern world system. Intersections of race and ethnicity with class and gender.

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 archaeo- logical contexts. Basic osteology and shell characters of species encountered in archaeological sites; use of comparative collections. May be repeated. Maximum 8 hrs.

522 Seminar in Anthropology (3) Theoretical and practical issues in contemporary archaeology: ethnoarchaeology, 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, processing, and analysis of archaeological data. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

550 Contemporary Issues in Anthropology (1-3) Review of current topics and issues in anthropology. May be repeated. Maximum 6 hours.

560 Theory in Archaeology (3) Detailed consideration of theory in contemporary archaeology: models of scientific explanation, representation, archaeological formation processes, and methods of analysis and interpretation.

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

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

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

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


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

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

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

(College of Architecture and Design)

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

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

Professors:
Kelso, R. M., M.S. .............................. Tennessee
Kinzy, S. A., Ph.D. .............................. SUNY (Buffalo)
Lizon, P., Ph.D. ................................. Pennsylvania
Moffett, M. S., Ph.D. ........................... MIT
Rabun, J., M.A. .................................. Texas
Robinson, M. A., M.Arch. ................ Pennsylvania
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
Debellius, C., M.Arch. ....................... Harvard
Drisin, A., MdesS. .............................. Harvard
Fox, L. D., M.Arch. ............................. Cranbrook
Jacob, J. D. ....................................... New York
Martella, W. E., B.Arch. ...................... California
Moir-McClean, T. W., M.Arch. .......... Michigan
Schimmenti, M. M., M.Arch. ............... Florida

Assistant Professors:
Altwicker, M., B.Arch. ....................... RPI
DeKay, M., M.Arch. ............................ Oregon
Dodzi, G., Ph.D. ............................... Pennsylvania
French, R. C., B.Arch. ........................ Tennessee
Klinkhammer, B., M.Arch. ................. RWTH (Aachen)

Stach, E., IPMA ............................... Bauhaus
Thurlow, A., M.Arch. ......................... Columbia
Ware, S. M., M.F.A. ........................... Tennessee

Emeriti Faculty:
Conley, G., B.Arch. ............................ Harvard
Kaplan, M., M.Arch. ............................ Harvard
Lauer, W. J., M.S.Arch. ........................ Iowa State
Lester, A. J., M.Arch. ............................ Virginia
Rudd, J. W., M.A. ............................... Northwestern

Masters 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 non-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 3½ 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.

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 through the ages. Open to all students.

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

412 Non-Western and 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 buildings 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 the beginning of Renaissance.

417 The International Style (3) Survey of architecture of early modern movement, primarily in Europe and America, 1900-1940.


420 American Architecture, 1860-1940 (3) Stylized periods from Gothic Revival through twentieth century.

421 History of Landscape Architecture (3) Intellec- tual, societal, and geographical influences that provide theoretical basis for design throughout his- tory. Selected examples of landscape architecture analyzed in terms of design.

422 Modern East European Architecture (3) Twen- tieth century architecture in Russia, Czechoslovakia, Poland, Hungary, East Germany, Romania, Bulgaria, Yugoslavia

425 Special Topics in Architecture (1-6) Faculty initiated courses. Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

432 Computer Applications in Design II (3) Advanced computer aided design using three-dimen- sional modeling software. Design analysis using com- puter animation, rendering techniques, visualization, and video. Prereq: Computer Applications in Design I or consent of instructor.
ART

(Art (College of Arts and Sciences)

MAJOR DEGREE

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

Paul Lee, Director

Professors:
Blain, Sandra J., M.F.A. .............. Wisconsin
Brakke, P. M., M.F.A. .................. Yale
Goldenstein, M. B., M.F.A. ........... Nebraska
Habel, Dorothy, Ph.D. ............... Michigan
Kennedy, William C., M.F.A. ........ Wisconsin
Lee, B., M.F.A. ............................. Yale
Leland, W. E., M.F.A. ............... Tennessee
Lyons, B. (Liaison), M.F.A. ....... Arizona State
Magden, Norman, Ph.D. .......... Case Western Reserve
Moffatt, F., Ph.D. ................. Chicago
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:
Brokken, P. M. .............. Rhode Island School of Design
Dewey, William, Ph.D. ............. Indiana
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
Schmerler, Deborah, M.F.A. ..... Virginia Commonwealth
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, and sculpture.

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 assistantship, 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.
4. A portfolio to be evaluated by the faculty.

Further information is available by writing to the School of Art.

M.F.A. Requirements

A minimum of 60 hours is required:
1. Successful completion of 20 hours of studio in a concentration area. An inter-area program must be approved by the graduate faculty only after the second semester in residence. Ten hours of concentration must be in second year courses (512, 514, etc.)
2. A minimum of 9 hours of graduate level academic (non-studio) courses of which at least 6 hours are to be in art history.
3. Eleven hours of electives which may consist of any combination of courses offered by the University for graduate credit.
4. Art 599, Project in Lieu of Thesis (20 hours). A third year of semi-independent study. Student must have completed all other coursework prior to registration.

Four semesters (normally the first 40 hours) beyond the bachelor’s degree are required in residence. An exception is made for working professional designers who may complete their first 20 hours, with the permission of the faculty, on a part-time basis. Residence is defined by the School of Art.
Art as (1) a minimum enrollment of 6 hours per semester and (2) use of School of Art facilities so that students are available for discussion and criticism.

The candidate’s committee will consist of a minimum of 3 members and a maximum of 6 members and will be appointed prior to registration for 589. The committee must consist of one faculty member from the candidate’s concentration area (designated as chairperson) and a faculty member from outside the concentration area. The inclusion of an Art History faculty member on each committee is encouraged.

Exhibition and oral examination: With the completion of all requirements for the M.F.A., the student must produce an exhibition and, in the presence of that work, must satisfactorily complete an oral examination.

Academic Standards
1. First-year evaluation: At the end of the first 2 semesters in residence, the student must present a portfolio for evaluation by the faculty and receive permission to continue in the program.
2. Second-year evaluation: With completion of all coursework, the student must present work for evaluation by the faculty and receive permission to register for Projects in Lieu of Thesis.

3. If, in a review by the student’s major area faculty, the student’s progress is deemed insufficient, the faculty may recommend a work period without advancement toward the degree, probation with specific goals set for a specific time, or dismissal.

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, and applied science. (Same as Anthropology 481.)
482 Museology II: Exhibition Planning and Installation (3) Planning, development, and implementation. Exhibition design and installation techniques. Publicity, production, matting and framing, shipping and storage. Prereq: 481 or consent of instructor. (Same as Anthropology 482.)
484 Museology III: Field Projects (1-12) Special field projects: restoration, preservation, registration, and other related research on off campus. Prereq: 481 and 482 or consent of instructor. (Same as Anthropology 484.)
499 Special Topics (3) Student- or instructor-initiated course offered at convenience of department. May be repeated. Maximum 12 hrs.
502 Registration for Use of Facilities (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.
507 Professional Practices: Teaching Internship (1) Individual study in development of skills and methodology in teaching studio courses. For students who are not GTAs. Prereq: Consent of instructor. May not be used toward degree requirements. May be repeated. S/NC only.
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.
595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.

Art Ceramics
GRADUATE COURSES
424 Ceramics: Clays and Glazes (3) Clay chemistry, clay bodies, glaze theory and calculation. Formulating, mixing and testing of clay bodies and glaze formulas. Prereq: Ceramics: Portfolio Review.
429 Ceramics: Special Topics (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
521 Graduate Ceramics I (2-5) May be repeated. Maximum 10 hrs.
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.

Art Design/Graphic
GRADUATE COURSES
405 Computer Enhanced Graphic Design (3) Exploration of new technologies and their significance to graphic design. Prereq: 351 Intermediate Graphic Design I, 356 Graphic Design Production with a grade of C or better and consent of instructor. May be repeated. Maximum 12 hours.
451 Advanced Graphic Design (3) Theory and techniques of visual problem-solving as applied to advanced applications of graphic design. Prereq: Intermediate Graphic Design II with a grade of C or better.
452 Graphic Design Seminar (3) Discussion of design and professional issues: politics, economics, and ethics for graphic designer. Culminates in student-initiated project. Prereq: 451 with a grade of C or better.
453 Advertising Illustration (3) Media and techniques as applied to advertising illustration. Prereq: Black and White Illustration and successful completion of any portfolio review.
454 Editorial Illustration (3) Media and techniques as applied to editorial illustration for books, magazines, and newspapers. Prereq: Black and White Illustration and successful completion of any portfolio review.
456 Graphic Design Practicum (3-12) Practical work experience in graphic design field. Only by permission and arrangement with department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
459 Special Topics in Graphic Design (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.
550 Studies in Graphic Design/Illustration History (3) Design and illustration ca. 1850 to present. Prereq: M.F.A. candidate or consent of department. May be repeated. Maximum 6 hrs.
551 Graphic Design I (2-6) May be repeated. Maximum 10 hrs.
552 Graphic Design II (2-6) May be repeated. Maximum 10 hrs.
553 Computer Enhanced Design (2-6) Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of instructor.
595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only.

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.

Art History
GRADUATE COURSES
403 History of Photography (3) Survey of history of photography from introduction of daguerreotype and calotype to more recent trends. Aesthetics and use of photography as medium for artistic expression.
411 Art of South and Southeast Asia (3) Survey of art and architecture of Indian subcontinent and South- east Asia from 200 B.C. to 20th century. Major achievements of each period in religious, political, and social contexts.
Art

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.

416 Chinese Art of the 20th and 21st Centuries (3) Survey of Chinese art. Some ancient Stone and Iron Age periods through the present. Hong Kong, Taiwanese, and expatriate artists are also considered.

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, 800-1400 (3) Western European art of the "Dark Ages," Romanesque, and Gothic periods. Writing-emphasis course. (Same as Judaic Studies 431.)

441 Northern European Painting, 1350-1600 (3) 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) Concentrated study of Bruegel, Rubens, Rembrandt, Georges de la Tour, Vermeer, Poussin, and Hals. Writing-emphasis course.


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

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 the area from 19th century to present. (Same as African and African American Studies 461.)

462 Art and Archeology of Ancient Africa (3) Historical art traditions of sub-Saharan Africa. Prehistoric 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. (Same as African and African American Studies 462.)

463 Arts of the African Diaspora (3) Aesthetic, philosophical and religious purposes of African decorative arts in the Caribbean and United States. Full range of art forms: sculptural and performance traditions, architecture, textile, basketry and pottery art forms. (Same as African and African American Studies 463.)

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) Developments in architecture, painting, and design from 1900.

473 19th-Century American Painting (3) From West and Copley to emergence of "The Eight."

474 Theory of 20th-Century Art in Europe and America (3) Theoretical basis for modern movement. Analysis and discussion of individual works of art in light of contemporary writings by artists and theorists. Prereq: Western Art I and II, or consent of instructor.


476 History of 20th-Century Painting and Sculpture in Europe (3) Development of Modern and Post-Modern movements in Europe. Investigation of progression of abstraction through more recent conceptual 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.

489 Studies in Art History (3) Concentration in individually selected area. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

571 Studies in Medieval Art (3) Art and architecture of Middle Ages: master monuments from Byzantine or western Europe. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. 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.


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 department. 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.

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.


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 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 development of concepts and techniques for creation of film as art form; individual projects. Prereq: Introduction to Cinematography as Art and Media Arts Portfolio Review or consent of instructor. May be repeated. Maximum 9 hrs.

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

438 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) Continuation of exploration and implications of use of computer in photography. Prereq: Digital Photography I and consent of instructor.

442 Large Format Photography II (4) Studio course that continues exploration of use of large format camera in photography. Prereq: Large Format Photography I and consent of instructor.

531 Photography I (2-6) May be repeated. Maximum 10 hrs.

532 Photography II (2-6) May be repeated. Maximum 10 hrs.

535 Media Arts I (2-6) May be repeated. Maximum 10 hrs.

536 Media Arts II (2-6) May be repeated. Maximum 10 hrs.

577 Studies in Media as Art (3) Selected topics in theory and history of media as art form. May be repeated. Maximum 5 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.
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 (3-6) 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 matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. May be repeated. Maximum 10 hrs.

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


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. Students work independently while participating in group projects, critique, and discussion. Prereq: 6 hours of 300 level sculpture. May be repeated. Maximum 12.

449 Special Topics in Sculpture (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Successful completion of any 300 level sculpture. May be repeated. Maximum 8 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.

Astronomy

See Physics and Astronomy

Audiology and Speech Pathology

(College of Arts and Sciences)

MAJORS DEGREES

Audiology ................................. Au.D.
Speech and Hearing Science ........ Ph.D.
Speech Pathology ......................... M.A.

Ilsa Schwarz, Head

Professors:
Asp, Carl W., Ph.D. ................. Ohio State
Nabelek, Anna, Ph.D. .............. Poland
Schwarz, Ilsa, Ph.D. ............... Oregon

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
Filsen, Peter, Ph.D. ................. Wisconsin
Harkrider, Ashley, Ph.D. ........ Texas
Horton-Ikard, RaMonda, Ph.D. ....... Wisconsin
Munoz, Maria, Ph.D. .............. Texas

Clinical Director:
Michael, Ann, Ph.D. ................. Vanderbilt

Clinical Faculty:
Barnes, Vickie, M.A. .......... Tennessee
Berliner, 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
Hustell, Gayla, M.A. .......... Tennessee
Jenkins, Kimberly, M.A. ....... Tennessee
Johnston, Kristi, M.A. .......... Tennessee
Lewis, Dee, M.A. ............... Tennessee
Powell, Pam, M.A. .......... Tennessee
Schay, Nancy, M.A. .......... Tennessee
Seafoss, 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
Vaughn, Teresa, M.S. ......... Eastern Kentucky
Ward, Tracey, M.S. ......... East Tennessee State
Webb, Patricia, M.Ed. ............ Florida
Yeager, Kelly, B.S. ......... South Alabama

THE MASTER'S PROGRAM IN SPEECH PATHOLOGY

A major is offered in Speech Pathology. Admission to this graduate program is competitive. This graduate program is 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 each semester (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, 531, 626, or 661 and at least 15 hours of elective courses. Undergraduate coursework may not be substituted for seminar courses. Students who have not completed an undergraduate course in each of the following three areas—articulation/phonological processing disorders, voice disorders, and fluency disorders—must complete one graduate course in each of the three areas.

Students majoring in speech pathology may elect either the thesis or non-thesis option. The master’s program in speech pathology with thesis includes six hours of 500 credit in the preparation of an acceptable thesis representing original independent work, and a final oral examination. Students in the non-thesis option must pass a final written examination.

Graduate students in both Audiology and Speech Pathology may elect to pursue a concentration in the area of aural habilitation.
Admission to the aural habilitation concentration is competitive and applications will be processed during the first year of graduate study. The concentration requires: (1) Three semesters of clinical practicum in treatment of children who have hearing-impairments, totaling a minimum of 130 clock hours, and (2) completion of 6 hours of graduate level courses in language, audiology, and/or aural habilitation. Specific requirements are outlined in the Graduate Handbook for Audiology and Speech-Language Pathology, as well as on the Departmental web site (http://web.uky.edu/~aspweb/).

DOCTORAL PROGRAMS

The Doctor of Audiology (Au.D.) program is designed to prepare individuals for professional careers in audiology. The degree program is clinically oriented, with primary emphasis on processes involved in hearing, vestibular function, and communication. The program is designed to meet the entry-level requirements for the practice of audiology established by the Council on Academic Accreditation of the American Speech-Language-Hearing Association. Students will be expected to demonstrate competencies in the following areas:
1. Prerequisite knowledge and skills for the practice of audiology.
4. Evaluation of auditory, vestibular, and related communication disorders.
5. Treatment of auditory, vestibular, and related communication disorders.

The program will normally consist of four calendar years of study beyond the baccalaureate degree with the first three years being devoted primarily to formal coursework and the last year to a full-time externship in the practice of clinical audiology.

The program is a minimum of 112 semester hours, including a minimum of:
1. 67 semester hours of academic coursework at the 500- and 600-levels.
2. 3 semester hours of directed research in audiology, vestibular, or related communication disorders.
3. 24 semester hours of clinical practice in audiology.
4. 18 semester hours of externship in audiology (6 hours per semester for 3 semesters).
5. A comprehensive examination.

The Ph.D. program in Speech and Hearing Science seeks to develop individuals for professional careers in a variety of positions including research and college teaching in the concentration areas of speech and language pathology, audiology, speech-language science or hearing science. The degree program is research oriented with primary emphasis on processes involved in normal, 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. 2 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 the topic of major interest;
   b. a minimum of 6 semester hours in 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.

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

435 Introduction to Speech Sound Disorders (3) Prereq: 434 or equivalent or consent of instructor.

440 Voice Disorders (3) Etiology, diagnosis, and treatment of articulatory and phonological disorders. Prereq: 300 Introduction to Communication Disorders, 305 Phonetics, or consent of instructor.

455 Problems in Speech Pathology (1-3) Prereq: Consent of instructor.


473 Introduction to Audiologic Assessment (3) Prereq: Consent of instructor.

475 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 and consent of instructor.

494 Aural Habilitation/Rehabilitation of the Hearing Impaired (3) Prerequisites: Co�elopmental characteristics, assistive devices, speech acquisition, speech perception, speech reading, perceptual-rhythm, decreased hearing, and strategies for hearing impaired adults. Prereq: 305 Phonetics and 473 or equivalent, or consent of instructor.

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

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 statistics, application of statistics, and completion of a proposal and hypothetical pilot research project.

512 Clinical Practice in Audiology (1-4) Coreq: 546. May be repeated. Maximum 24 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, therapy, therapy concepts 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 processing disorders. Prereq: 435 or equivalent, or consent of instructor.

523 Seminar in Voice Disorders (3) Current research in diagnosis and management of voice disorders. Multicultural, gender and age-related issues. Prereq: 440 or equivalent, or consent of instructor.

524 Traumatic Brain Injury (3) Advanced neurogenics: cognitive-linguistic emphasis. Medical and speech-language pathology rehabilitation issues associated with traumatic brain injury (TBI) related to adult TBI population. Prereq: 506 and 520, or consent of instructor.

526 Dysphagia (3) Clinical diagnosis, evaluation, and treatment of adult swallowing disorders and critical interpretation of research literature on dysphagia. Prereq: 506 or consent of instructor.

531 Seminar on Stuttering (3) Current significant research in stuttering. Prereq: 431 or consent of instructor.

533-534 Advanced Clinical Practice in Speech-Language Pathology (1-4, 1-4) Prereq: 534 or equivalent, or consent of instructor.

535-36 Advanced Clinical Practice in Speech-Language Pathology: Off-Campus Sites (1-4, 1-4) Prereq: 535. Requires 100 hours clinical experience, consent of instructor. May be repeated. Maximum 6 hrs each. Enrollment for less than 4 semesters must have prior departmental approval.

538 Advanced Clinical Practice in Speech-Language Pathology: Public Schools (1-4) Prereq: 431. May be repeated. Maximum 6 hrs. Enrollment for less than 2 hrs must have prior departmental approval.
539 Motor Speech Disorders (3) Neuromotor organiza-
tion for speech production; types of motor speech
disorders and associated neuromuscular symptomat-
ology; diagnosis and management of motor speech
disorders. Prereq: 506.

540 Structural Speech Disorders (3) Etiology, diag-
nosis and clinical management of craniofacial speech
disorders and laryngeotomy. Prereq: 306 Anatomy and
Physiology of Speech and 435.

541 Pediatric OroMotor Disorders (3) Evaluation,
diagnosis and treatment of pediatric oroMotor dis-
abilities that affect normal acquisition of feeding and
prespeech skills. Prereq: 506 or consent of instructor.

542 Hearing Disorders (3) Effects of heredity,
development/aging, diseases, and physical agents on hear-
ing. 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 analy-
sis of hearing aids. Coupler material and geometry
effects. Practical experience in troubleshooting, re-
pair, and construction of hearing aids. Prereq: 473 and
507 or equivalents or consent of instructor.

544 Amplification for Adults with Hearing Impair-
ment (3) Speech acoustics/psychoaesthetics. Influ-
ence of hearing loss on speech and auditory pathology
on speech perception. Strategies for selecting ampli-
fication. Psychological considerations, Orientation and
counseling, Deniers models. Prereq: 473, 507, 543 and
542 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 Audiologic Assessment (3) Theoretical bases
for behavioral audiology and acoustic immittance
measurement.

547 Special Problems in Audiology (1-3) Prereq:
473 or equivalent and consent of instructor. May be
repeated. Maximum 6 hrs.

552 Seminar in Speech Pathology (2-3) Current
significance of research and developments in pathol-
ogy. Prereq: 506 or equivalent or consent of instruc-
tor. Prereq: 9 hrs in speech pathology. Prereq: Consent
of department. Maximum 9 hrs.

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

556 Independent Study in Speech-Language Path-
ology (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 con-
sent of instructor.

563 Language Disorders: Birth to Three (3) Over-
view of family-focused, transdisciplinary intervention
process. Assessment/treatment of infants, toddlers,
and preschoolers. Description of disabilities and re-
sulting communication disorders. Prereq: 461 or equiva-
 lent or consent of instructor.

574 Pediatric Audiology (3) Theoretical and practi-
cial considerations in evaluation and treatment of hear-
ing loss in infants and children. Audiological interven-
tion in case management of hearing impaired child:
amplification, educational alternatives, and state and
federal guidelines.

576 Physiologic Assessment of the Auditory Sys-
tem (3) Ototoxicity, electrophysiology, and audi-
atory brainstem responses. Anatomical or-
gins, principles, and applications. Use of these re-
sponses in infants and children. Auditory function and deters-
mination of site-of-injury. Prereq: 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
electronystagmography. Prereq: 507, 542, 546, and
576, or equivalents, or consent of instructor.

581 Assessment of Central Auditory Processing
(3) Overview of current central auditory processing
disorder (CAPD) literature and assessment proce-
dures, with emphasis on a holistic view by combining
perceptual, electrophysiological, linguistic, and cogni-
tive measures. Prereq: 546, 574, and 594, or equivalents
or consent of instructor.

582 Speech and Language Services in School (3)
Organization and evaluation of speech and lan-
guage programs in schools.

583 Physiologic Assessment of the Auditory System
II (3) Middle-latency, long-latency, and event-
related potentials. Neuropsychological mechanisms,
principles, and applications. Use of these potentials in
evaluation of neurodevelopmental and cognitive function.
Prereq: 576 or equivalent or consent of instructor.

584 Amplification for Children with Hearing-Im-
pairment (3) Study of strategies for selecting and
fitting amplification systems for children; outcome
measures and service coordination. Prereq: 543,
544, and 574 or equivalents or consent of instructor.

585 Cochlear Implants (3) Overview of cochlear
implants, focusing on theory of auditory stimulation
and individual implant systems; candidacy, surgical
preparation, and follow-up/outcome measures; the
rehabilitation process; and cochlear implant case pre-
sentations. Prereq: 507, 576, and 583 or equivalents
or consent of instructor.

586 Standards and Practice Issues in Audiology
(3) Overview of professional practice standards,
ethics, medical/legal issues, business practices, and
reimbursement related to auditory and audiological
practice. Prereq: 512 or equivalent or 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.

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

595 The Verbotonal System: Auditory/Speech Per-
ception (3) Innovative therapy, therapy procedures,
and SUVAG amplification/filters for diagnosis/evalua-
tion/remediation of spoken language/listening skills of
hearing-impaired children/adults; use of rhythm,
movements and suprasegmentals; special audiomet-
ric tests, acoustic filters, correcting misarticulations
through optimal listening; central auditory treatment;
second (foreign) language through listening/spoken
language; relationship of concepts/practice; student research reports. Prereq:
305 Phonetics, 473, and 494 or equivalents or con-
sent of instructor.

600 Doctoral Research and Dissertation (3-15)
S/U only.

601 Experimental Phonetics (3) Acoustical and per-
cep
tual analyses of speech production and overall
oral communication. Prereq: 473 or consent of instruc-
tor.

602 Psychoacoustics (3) Auditory perception and
reception of nonspeech and speech stimuli. Prereq:
507 and 610, or equivalents, or consent of instructor.

607 Advanced Anatomy and Physiology of the Ear
(3) Anatomical and physiological correlates in hearing
science. Cochlear mechanical function, neuropsy-
chological response and theoretical considerations.
Prereq: 507.

609 Seminar in Speech Science (2) Experimental
areas: speech physiology, acoustical analysis, recog-
nition, perception and intelligibility of speech,
communication theory, and psycholinguistic measure-
ment of speech and language. Topics vary. Prereq:
601 or consent of instructor. May be repeated. Max-
imum 6 hrs.

610 Seminar in Hearing Science (3) Advanced study
of perception of nonspeech acoustic signal, detect-
ability, pitch, loudness, differential threshold, adapta-
tion, and fatigue. Prereq: 507 and 546 or equivalents
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 journal articles, computer tools for experimental designs.
Prereq: Consent of instructor.

613 Externship in Audiology (1-9) Off-campus
clinical training experience. Prereq: Consent of aca-
demic advisor. May be repeated. Maximum 36 hrs.

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

650 Advanced Seminar in Audiology (3-6) Topics
vary. Prereq: Consent of instructor. May be repeated.
Maximum 9 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 symbolization. Prereq: Consent of
instructor. May be repeated. Maximum 8 hrs.

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

656 Directed Research (1-4) Participation in ongoing
or non-dissertational research. 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. Maxi-
 mum 6 hrs.

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

661 Advanced Seminar: Language Disorders in
Children (3) Topics vary. Prereq: 561 or consent of
instructor. May be repeated. Maximum 6 hrs.

Aviation Systems
(UT Space Institute)

MAJOR

DEGREE

AVIATION SYSTEMS

Frank G. Collins, Co-Chair
Ralph D. Kimberlin, Co-Chair

Professors:

Collins, F. G., Ph.D. ................. California
Kimberlin, R. D. (Liaison), Ph.D. .................. RWTH (Germany)

Associate Professor:

Soles, U. P., Ph.D. ................. Tennessee

Research Assistant Professor:

Stellar, Frederick W., M.S. ...... Georgia Tech
Emeriti Faculty:

Mason, A. A., Ph.D. ................. Tennessee
Paludan, C. T., Ph.D. ................. Denver
Wu, J. M., Ph.D. .................... Cal Tech
Young, R. L., Ph.D. ................. Northwestern
The University of Tennessee Space Institute offers a program leading to the Master of Science degree with a major in Aviation Systems. The Aviation Systems program is designed for those who possess a bachelor’s degree in engineering or science and wish to study under a “system philosophy” toward careers in research and development or administration in areas pertinent to aviation. Current emphases include flight testing, aircraft design, aviation meteorology, air traffic control, and airport management.

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. Six hours of electives from 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. Two 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.

**GRADUATE COURSES**

500 Thesis (1-15) P/NP only.
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/NCG only. E.
503 Air Vehicles (3) Current capabilities and future requirements for civilian and military air vehicles. Parameters significant for air vehicle type selection. Integration of air vehicle into aviation systems. 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 mission requirements, synthesis and optimization techniques, safety and reliability, system integration, standards and regulations, teamwork and decision-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 clutter. Pulsed operation, coding, filters, processing techniques, Doppler effects. Problems of range and range rate 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 functions, 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 loads, load factors; simplifying assumptions to safe side: basics of stress and strain, elasticity, shear, bending, torsion; statically indeterminate systems; frames; structural instabilities, buckling of columns, thin plates; tension field beams; 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 Aviation Applications 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 LAAS.
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 observer and designer 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:
Becker, J. M., Ph.D. ......................... Cincinnati
Ganguly, R., Ph.D. ......................... Nebraska
Handel, Mary Ann (Distinguished Professor), Ph.D. ......................... Kansas State
Howell, E. W., Ph.D. ....................... Lehigh
Jeon, K. W., Ph.D. ......................... London
Joy, D. C. (Distinguished Scientist), Ph.D. ....................... Oxford
Kennedy, J. R., Ph.D. ....................... Iowa
Koontz, John W., Ph.D. ..................... Kentucky
MacCabe, J.A, Ph.D. ....................... California (Davis)
McKee, B. D., Ph.D. ....................... Michigan State
Monty, K. J., Ph.D. ......................... Rochester
Peterson, C. B., Ph.D. ..................... LSU
Roberts, D. M., Ph.D. ..................... California (Davis)
Serpersu, E., Ph.D. ......................... Haceteppe

Associate Professors:
Bruce, B., Ph.D. ......................... California (Berkeley)
Hall, J. C., Ph.D. ......................... Illinois
Prosper, R. A., Ph.D. ..................... Illinois

Assistant Professors:
Dealwis, C., Ph.D. ......................... London
Fernandez, E., Ph.D. ...................... Loyola
Guo, H., Ph.D. ............................. Harvard
Jain, N., Ph.D. ............................ Brandeis
Park, J., Ph.D. ............................ Texas A&M

Research Professors:
Allison, D. P., M.S. ..................... Tennessee
Hartman, F., Ph.D. ....................... Tennessee
Mazur, Peter, Ph.D. ...................... Harvard

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.
6. A final examination that covers both the thesis endeavor and the subject matter of the course requirements.

THE DOCTORAL PROGRAM
1. Biochemistry and Cellular and Molecular Biology 511-12-13, 515-16, and 517.
2. At least two additional approved graduate courses in the life sciences or chemistry, or physics, or other physical science to be determined upon consultation with the mentor and the dissertation committee.
3. No survey courses will be accepted.
4. At least 6 hours of topics offered in 615 or its equivalent.
5. Participation in 601 and 603 during the entire period of residence. Participation in at least one journal club chosen from among 605-608 for six semesters.
6. Comprehensive examination, taken before the end of the third year of study.
7. A dissertation reporting the results of original and significant research carried out during the term of candidacy.
8. A final oral examination which will be concerned primarily with the student’s dissertation.

Petitioning for Master’s Degree
Students who have passed the comprehensive examination in the Ph.D. program and have completed at least 30 hours of approved coursework for graduate credit, at least two thirds of which must be at or above the 500 level, may petition the department for award of a master’s degree. The additional requirements for such a degree are:
1. The preparation of a research manuscript suitable for submission for publication in a major scientific journal and oral defense of that manuscript before an examining committee of three faculty members appointed by the head of the department, at least two of whom shall be members of the department; or
2. Publication of at least one full-length paper in a major scientific journal as senior author.

GRADUATE COURSES
401-402 Biochemistry-Molecular Biology I, II (4,4)
401—Amino acid structure and chemistry, protein structure and chemistry, protein folding, enzyme behavior and function, reaction mechanisms, catalysis, enzyme inhibition, and protein transport. 402—Structure of DNA and RNA, experimental methods of analyzing nucleic acids, mechanisms of RNA and protein synthesis, covalent and mechanical regulation of DNA replication, repair and recombination, chromosome structure and function, regulation of gene expression, genome structure and genomics, and mechanisms of biological regulation. Prereq: Biology 240 General Genetics, Chemistry 350-360-369 Organic Chemistry and Lab.

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)
Electrolyte behavior, chemistry and structure of proteins; enzyme behavior and biological function; catalysis and enzyme inhibition; synthetic metabolism; reaction mechanisms of nucleic acid function; protein synthesis, and biochemical genetics. Prereq: 401 and 402. Lab 4 h.

419 Cellular and Comparative Biochemistry Lab (2) Experiments with enzymes, nucleic acids, and membranes and organelles. Chromatography, kinetics, hybridization, sequencing, and immunochemical methods. Prereq or coreq: 410 or 411.

421 Cell and Tissue Structure and Function (4)
Study of animal cells and tissues at light and electron microscope 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 electron microscopy. Experiment design, execution, data analysis, and peer evaluation. Prereq or coreq: 410 or 411.


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.)

480 Physiology of Exercise (3) (Same as Exercise Science 480.)

500 Thesis (1-15) P/NP 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 for faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.
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.

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.

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.

515 Experimental Techniques 1 (4) Modern experimental methodology and instrumentation lab. cell growth; spectrophotometry; microscopy; nucleic acid purification and analysis; protein assays; enzyme purification; electrophoresis; computer analysis of nucleic acid and protein sequences. Lecture on theory of laboratory to accompany two lab periods per week. Primarily for departmental graduate students. Prereq: Consent of instructor.

516 Experimental Techniques 11 (3) Laboratory rotations. Students work in laboratory of faculty member on clearly defined project. Written proposal and oral report. Primarily for departmental graduate students. Prereq: 515. S/NC only.

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; electrophoresis. Prereq: 511 or consent of instructor.

520 Special Topics (1-3) Selected directed readings or special course in topics of current interest. Consent of administration 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. Max 12 hrs.

530 Experimental Design and Analysis (2) Development of skills in strategies of 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: Consent of instructors.

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.

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 Ecol and Evol/Ecology 561.)

562 Introduction to Electron Microscopy - Transmission Electron Microscope (4) Practical application to techniques for preparation of biological samples for viewing in transmission electron microscopy. Use of microscope and ancillary equipment, darkroom techniques, preparation of materials for publication and special project. Admission limited only to departmentally approved graduate students. (Same as Botany 510.) 2-3 hr labs.

564 Introduction to Electron Microscopy-Scanning Electron Microscope (3) Practical introduction to techniques 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.

570 Advanced Concepts in Cellular/Molecular Biology (3) Concepts related to cellular/molecular biology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

580 Advanced Concepts in Genetics/Developmental Biology (3) Concepts related to genetics/developmental biology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

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

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

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

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

601 Departmental Seminar (1) Invited speakers. Topics posted in advance. Required every semester in residence. S/NC only.

603 Graduate Research Colloquium (1) Seminars and lectures dealing with current advances in fields of biochemical and biophysical methods. mechanisms of enzyme catalysis, gene expression, membrane structure and function, metabolic regulation, physiological, molecular biology, and related topics. Required every semester in residence. S/NC only.

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 (1-3) 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. Max 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, physiological, molecular genetics, cell ultrastructure and physiology, neurobiology, and related topics. Prereq: 511-12 or consent of instructor. May be repeated. Maximum 9 hrs.
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** 12
- **Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department)** 6
- **Program electives** 6
- **Thesis 500** 6

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

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

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

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

### Environmental and Soil Sciences

**Students seeking a Master of Science degree in Environmental and Soil Sciences** will generally concentrate their studies in one of the ESS focus areas. The focus areas include: soil and water chemistry; nutrient and elemental cycling; land management and reclamation; pedology; climatology; soil biology and biochemistry; and soil physical processes. Both thesis and non-thesis options are available. Please see the ESS Master’s concentration homepage for additional information: http://bioengr.ag.utk.edu/graduate/ or contact the ESS program’s graduate liaison.

**Applicants having Bachelor’s degrees in fields that are related or unrelated to environmental and soil sciences may apply, although acceptance may be contingent upon the completion of prerequisite course work. Submit application, official transcripts, scores from the general portion of the Graduate Record Examination, and a detailed statement of your goals and reasons for applying to ESS Master’s Program Coordinator, Biosystems Engineering and Environmental Science Department, University of Tennessee, 2506 E.J. Chapman Dr., Knoxville, Tennessee 37996-4531.**

**Thesis Option:** To obtain a Master of Science degree, the student must meet the following requirements, in addition to those of the university Graduate Council (as specified in the Master’s Degrees section at the front of this catalog).

1. Upon consultation with the department head, the student will be assigned a major professor who acts as chair of the student’s advisory committee. The student and the major professor will assemble a graduate advisory committee consisting of the major professor and a minimum of two additional faculty, each holding the rank of assistant professor or above. At least one-half of the committee members must hold teaching appointments. The advisory committee must be formalized by the end of the second semester of graduate study.

2. Develop and submit an approved program of study by the end of the second semester of graduate study. A minimum of 24 hours of graduate course work is required in the program of study, exclusive of six hours of 500 Thesis. The program of study is subject to the approval of the student’s advisory committee, and must meet the following requirements:

   - **500 Thesis** 6
   - **503 Seminar** 2
   - **Courses numbered above 503** 12
   - **Courses within the major (excluding courses numbered 503 and below)** 10
   - Courses that are in the major include those in Environmental and Soil Sciences. In addition, Geology 510 and Environmental Engineering 535 are in the major. The student’s committee may require additional course work beyond the 24 hours if the student’s progress or background indicates a need or deficiency.

3. Develop a research problem and presentation by means of a written proposal to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 500.

   - **Pass a final examination that integrates the student’s thesis and coursework, administered by the advisory committee. The student is expected to be conversant in the soil and environmental sciences, particularly in the thesis and allied areas.**

5. Present at least two departmental seminars (two hours of 503), in addition to an exit seminar (no credit.)
A student who has started a degree program under the thesis option is not eligible to transfer to the non-thesis option after the end of the first semester of graduate study or after receiving a graduate assistantship stipend for more than one semester.

**Non-Thesis Option:**
A student desiring the non-thesis option must declare his/her intention before the beginning of the second semester of study. The student must meet the following requirements, in addition to those of the university Graduate Council (as specified in the Master's Degrees section at the front of this catalog).

1. Upon consultation with the department head, the student will be assigned a major professor who acts as chair of the student's advisory committee. The student and the major professor will assemble a graduate advisory committee consisting of the major professor and a minimum of two additional faculty, each holding the rank of assistant professor or above. At least one-half of the committee members must hold teaching appointments. The advisory committee must be formalized by the end of the second semester of graduate study.
2. Develop and submit an approved program of study by the end of the second semester of graduate study. A minimum of 33 hours of graduate coursework is required in the program of study. The program of study is subject to the approval of the student's advisory committee, and must meet the following requirements:
   - 503 Seminar 2
   - 593 Special Problems in Environmental and Soil Sciences 3
   - Courses numbered above 503 (exclusive of 593) 18
   - Courses within the major (excluding 500 and 502) 12
   - Courses that are in the major include those in Environmental and Soil Sciences. In addition, Geology 510 and Environmental Engineering 535 are in the major. The student's committee may require additional course work beyond the 33 hours if the student's progress or background indicates a need or deficiency.
3. In lieu of a thesis, students are required to complete three hours of 593 by participating in a single research program for a period of 12 weeks. The advisory committee approves the research problem. Satisfactory completion of this requirement requires a written, original research report that is acceptable to the student's committee.
4. Pass a comprehensive written examination that integrates the student's course work and research problem. The exam is developed and administered by the advisory committee. A student who has started a degree program under the non-thesis option may transfer to the thesis option upon approval of a potential major professor and the department head.

### THE DOCTORAL PROGRAM

A doctorate in Plants, Soils and Insects (PSI), with a concentration in Environmental and Soil Sciences (ESS), is offered under a multi-departmental doctoral program. Three departments participate: Plant Sciences, Entomology and Plant Pathology, and the soils faculty in Biosystems Engineering and Environmental Sciences. Other concentrations within the PSI doctoral program include horticulture, crop sciences, weed biology, plant improvement, entomology, plant pathology, integrated pest management and plant bioactive compounds. Focus areas in the ESS concentration include soil and water chemistry; nutrient management; pedology, genesis and classification; environmental climatology; soil biology and biochemistry; and soil physical processes. Please see the ESS doctoral concentration homepage for additional information, [http://bioeng.ag.utk.edu/graduate/](http://bioeng.ag.utk.edu/graduate/), or contact a faculty member in the area of interest.

### Admission Requirements
Submit application, fee, official transcripts, and scores from the general portion of the Graduate Record Examination to the Graduate Admissions Office. In your application, indicate that you are applying to the Plants, Soils and Insects doctoral program. Submit resume, three letters of reference (or three Graduate Rating Forms), photocopy of GRE scores and a short statement of professional goals and reasons for applying to: ESS PhD Program Coordinator, Biosystems Engineering and Environmental Sciences Department, University of Tennessee, 2506 E.J. Chapman Drive, Knoxville, Tennessee 37996-4531.

In your statement letter and application, please indicate your interest in the ESS concentration.

### Degree Requirements
To obtain the doctorate, the student must meet the following requirements:
1. The student and the major professor will select a minimum of three additional faculty, holding the rank of assistant professor or above, to serve on the student's doctoral committee. The major professor and two committee members must be approved to direct doctoral research by the Graduate Council, and at least half of the committee must hold teaching appointments. At least one member of the committee must be from outside the department. The doctoral committee must be formalized by the end of the second semester of graduate study.
2. Submission of an approved program of study by the end of the second semester of graduate study. A candidate for the doctoral degree must complete a minimum of 24 hours of graduate coursework numbered 503 or higher beyond the master's degree. Candidates not having a masters degree must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree, 24 hours of which must be numbered 503 or higher. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. At least 9 hours of the student's coursework must be from outside the PSI major, and a minimum of 6 semester hours must be taken in UT courses numbered 601 or higher. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.
3. Pass a comprehensive examination as required by the student's doctoral committee.
4. Pass the comprehensive oral examination of the proposed dissertation and related fields. The candidate will be tested on his/her knowledge of the proposed dissertation and related fields. The student is expected to be conversant in the wide area of soil and environmental sciences.
5. Presentation of at least two departmental seminars (2 hours of ESS 503), in addition to an exit seminar (no credit).

Please see the Degree Program Requirements/Doctoral Degrees section at the front of this catalog for additional information.

### Biosystems Engineering

**Graduate Program**

**Major subject courses**
- Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be agreed by the department) 9
- Program electives 21
- Seminar (507, 505 or equivalent courses) 3
- 600 Dissertation 24

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.

### Biosystems Engineering

#### GRADUATE COURSES

**411 Mechanical Systems Engineering (3)**
421 Natural Resource Engineering (3) Introduction to hydrologic cycle: movement of water and interaction with environment through such processes as erosion and contaminant transport. Impacts through estimation and measurement, and controlling impacts through engineering design. Specific designs: waterways, erosion and sediment control structures, waste management, and application of systems and hydrologic monitoring systems. Prereq: 321 Biothermodynamics, Heat, and Mass Transfer; Environmental Technology 310 Introduction to Soil Science; Civil Engineering 390 Hydraulics; or Aerospace Engineering 341 Fluid Mechanics. 2 hrs and 1 lab.

431 Bioprocessing Engineering (3) Application of basic engineering principles to processing and handling of biological materials: physical, chemical, biological properties; materials handling; material conversion; drying; heat and moisture processing; and bioprocessing. Coreq: 321 Biothermodynamics, Heat and Mass Transfer or equivalent. 2 hrs and 1 lab.

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 processes. Prerequisites: 231 Differential Equations; Coreq: 321 Biothermodynamics, Heat and Mass Transfer. 2 hrs and 1 lab.

451 Electronic Systems (4) Basic electronics with biological applications. Analog and digital electronics; sensing; physical and chemical and biological sensors; electrical and sensory interfaces; signal conditioning; process control. Laboratory experiments and design projects. Prereq: Circuits and Electro Mechanical Components. 3 hrs and 1 lab.

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

502 Registration for Use of Facilities (1-15) Required for the final term of otherwise required courses taken 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.

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/NC only.

507 Professional Development Seminar (1) (Same as Agricultural and Natural Resources 507, Animal Science 507, Biosystems Engineering Technology 507, Environmental and Soil Sciences 507, Food Science and Technology 507, Plant Sciences and Landscape Systems 507.) S/NC only.

510 Similitude in Design and Research (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: Engineering Science 321, 341. 2 hr and 1 lab.

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

530 Research Problems in Biosystems Engineering (1-3) Independent study in advanced research leading to current problems in agricultural engineering. May be repeated. Maximum 6 hrs.

541 Principles of Compost Engineering (3) Comprehensive study of composting: survey of installed systems; thermodynamics of composting; biodegradation of plant materials; kinetics of heat inactivation; feed conditioning; aeration; substrate characteristics; process kinetics; design component. Prereq: Thermodynamics, heat and mass transfer.

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

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

550 Selected Topics (1-3) Lecture/group discussion on specialized topics. May be repeated. Maximum 6 hrs.

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); acquiring, managing, and analyzing spatially-locating 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.

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

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

620 Computer Simulation of Agricultural Systems (3) Scientific approach to digital simulation; system definitions and boundaries, formulation of models, mathematical 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.

636 Geospatial Methods for Environmental Research (3) Sampling and displaying the multidimensionality of environmental variables, Spatial and temporal sensing of the environment. Geostatistical mapping and interpretation; sampling theory; precipitation geomatic techniques for the environmental scientist and engineer. Prereq: 555 or equivalent. 2 hrs and 1 lab.

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

702 Processing and Environmental Systems (3) Mechanical Components. 3 hrs and 1 lab.

722 Processing and Environmental Systems (3) Environmental systems in plant and animal production, application of digital simulation, mechanical equipment, structures, crop processing and materials handling. Prereq: 506. 2 hrs and 1 lab.

732 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 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.

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

754 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.

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.
Environmental and Soil Sciences

GRADUATE COURSES

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

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

444 Transport Processes in Soil (3) Basic understanding of soil physical properties and processes; influence of physical properties on water and chemical movement in soil; practical experience in the measurement and analysis of soil physical properties, water flow, and chemical movement in soil. Prereq: 210 Introduction to Soil Science and Physics 221 or equivalent.

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 and automated weather stations. Prereq: Agriculture and Natural Resources 290 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.

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

501 Seminar Preparation (1) (Same as Plant Sciences and Landscape Systems 505.)

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.

503 Seminar (1) Presentations and discussion of current scientific material. May be repeated. Maximum 3 hrs.

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Food Science and Technology 507 and Plant Sciences and Landscape Systems 507.) S/NC only.

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 response to adverse soil environmental conditions. Prereq: 434 or Integrated Plant Systems 431 or Plant Sciences and Landscape Systems 431 or general plant physiology. 3 hrs and 1 rec.

512 Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: 442 or consent of instructor. 2 hrs and 1 lab.

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, ion exchange equilibria, surface functionality and reactivity, adsorption phenomena, and surface complexation modeling. Prereq: 434 or consent of instructor.

514 Environmental Soil Physics (3) Principles of water, gas, and solute movement in soil/water systems; application of appropriate models for the description of these processes; methods for characterizing hydraulic and chemical transport properties of soils; identification of soil properties for solution of contemporary problems in water conservation, prevention of surface/ground water contamination, and management of plant water status. Prereq: 444 or equivalent.

516 Soil Biology and Biochemistry (3) Soil organisms and their activities in soils: soil ecology, biochemical cycling of important elements, organic matter transformation, and applications of agricultural and environmental biology and biochemistry. Prereq: 210 Introduction to Soil Science or consent of instructor. 2 hrs and 1 3-hr lab.

593 Special Problems in Plant and Soil Science (1-3) May be repeated. Maximum 6 hrs.

600 Doctoral Research and Dissertation (3-15)

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.

613 Advanced Topics in Soil Chemistry and Fertility (2) Topics of current significance; scientific literature. Prereq: 513 or equivalent.

614 Advanced Topics in Soil Biology and Biochemistry (2) Topics of current significance; scientific literature. Prereq: 516 or equivalent.

615 Advanced Topics in Soil Physics, Genesis, and Morphology (2) Topics of current significance; scientific literature.

Botany

(College of Arts and Sciences)

MAJOR

DEGREES

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

Edward E. Schilling, Head

Professors:

Caponetti, J. D., Ph.D. ..................... Harvard

Hickok, L. G., Ph.D. ....................... Massachusetts

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

Associate Professors:

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

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

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

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

von Arnim, A. G., Ph.D. ............. East Anglia (UK)

Assistant Professors:

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

Nebenfuehner, A., Ph.D. .......... Oregon State

Small, R. L., Ph.D. ..................... Iowa State

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, plant, microbiology, cytology, cytogenetics, ecology, genetics, lichenology, molecular biology, morphology, mycology, physiology, plant biology, and systematics.

The normal service 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: 8 semester hours. Physical science: general inorganic chemistry; 8 semester hours; organic chemistry: 8 semester hours. Physics highly recommended.

2. Advanced botany or closely allied biological sciences: 12 semester hours.

3. Professional sciences: general inorganic chemistry; 8 semester hours; organic chemistry; 8 semester hours. Physics highly recommended.

4. College mathematics: 6 semester hours including 1 term of calculus.

5. Evidence of a broad undergraduate background, an ability to do work of graduate quality. Finally, 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 study. 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-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 preparation 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 the completion of the degree. Most students spend from three to five years working on their Ph.D.

Requirements for successful completion of the Ph.D. are as follows:
1. Satisfactory presentation of a research proposal 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 completion of 6 hours at the 600 level (excluding dissertation).
6. 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. Some stipulations or specific 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: botany, lichenology, mycology, agrostology, mycology; phycology; aquatic vascular plants, systematic botany, 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. Genome 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 sequencing 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.)
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. Recommended prereq: 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/NP 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.
503 Non-Thesis Research (2) Library, field, or laboratory research under supervision of staff member. Not for thesis candidates. May be repeated. Maximum 4 hrs.
506 Phycology (4) Comparative study of major algal phyla, both freshwater and marine: morphological, developmental, ecological, taxonomic and phylogenetic aspects. Field and laboratory studies, identification, classification, experimentation. Prereq: 310 or consent of instructor. 3 hrs and 1 lab.
507 Biological Illustration (3) Principles and applications of photography (B/W and Color) photo-macro- 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 - Transmission Electron Microscopy (4) (Same as Biochemistry and Cellular and Molecular Biology 562.)
530 Advanced Taxonomy of Flowering Plants (3) Evolution and classification of families of angiosperms, local flora. Prereq: 330 or equivalent. 2 hrs and 1 lab.
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 Investigation (1) Appropriate methods and instrumentation. Topics vary. May be repeated with consent of instructor. Maximum 5 hrs. S/NC only.
599 Advanced Evolutionary Ecology (3) Advanced concepts in evolutionary and ecological genetics. Bio- geography, climate, population genetics, evolution and natural selection, population growth and regulation, competition, niche, experimental ecology, predation, phylogenetics in ecology, biodiversity and conservarion. 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.)
600 Doctoral Research and Dissertation (3-15) P/NP only.
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, pathology and ecology. May be repeated. Maximum 12 hrs.
662 Seminar in the History of Botany (2) History of botanical exploration and advances from early civi- lized to modern periods. May be repeated. Maximum 4 hrs.

Business Administration (College of Business Administration)

MAJOR DEGREES

Business Administration ......................... MBA, J.D.-MBA, M.S.-MBA, Ph.D.

The College of Business Administration offers two college-wide programs, the MBA and the Ph.D. with a major in Business Administration. Two tracks are available for the MBA: the regular, full-time program and the executive program.

The full-time MBA is for students seeking a full-time, weekday program that follows the traditional academic format. The nature of this program precludes students from simultaneously working full-time outside of
school. In addition to the regular full-time program, there are two full-time dual-degree programs: the J.D.-MBA with the College of Law and the M.S.-MBA with the College of Engineering. Descriptions of these dual-degree programs follow the description of the executive tracks of the MBA. For students who wish to continue working full-time while they earn their MBA degree, there are three programs within the executive track of the MBA. In these programs, students carry a full academic course load in addition to their full-time jobs. Each of these programs is designed for the working student, the group of students. Descriptions of the MBA programs in the executive track follow the description of the regular, full-time program.

To obtain an MBA application, contact the MBA Program Office, 527 Stokely Management Center, College of Business Administration, The University of Tennessee, Knoxville, Tennessee 37996-0525, Tel: (865) 974-5033, Email: mba@utk.edu. The application may also be downloaded from the web site at http://mba.bus.utk.edu. For the executive programs, contact the Center for Executive Education, 708 Stokely Management Center, College of Business Administration, The University of Tennessee, Knoxville, Tennessee 37996-0575, Tel: (865) 974-5001.

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, the 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. During the summer between the second and third semesters, students must complete an internship with a company using those skills acquired during the first year of the MBA program.

The MBA program consists of a common core (32 hours) and a selection of concentration and elective courses (15 hours). The first-year core develops a general management foundation upon which specialization is developed in the concentration area.

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 management course 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, 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 items 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 admission to the MBA program, consideration is given to (1) applicant’s academic record with particular attention to the last two years of undergraduate work and prior college 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 grade point averages or GMAT scores. However, admission preference will be given to applicants with full-time work experience after obtaining the undergraduate degree.

Prerequisites

There are no specific course prerequisites for admission. However, undergraduate courses and work experience should demonstrate 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 4-hour career development course taken in the first semester (Fall 1), a 9-hour core 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. The first theme covers “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 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-based environment. Many core requirements are experiential exercises in which self-discovery within a team setting is an important element of the learning process. Individualized support is provided for developing both written and oral communication skills.

Concentration and Electives

A concentration area may be indicated on the MBA Program Application or this declaration may be deferred until after matriculation. In any event, selection 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/elective blocks, 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 6 hours of work at this institution are included in the concentration area).

Elective Area: 3 hours

Because of the fully integrated nature of the first-year curriculum, no credit hours are transferred into this core curriculum. The 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, 555) and 9 credit hours of projects applied within the student's business organization (BA 561, 562, and 563). Students carry a full, 15-credit-hour load each semester. In each program, all participants begin and complete the program together.

The courses are functionally integrated, and the broad curriculum objectives are similar in each of the executive track programs. All are oriented toward applied learning and are highly interactive, making extensive use of experiential learning techniques. Emphasis and depth of subject matter 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, as evidenced by 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) (see 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 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 in this program is to provide a good grounding in the quantitative and qualitative tools of various business functions and a good basis in strategic thinking. Learning is expanded through applying these tools within the student's own organization through a structured project each semester. 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 via live, distance learning classes on Tuesday evenings. The program begins in August with an intensive week of classes, then continues with weekend classes. The final fall semester also includes an intensive week of courses in addition to weekend classes. Graduation is in December.

Applications are accepted for fall semester only. The application priority deadline is April 10.

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

Senior Executive MBA Program

The Senior Executive MBA is provided for a national audience of managers holding middle and upper level positions in organizations that support the 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 Senior Executive MBA places considerable emphasis on global business and on individual skills of leadership. The program also has a heavy emphasis on strategic thinking and leadership management concepts. The Senior 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 Senior Executive MBA is three consecutive semesters completed in 12 months. The class meets in Knoxville for 11-day residence 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 distance learning classes and requires substantial and regular contact with faculty and other participants. The project work in the Senior Executive MBA is a large-scale management project running throughout the year. Students work with managers in their own organizations to choose a project of significant scale and scope. Each 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 depending on work experience. Students will receive materials for study in mid-November preceding the January start date.

Additional information on the executive MBA can be found at www.emba.utk.edu.

Physician Executive MBA

The Physician Executive MBA is provided for a national audience of physicians. The students for whom this program is designed have an M.D. or D.O. degree with five or more years of work experience. The curricular objectives are the same as those for the executive MBA, but in the Physician Executive MBA, many of the functional skills are taught in the context of the health care industry with 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, in their own careers, and are seeking a program that allows them to continue their practice while earning their MBA degree.

The Physician Executive MBA is three consecutive semesters completed in 12 months. The class meets in Knoxville for 8-day residence periods in January, April, August and December. Between residence periods, live 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 Executive MBA can be found at www.pemb.a.utk.edu.

The Aerospace Executive MBA

The Aerospace Executive MBA is provided for a national audience of managers from defense and commercial aerospace organizations. The students for whom this program is designed have five to ten years of work experience and are currently employed in the aerospace sector. The emphasis in this program is providing a solid grounding in the broad range of business functions comprising virtually all MBA programs. However, much of this coverage will be delivered within the context of the aerospace industry. Beyond a basic grounding in business fundamentals, this program will offer advanced concepts especially relevant to managing the complex value streams that produce today's most advanced aircraft. Advanced coverage and emphasis will be given to value stream integration, lean manufacturing, and industrial statistics in particular. This mix of topical coverage is ideal for engineers and others with technical backgrounds who are transitioning into program management where business and leadership skills are critical.

The program starts each fall semester and is completed in three consecutive semesters spread over twelve months. Classes are held during six residency periods, lasting from eight to eleven days each, some of which may be hosted on-site at the facilities of...
organizations participating in the program to facilitate hands-on learning. Between residency periods, formal coursework continues with bi-weekly distance learning through live, Internet "cyber classes." Additional graded work includes a number of large-scale projects completed under faculty supervision, resulting in significant written reports and oral presentations.

Applications to this program are accepted for a fall entry only. The early application deadline is May 1, and the final application deadline is August 1, each year. Scores from either the Graduate Management Admissions Test (GMAT) or the Graduate Record Examination (GRE) are required as part of a complete application.

The program will not be offered in those years in which the enrollment is not sufficient.

**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 hour of credit toward the J.D. for acceptable performance in approved graduate-level courses offered by the College of Business Administration. The College of Business Administration will award up to 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 Asst. 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 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 (concentration in 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 objective of the dual degree program is to prepare graduates to take a leadership 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.

**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

August—First Year
BA 511 MBA Core I 3
BA 512 MBA Core II 15
IE/ME 504 Product Development Process 1

Spring
BA 513 MBA Core III 9
IE/ME 506 Product Selection and Evaluation 2
IE/ME 508 Integrated Product, Process, and Manufacturing System Design 3

Summer
— Internship —
BA 514 Integrated Business Simulation 3
IE/ME 509 Multidisciplinary Project 1

Fall—Second Year
IE 511* Business Planning and Commercialization 3
IE/ME 509 Multidisciplinary Project 1
— Engineering major 9-12

Spring
— MBA "hub" course elective 3
IE/ME 509 Multidisciplinary Project 1
— Engineering major 6-9

Summer (first session)
IE/ME 594 Culminating Integrated Project Report 3
TOTAL 63-69

*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 recommendations 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 are dedicated to dissertation; includes 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 seven concentrations offered in the Ph.D. program:
Accounting
Finance
Human Resource Development
Logistics and Transportation
Management (Operations Management and Strategic Management)
Marketing
Statistics

More detailed information concerning these specific areas is available by writing directly to each department or by accessing the College of Business Administration web page.

Degree Requirements
Doctoral students must file a program of study that has been approved by their doctoral committee within one year of completing their first year of doctoral studies. This committee is nominated by the department chairperson in a student’s intended area of concentration, subject to the Graduate Council’s policies and procedures. Following are specific degree requirements:

1. Students must complete at least three years of full-time coursework beyond the baccalaureate degree, with two years of residence on the Knoxville campus.

2. Students are required to have a sound and broad base on which to build their Ph.D. coursework. The departmental doctoral advisor will work with the student to determine what, if any, courses need to be completed. All such work is subject to approval by the temporary doctoral advisory committee and the Dean of the MBA Program. Specific concentrations may have prerequisites.

3. Research Tools: A minimum of 9 semester hours of graduate research methods must be completed. At least 6 semester hours in statistics courses beyond Statistics 531 are required. The remaining 3 semester hours may be completed in addition to the specific concentration (such as Statistics 531) or in other areas such as research methodology, management science, computer science, econometrics, and psychometrics.

4. Concentrations: The concentration is the focal point of the Ph.D. program. Students are expected to master the literature and research techniques in the concentration area and to do quality research as evidenced by the preparation of an acceptable dissertation. A minimum of 12 semester hours of coursework is required, including at least 9 hours of doctoral seminars. Graduate work taken in the concentration at other institutions is considered by the temporary doctoral advisory committee in approving the specific coursework required. Available concentrations are: accounting, finance, logistics/transportation, management (operations management and strategic management), marketing, and statistics. See the appropriate fields of instruction for specific course requirements.

5. A minimum of 9 semester hours of graduate coursework is required in an area outside, but complementary to, the concentration. The student may choose the cognate from one of the following: one of the seven concentration business areas listed above, economics, or a related area in another school or college of the University. Hybrid cognates combining courses from multiple disciplines are permitted with the approval of the doctoral advisor and the temporary doctoral advisory committee.

Comprehensive Examinations
Comprehensive written examinations over the concentration area are required of each person seeking candidacy for the Ph.D. degree. This examination is administered in two sessions of approximately four hours each. Students qualify in the cognate area by completing a one-session, four-hour examination or an equivalent jointly approved by the student’s major professor and the student’s advisor in the cognate area. Comprehensive examinations are generally offered during the fall and spring terms. Comprehensive examinations must be taken within five years of matriculation.
When either the concentration or cognate area examination is passed, the remaining examination must be passed within the next 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 effort.

The dissertation normally must be completed within three years of the student’s advancement to candidacy.

**ACADEMIC STANDARDS**

A graduate student in the College of Business Administration whose 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.
Chemical Engineering

(College of Engineering)

MAJOR DEGREES

Chemical Engineering .................................. M.S., Ph.D.
John R. Collier, Head

Professors:

Bienkowski, Paul R., Ph.D. ......................... Purdue
Coehran, Hank D. (Adjunct), Ph.D. ........ M.I.T.
Collier, John R., Ph.D. ......................... Case Western
Counsel, Robert M., Ph.D. ........................... Tennessee
Moore, Charles F. (Alumni Professor), Ph.D. ........................... Louisiana State
Sheth, Atul C. (UTSI), Ph.D. .......... Northwestern

Associate Professors:

Bruns, Duane D., Ph.D. ......................... Houston
Edward, Brian J., Ph.D. ....................... Delaware
Frymier, Paul D. (Liaison), Ph.D. ........ Virginia
Peterson, Simiono (Research), Ph.D. ............... Iasi Tech

Wang, Tse-Wei, Ph.D. ......................... M.I.T.
Weber, Frederick E., Ph.D. .......... Minnesota

Assistant Professors:

Keffler, David J., Ph.D. ...................... Minnesota
Emeriti Faculty:

Prados, John, Ph.D. ......................... Tennessee

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 586).

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 candidate's thesis may be offered as such evidence.

Department requirements consist of the satisfactory completion of:

1. Graduate courses in chemical engineering, amounting to approximately 24 semester hours, at least 9 of which must be in 600 series courses.

2. Supporting courses in related scientific and engineering fields amounting to approximately 24 semester hours, subject to approval by the student's faculty committee.

These related fields will normally include chemistry, mathematics, physics, and engineering.

3. The comprehensive examination, consisting of a written part and an oral part. The written component involves theoretical and experimental questions in such areas as 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 electives 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 (4) Selected 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 object oriented concepts used to design automation solutions: human-machine-interfaces, Workstations with modern industrial equipment, interactive graphics and visualization environment. Prereq: Process Dynamics and Control and consent of instructor.

483 Introduction to Reliability Engineering (3) (Same as Nuclear Engineering 483, Industrial Engineering 483, and Mechanical Engineering 483.)

484 Introduction to Maintenance Engineering (3) (Same as Nuclear Engineering 484, Industrial Engineering 484, Materials Science and Engineering 484, and Mechanical Engineering 484.)
580 Technical Review and Assessment (3) Preparation of critical review of literature in area related to chemical engineering with emphasis on application of student’s research in the development of new knowledge and technologies. Prereq: Consent of advisor.

581 Industrial Pollution Prevention (3) Principles and practical aspects of industrial waste minimization. Regulations and environmental impact of industrial processes; study of alternative waste minimization/management technologies. Prereq: Graduate standing in engineering or consent of instructor. (Same as Environmental Engineering 581 and Engineering 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) May be repeated. Maximum 6 hrs.

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 Chemical Engineering (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 utility and limitations of approach. Prereq: 575 or consent of instructor.

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

Chemistry

Degree Requirements

MAJOR

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

Michael Sepaniak, Head

Professors:

Adcock, J. L., Ph.D. ................ Texas
Baker, D. C. (Paul and Wilma Ziegler Professor), Ph.D. ................. Ohio State
Barnes, C. E., Ph.D. .................. Stanford
Bartmess, J. E., Ph.D. .......... Northwestern
Chambers, J. Q., Ph.D. .......... Kansas
Compton, R. N., Ph.D. .......... Tennessee
Cook, K. D., Ph.D. .......... Wisconsin
Dunning, T. (Distinguished Scientist), Ph.D. ........... California Institute of Technology
Feigerle, C. S., Ph.D. .......... Colorado
Guiochon, G. (Distinguished Scientist), Ph.D. ........... Ecole Polytechnique and Paris VI
Kabalka, G. W. (Robert H. Cole Professor, Distinguished Professor), Ph.D. .......... Purdue
Kovac, J. D., Ph.D. .......... Yale
Larese, J. Z., Ph.D. .......... Wesleyan (Connecticut)
Magid, L. J., Ph.D. .......... Tennessee
Magid, R. M., Ph.D. .......... Yale
Mays, J. W. (Distinguished Professor), Ph.D. ............ Akron
Pagni, R. M., Ph.D. .......... Wisconsin
Schweitzer, G. K. (Distinguished Professor), Ph.D. .......... Illinois
Sepaniak, M. J., Ph.D. .......... Iowa State
VanHool, W. A. (Paul and Wilma Ziegler Professor), Ph.D. .......... Johns Hopkins
Williams, T. F. (Distinguished Professor), Ph.D. .......... London
Woods, C. III, Ph.D. .......... NC State
Xue, Z. B., Ph.D. .......... California

Associate Professors:

Gilman, S. C., Ph.D. .......... Penn State
Turner, J. Ph.D. .......... Oxford
Young, D. G., Ph.D. .......... Ohio State
Zhad, B., Ph.D. .......... Akron
Zhang, X. P., Ph.D. .......... Pennsylvania

Assistant Professors:

Baker, D. C. (Paul and Wilma Ziegler Professor), Ph.D. ................. Ohio State

The Faculty of the Department of Chemistry at The University of Tennessee seek to prepare their students to join the international ranks of professional chemists in fundamental areas of chemistry as well as cross-disciplinary sciences in which chemical expertise plays a critical role in the development of new knowledge and technologies. Students planning to major in Chemistry for the master’s or doctoral degree will ordinarily have attained a satisfactory record in the traditional areas of chemistry. The Department, however, recognizes that modern chemistry transcends traditional disciplinary divisions. Therefore, it encourages students with undergraduate majors in chemical engineering, the biological sciences, physics, mathematics, computer science, or other fields to apply for admission to our program.

Admission to the graduate program and a student’s course of study in graduate school are decided on a case-by-case basis, taking into consideration an applicant’s undergraduate record (traditionally including one year, each, of general, analytical, organic, and physical chemistry, and one-half year of inorganic chemistry), performance on national graduate school tests, and departmental diagnostic exams. All applicants are required to take the general Graduate Record Examination.
THE MASTER'S PROGRAM

The department offers concentrations in six areas for the M.S.: analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, polymer chemistry, and physical chemistry.

The requirements for the M.S. in Chemistry consist of the satisfactory completion of:
1. Research and a thesis to give 6 to 12 hours of graduate credit in Chemistry 500.
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 courses based on performance on diagnostic 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 courses based on performance on diagnostic examinations.
4. Completion of the comprehensive examination series and defense of an original research proposal to give 2 hours of credit in Chemistry 501.
5. Eighteen additional hours in courses at the 400 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, 570-72-73, 590-94-95.
6. A final oral examination.

The Ph.D. program with concentration in physical chemistry is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department. Chemistry departmental requirements include passing the above degree requirements in chemistry with concentration in physical chemistry plus 6 additional hours in physics at the 500 level or above. Three of the additional physics hours can be used to satisfy the 18 hours requirement in item 5.

GRADUATE COURSES

430 Advanced Inorganic Chemistry (3) Atomic and molecular structure, electronic and magnetic properties, transferability of substituent chemical elements, nuclear and electronic structures, and applications of modern techniques for characterization and coordination, coordination, and nomenclature (Prereq: 430 Inorganic Chemistry).
471-81 Biophysical Chemistry (3,3) (Same as Biochemistry and Cellular and Molecular Biology 471-481.)
473-83 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 equilibria; simple phase equilibria; properties of solutions, 483 - 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.
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.
500 Thesis (1-15) P/NP only.
501 Chemistry Seminar (1) Lectures and discussion on current research. May be repeated. Continuous registration required for resident graduate students. 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.
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. Required background: Two semesters of physical chemistry.
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. 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, London field theories, solid state. Required background: One semester of inorganic chemistry.
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.
532 Experimental Methods of Inorganic Chemistry (3) Electronic, infrared, Raman, microwave, NMR, ESR, nuclear quadrupole, Mössbauer, mass, and photoelectron spectroscopy for characterization of inorganic compounds. Required background: One semester of inorganic chemistry.
540 Nuclear and Radiochemistry (3) Nuclear properties, radioactivity, radioactive decay processes, nuclear structure and models, nuclear reactions, radiation 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 angular effects on reactivity; introduction to reaction mechanisms. Required background: Two semesters of organic chemistry.
554 Organic Spectroscopy Laboratory (1) Use of IR, UV, MS and multinuclear FT/NMR spectrometers, development of problem-solving ability in area of spectroscopic characterization of organic molecules. Prereq: 360 or equivalent. Coreq: 553.
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.
571 Advanced Quantum Chemistry and Spectroscopy (3) Prereq: 570 or consent of instructor.
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.
573 Chemical Kinetics and Transport (3) Time-dependent phenomena in chemistry: chemical kinetics, chemical dynamics, transport theory. Required background: Two semesters of physical chemistry.
590 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles. Required background: Two semesters each of organic and physical chemistry.
594 Organic Chemistry of Polymers (3) Synthesis of monomers; mechanism, stereochemistry, sequence distribution, and kinetics of polymerizations, formation of block, graft, and network polymers. Reactions on polymers. Prereq: 590 or equivalent.
595 Physical Chemistry of Polymers (3) Conformation of macromolecules, solution and bulk properties, rubber elasticity, kinetics of polymerization, polymer thermodynamics. Prereq: 590 or equivalent.
600 Doctoral Research and Dissertation (3-15) P/NP only.
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.
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.
intervention and educational strategies. Many opportunities exist in CFS for graduate
students to become involved in research on children, youth, and families. The central
premise of graduate programs in CFS is the idea that scientific inquiry provides the most
effective means to improve the welfare of children, youth and families.
A cornerstone idea for CFS graduate programs is “development in context,” or the
perspective that human development is best understood in terms of interconnections
among families, neighborhoods, schools, communities, cultures, and international
environments. A more specific focus within this “development in context” perspective is an
emphasis on “children, youth, and families at risk.” Together, these two themes,
“development in context” and “children, youth, and families at risk,” are the foundations upon
which our graduate curriculum options are structured.

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 or departmental link on the

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 foci. 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 accred-
ted institution or equivalent, completion of the 12-hour foundation core in the CFS master’s
program, 3 hours of computationally-based, graduate-level statistics, and completion of a
thesis as part of the master’s degree.

THE MASTER’S PROGRAM

The Master of Science degree in Child and Family Studies provides a broad foundation
for understanding how children develop and how families function in today’s society. All
master’s candidates enroll in CFS foundation courses which include theoretical and
empirical surveys of the human development, child development, and family science
literatures plus a survey of methods of discovery used in child and family research.
All MS students are expected to engage in productive research culminating in a thesis or
project. Students choose to concentrate either in Child and Family Studies, leading to
doctoral study or careers in community agencies serving children and families, or
Early Childhood Education, leading to an educator career in early childhood or school
settings.

The Child and Family Studies concentration requires a minimum of 36 credits of
coursework: 12 credits in foundation coursework and 24 credits in specialization.
The CFS foundation courses include CFS
510, 511, 550, and 570.  The 24 additional
credit hours, selected with guidance of the
student’s master’s committee, are earned as
follows: 9 CR in CFS-prefix courses, 6 CR in
graduate electives, which may include CFS-
prefix courses, 3 CR in Statistics 531,
Statistics 537 or Social Work 605, and 6 CR
of thesis research in CFS 500. Students
seeking the M.S. with a major in Child and
Family Studies must select a master’s
committee chair and file a plan of study with
the department head after 12 hours of
graduate credit.

I. MS in Child and Family Studies

CFS Foundation Courses 12 CR
CFS 510 Theories of Human
Development
CFS 511 Research in Child Development
CFS 550 Theory and Research in Family
Studies
CFS 570 Research Methods in CFS

Computation-based Statistics 3 CR
Stat 531 Survey of Statistical Methods 1
or
Stat 537 Statistics for Research 1 or
SW 605 Analysis of Social Work Data 1

CFS Specialization Electives 9 CR
Three CFS-prefix graduate courses; may not
include directed study courses CFS 581
or 620; may include only 3 CR of special
topics courses CFS 580 or CFS 581.

General Electives 6 CR
Courses may be CFS-prefix courses or
may include courses from outside the CFS
curriculum.

Thesis Research 6 CR
CFS 500

Total 36 CR

The Early Childhood Education concentra-
tion is designed for students seeking a MS
degree along with initial teacher licensure in
early childhood education (Pre-K through
Grade 4). Students interested in a CFS MS
degree in ECE must apply for admission to
graduate study in CFS through the proce-
dures outlined above. (Application for
admission to the fifth year licensure program
in CFS ECE is a separate procedure and is
described in the CFS undergraduate catalog.
Admission to the fifth year licensure program
does not include admission to the CFS MS in
ECE program.) The course of study for CFS
MS in ECE students includes 12 CR in the
CFS foundation courses: CFS 510, 511, 550,
and 569.  18 CR in ECE core: CFS 512, 574,
575, 591; 3 CR of computation- or consumer-
based graduate statistics (Statistics 531,
Statistics 537, Social Work 605, or EP 550), 3
CR in ECE specialization electives, comple-
tion of a research project in CFS 569, and a
written comprehensive examination (36
credits).

II. MS in Early Childhood Education

CFS Foundation Courses 12 CR
CFS 510 Theories of Human
Development
CFS 511 Research in Child Development
CFS 550 Theory and Research in Family
Studies
CFS 569 Action Research in Early
Childhood Education
THE PH.D. PROGRAM

The department supports a doctoral program leading to a Ph.D. in Human Ecology. 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:
1. Completion of the foundation courses in the Master’s program: 510, 511, 550, and 570.
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 experiences); administration in community services (requires 566 or 563, 521 or SW 541, and one semester of an administrative apprenticeship); research emphasis requires 6 additional credits in research methods or statistics.
8. Minimum of 6 credits in a cognate area.
10. Minimum of 96 credits beyond the bachelor’s degree.

GRADUATE COURSES

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

625 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.


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 observation, and case studies. Prereq: Communications 442 or Psychology 613.


670 Secondary Analysis of Survey Data (3) Applied seminar in the analysis of survey data. Identification of data sources, accessing data, evaluation, and analysis of social science survey data. Nationally representative data sets relevant to study of families, youth, or children, SPSS analytic software. Prereq: 570 or equivalent, Statistics 532 or 537 or equivalent.

691 Analytic Reasoning (3) Analysis of quantitative methods and measures used in human development and family research: validity, reliability, causality, and generalizability. Prereq: 570. Required background: 9 hrs graduate coursework in child and family studies, and 6 hrs graduate-level statistics.

Civil and Environmental Engineering

(College of Engineering)

MAJORS DEGREES

Civil Engineering .................. M.S., Ph.D.
Environmental Engineering ............... M.S. (Ph.D. through Civil Engineering)

Gregory D. Reed, Head

Professors:
Bennett, R. M., PE, Ph.D. .......... Illinois
Burdette, E. G. (Fred N. Peebles Professor), PE, Ph.D. ..................... Ohio State
Chatterjee, A., PE, Ph.D. ............. NC State
Davis, W. T., Ph.D. ................... Tennessee
Deatherage, J. H., PE, Ph.D. .......... Tennessee
Drumm, E. C., PE, Ph.D. ............. Arizona
Goodpasture, D. W., PE, Ph.D. .......... Illinois
Reed, G. D. (Liaison), PE, Ph.D. .... Arkansas
Robinson, R. B. (Fisher Professor), PE, Ph.D. ..................... Iowa 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. .......... Tennessee
Penamadu, 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
Gentry, R., Ph.D. ............ Memphis
Huang, B., Ph.D. ................... Louisiana State
Ingram, E., Ph.D. ............... Tennessee

Emeriti Faculty:
Tschantz, B. A., PE, Sc.D. ............... New Mexico State

The Department of Civil and 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 web site at http://www.engr.utk.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 3 hours of thesis, is required.

One foreign language if the student’s faculty committee feels that reading knowledge of a foreign language is crucial to the student’s research efforts.
510 Urban Systems: Engineering and Management (3) Various urban systems usually under re-
sponsibility of city manager and/or city engineer: streets, lighting, water, sewers, refuse collection,
Personnel management, finance, planning and public
Prereq: Graduate standing or consent of
521 Pavement Design (3) Empirical and theoretical based methods of pavement design and analysis
strengthening existing pavements, pavement distress and
economical design alternatives. Prereq: 321 and 330.
522 Advanced Mix Design and Analysis for Asphalt
and Portland-Cement Concrete (3) Aggregate prop-
ties and tests, asphalt binder properties and tests,
mix design methods for asphaltic mixes, hot-mix asphalt (HMA) mixture production and capital (HMA)
mixture characterization and analysis, Portland-
cement concrete (PCC) mix design, admixtures for
PCC, special types of PCC, PCC production and
construction. Prerequisite: CE 321.
530 Advanced Soil Mechanics and Slope Stability (3)
Shear stress and stress-strain behavior of sands
and clays. Lab measurement of drained and undrained
soil behavior. Limiting equilibrium methods for evalu-
ating stability of slopes. Lab measurement of hydraulic
conductivity of fine grained soils: clay barri-
ers and caps. Geotechnical considerations in landfall
design. Prereq: Introduction to Soil Behavior.
531 Soil Stabilization (3) Mechanical stabilization of soils
by compaction, drainage, and blending; chemi-
ical stabilization of soils with admixtures, waterproof-
ning and modifying soils and additives. Reinforced
earth and stabilization with geosynthetics. Prereq:
Introduction to Soil Behavior.
532 Rock Mechanics and Rock Engineering (3)
Engineering properties and characterization of rock
and rock masses. Discontinuity analysis, stress and
strain, rockbore theory, computations to rock slopes,
underground excavations, foundations and ground-
water 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 acquisi-
tion and control, insitu measurement of stress, pore
pressure, deformation, load deformation behavior
(seismic methods, static methods), advanced labora-
tory shear strength and compressibility testing. Prereq:
300 Introduction to Soil Behavior. 2 hrs and 1 lab.
534 Geological Engineering (3) Influence of geo-
logical properties on transportation facilities
characterized by 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.
535 Advanced Foundations and Retaining Struc-
tures (3) Site investigation principles, characterizing
soil bearing capacity and settlement of shallow and deep foun-
dations. Stresses from elasticity theory. One-dimen-
sional consolidation. Design of shallow foundations,
piles and drilled piers. Foundations on rock. Earth
pressure theory and design of retaining walls and
537 Issues in Geotechnical Engineering (1-3) Spec-
ial topics including theories, applications, and princi-
ples in geotechnical engineering. Prereq: Graduate
standing or consent of instructor. May be repeated.
538 Finite Element Applications in Geotechnical
Engineering (3) Application of finite element method
in geotechnical engineering. Con-
tinued and unconfined flow through porous media;
two-
dimensional stress and strain; two-dimensional ele-
ments; representation of nonlinear soil behavior with
elastic and elastic-plastic models. Prereq: Introduc-
tion to Soil Behavior and Matrix Computation or eva-
luant. Taught concurrently with CE 537. Students may not receive credit for both 538 and 561.
539 Geotechnology Seminar (1) Seminar topics in
technical and geological engineering. Research
contribution and case histories by graduate students
and engineers and scientists from surrounding com-
munity. Prereq: Graduate standing and consent of
advisor. May not apply toward degree. May be re-
peated. 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 highway, bridges, and construction
projects. Prereq: Construction Methods and Equipment.
543 Construction Estimating (3) Projects cost, esti-
mating and takeoff techniques, market cost condi-
tions, and feasibility studies and program cost. Prereq:
Construction Methods and Equipment.
551 Traffic Engineering-Characteristics (3) Driver-
vehicle-roadway system; traffic flow modeling; ele-
ments of transportation/highway safety. Prereq: Gradu-
ate standing.
552 Traffic Engineering-Operations (3) Signs, sig-
nals and marketing; short-term operations; controllers;
signal timing/phasing; one-way reversible flow; sys-
tem 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 geo-
metric design and urban and rural roads of all classes,
subdivisions without control; urban roads of all classes;
techniques for access control; freeway inter-
changes and street intersections; and parking. Prereq:
451 or consent of instructor.
555 Public Transit Planning (3) Characteristics of transit modes—conventional and paratransit; opera-
tional design of transit services: route planning and
scheduling; cost analysis; mode choice models; per-
tformance evaluation; coordination, planning and
financing. Prereq: 554 or graduate standing.
556 Traffic Accident Reconstruction (3) Data col-
collection and analysis as basis for accident prevention
on control programs; roadside hardware design and grad
testification. Prereq: 452 or graduate standing.
557 Transportation Planning and Operations with
Micro-Computer Applications (3) Transportation sys-
tem management techniques and application of mi-
cro-computers to analysis of transportation actions.
Prereq: 551 and 556.
558 Planning and Transportation (3) Preparation of
transportation as elements of comprehensive devel-
opment plans. Analysis of relationship between vari-
ous transportation modes and between transportation
and other community features. Use of planning pro-
cess to establish existing travel patterns, modeling of
demand, proposing alternatives and evaluation.
Prereq: Graduate standing. Same as Planning 537.
561 Finite Element Applications in Structural Engi-
nering (3) Application of finite element method to
typical problems in structural engineering. Truss,
bearing and plate elements; two-dimensional stress and
strain; two-dimensional elements; representation of
nonlinear material behavior with elastic and elastic-
plastic models. Prereq: Structural Analysis and Ma-
trix Computation or equivalent. Taught concurrently
with CE 538. Students may not receive credit for both
538 and 561.
562 Structural Systems (3) Structural system analy-
sis and design; dead, live, wind, and earthquake loads
on buildings; vertical and horizontal resisting sys-
tems; use of computers in analysis and design. Prereq:
Introduction to Structural Design.
563 Statically Indeterminate Structures (3) Elastic
analysis of indeterminate articlar and rigid frames
with non-prismatic members using energy, slope de-
flection, 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 struc-
tures having many degrees of freedom; elastos
tic behavior of indeterminate frames and rigid frames
considered as frames, 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
loading; relation between research results and current
specifications for design. Prereq: 471.
Environmental Engineering

GRADUATE COURSES

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

508 Seminar (1) Reports on current research in environmental engineering at UT. Prereg: 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 ecossystems. Prereg: Consent of instructor.

520 Open Channel Hydraulics (3) Open channel flow principles, properties, and classifications; uniform and gradually varied flow phenomena; open channel design; unsteady flow theory and analysis: dynamic routing; spatially varied flow; nonlinear movement; microcomputer applications, featuring HEC-2 model. Prereg: Hydraulic.

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 and policies; programs, organizations, regulations, and legal aspects; floodplain hydrology and hydroclimatic. HEC-1, HEC-2: floodway encroachment, flood hazard zone and damage potential determinations: cast studies. Prereg: 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. Prereg: Hydraulic.

525 Soil Erosion and Sediment Yield (3) Theory of soil erosion and sediment yield processes from disturbed land; methods and computer models for estimating sediment yield: erosion control theory and management practices. Local and state regulations. Prereg: Civil Engineering 395. (Same as Biosystems Engineering 525.)

530 Urban Hydrology and Stormwater Engineering (3) Planning, design, modeling, and maintenance of urban stormwater systems. Theory and application of hydrologic and hydraulic principles to design of stormwater management systems: design of inlet structures, conveyance systems, detention/retention basins 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. Prereg: Hydraulics, Hydrology.


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 application in water and waste treatment. Prereg: Water and Waste Treatment, 104 hours and 1 lab. (Same as Biosystems Engineering 552.)

552 Biological Treatment Theory (3) Theory and design applications of biological processes to treatment of wastewater and solid wastes. Prereg: Water and Waste Treatment, 2 hours and 1 lab. (Same as Biosystems Engineering 552.)

553 Aquatic Chemistry (3) Theoretical, applied and analytical chemistry related to generation, measurement and treatment of environmental contaminants. Prereg: General Chemistry. 2 hours and 1 lab.

554 Environmental Engineering Chemistry (3) Application of chemical principles in analyzing physical, chemical, or biological interactions of chemical contaminants in various environmental compartments: atmosphere, hydrosphere, and lithosphere. Prereg: 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, and composting; design of recovery systems: current and future regulations. Prereg: Senior standing.

556 Hazardous Waste Management (3) Analysis and design of operations and processes for hazardous waste disposal and current regulations; industrial applications. Prereg: 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. Prereg: 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. Prereg: 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. Prereg: 570.

572 Air Quality Dispersion Modeling (3) Diffusion in atmosphere; application of atmospheric dispersion models and evaluation of meteorological and air quality data. Prereg: 570.

573 Sampling of Air Pollutants (3) Standard sampling methods for particulate and gaseous air pollutants from industrial processes; ambient air monitoring instrumentation/techniques. Prereg: 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 583.)

590 Special Problems in Environmental Engineering (1-6) Enrollment limited to environmental engineering students in non-thesis program. Prereg: Graduate standing. May be repeated. Maximum 6 hrs. S/N only.

595 Special Topics (1-4) Problems and topics related to current developments in field. May be repeated. Prereg: Consent of instructor.

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

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. Prereg: 435 Foundation Engineering.

651 Analysis Techniques for Transportation Systems I (3) Analysis of trip generation, trip distribution, modal split and traffic assignment, employing mathematical, statistical, and computer science techniques. State of the art and new modeling techniques. Prereg: 554 or 556.

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. Prereg: 651.

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. Prereg: 571.

674 Behavior of Reinforced Concrete Beams and Slabs (3) Strength and behavior of statically indeterminate reinforced concrete beams and frames; limit analysis; behavior, analysis, and design of reinforced concrete slabs; yield-line theory, finite element solutions, and ACI Code Method. Prereg: 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. Prereg: 580, Introduction to Structural Design or consent of instructor.

691 Special Topics in Civil Engineering (3) Selected advanced problems of current interest. Prereg: Consent of instructor. May be repeated.
Communication

Communication Studies

(College of Communication and Information)

MAJORS

Communication .................................. M.S., Ph.D.

SPEAKERS

Communication

MAJORS

Communication .................................. M.S., Ph.D.

SPEAKERS

Communication

MAJORS

Communication .................................. M.S., Ph.D.

SPEAKERS

Communication

MAJORS

Communication .................................. M.S., Ph.D.

SPEAKERS

Communication

MAJORS

Communication .................................. M.S., Ph.D.

SPEAKERS

Communication

MAJORS

Communication .................................. M.S., Ph.D.

SPEAKERS

Communication

MAJORS

Communication .................................. M.S., Ph.D.
other baccalaureate degrees. However, all applicants without the appropriate background are required to take up to 18 semester hours of prerequisite and corequisite courses as determined by the department in which the student is enrolled.

Master’s students who have had no courses in their major area of concentration may expect to spend four or more full-time semesters in the program, including a media internship.

THE MASTER’S PROGRAM

The Master of Science with a major in Communication is intended for students who desire a career in the mass media and communication industry, with an emphasis on communication management and a deeper understanding of the communication process and social role of media. The program concentrations include advertising, electronic media, journalism, science communication, public relations, converging media, and speech communication. Both thesis and non-thesis options are available.

Degree Requirements

The M.S. program emphasizes communication management and industry in the areas of advertising, electronic media, journalism, science communication, public relations, converging media, and speech communication. For the thesis option, a minimum of 30 hours of approved graduate work is required. The non-thesis option requires 33 hours. Orientation attendance is required.

1. Six hours of core courses—Communication 512 and 540 to be taken during the first two semesters of the student’s program, except with written approval of the Associate Dean for Graduate Studies for the College.
2. Fifteen hours within one department of the college, at least 6 hours at the 500 level or above. An internship, if needed, is included.
3. Three hours for the thesis option and 9 hours for the non-thesis option of electives from a list provided by the department in area of concentration.
4. Six hours of thesis work (Communication 500) or a 3-hour project (Communication 590).

Additional hours may be required for those who do not have academic prerequisites, and an internship may be required for those who do not have professional experience in the field they wish to study. A course in communication law is a prerequisite.

A student’s internship experience requires approval by his/her advisor. Credit will be given through 598, Electronic Media 598, Journalism 598, or Public Relations 598 on the basis of 3 hours of credit for the equivalent of 15 weeks of full-time professional experience. This credit is to be included in the hour requirements for the M.S. program. Previous professional experience will be evaluated by the student’s committee. Students interested in subsequent entry into a doctoral program are advised to pursue the thesis option and to take additional courses in communication theory and research, subject to advisor’s approval.

After completion of the formal program of coursework and research for the thesis option, the student must pass an oral examination conducted by his/her graduate committee. The non-thesis option requires a written comprehensive examination and an oral defense of the project.

THE DOCTORAL PROGRAM

The Ph.D. with a major in Communication is intended to prepare scholars for teaching, research, administration, and service in the fields of communication and information. The program is interdisciplinary, consisting of a required core curriculum and recommended courses outside the College in the related social and behavioral sciences. 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. A score on the Graduate Record Examination; and
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—Communication 620, 621, 640, 641, 642; 6 hours of statistics; and three of the following courses: Communication 640, 641, and 642.
2. Fifteen hours in a primary concentration—Communication 622, 623, 642, and 652.
3. Twelve hours in a secondary concentration (out of the College of Communication and Information).
5. Twenty-four hours of dissertation. All courses require the approval of the student’s advisor.

Admission to candidacy must be attained at least one semester 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 Communication and Information. 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 Communication 521, Tutorial in Communication Teaching.

Planned course offerings in the College of Communication and Information for a full calendar year are available the preceding November. This information is available from the Graduate Studies Office, 420 Communications Building, 974-6651. See also courses listed under Advertising/Public Relations, Journalism/Electronic Media, Information Sciences, and Speech Communication.

ACADEMIC STANDARDS

A student in the College of Communication and Information whose graduate grade-point average, not including incomplete grades, is below 3.0 at any time after the end of 12 hours of graduate credit will be placed on probation. A student on probation will be dropped from the program unless his or her cumulative grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 semester hours of graduate coursework attempted that is specified in the student’s degree program. Exceptions to this policy may be made only with the approval of the Associate Dean for Graduate Studies of the College of Communication and Information on the recommendation of the student’s faculty committee.

GRADUATE COURSES

400 Mass Communication Law and Ethics (3) Legal issues directly affecting the mass media: libel, privacy, free press-fair trial, judicial controls, governmental regulations. Ethical standards and practices of mass media in America. Prereq: News Writing or Advertising Creative Strategy or Radio-TV News, Advertising and Promotion or History of Rhetorical Theory or consent of instructor. (Same as Legal Studies 400).

500 Thesis (1-15) P/NP 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.

512 Mass Media Research Methods (3) Applications of communication research techniques for management. Gathering and analysis of data for assessing media audiences and message impacts. Prereq: Consent of instructor or admission to program.

521 Tutorial in Communication Teaching (1) Experience as teacher under guidance of faculty member. Prereq: Consent of instructor. S/NC only.

540 Communication Theory (3) Selected research hypotheses and theories in literature of mass communication. Prereq: Consent of instructor or admission to program.

550 Seminar in Media Economics and New Technology (3) Electronic and print media ownership, finance and corporate structure. Roles of new technologies in marketing techniques changing media content and function in future. Prereq: Consent of instructor or admission to program.

551 Seminar in Science, Society, and the Mass Media (3) Investigation of interfacing between scientific community and mass media; how scientific information reaches public and impact of journalism on scientific practice. Prereq: 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
Loffez, C., M.D., Medical Biology
Moore, E. E. (Division), Ph.D., Veterinary Teaching Hospital

The Comparative and Experimental Medicine degree program (M.S. and Ph.D.) is a jointly-administered graduate program intended to prepare students for teaching and/or research careers in the health sciences. This program emphasizes the comparative approach to the study of experimental pathobiology, infectious diseases, pharmacokinetics, epidemiology, clinical medicine, immunopathology, hematology, aberrant metabolism, oncology, and genetic disorders. The Ph.D. program is open to approved graduate students seeking training in this area and is especially useful for individuals with professional degrees. For the student with undergraduate biological science background, the Comparative and Experimental Medicine program provides an unusual opportunity to study disease processes common in humans and animals from a multidisciplinary perspective. The scope of this intercollegiate program, which involves faculty 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 web site at http://www.vet.utk.edu/graduate.

ADMISSION REQUIREMENTS

Admission requirements of the Graduate Council of UT apply. In addition, all applicants must include at least one member from 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, 5 or more hours of electives, and 6 hours of Theses 500. Exceptions to accommodate students with specific interests must be approved by the Joint Graduate Coordinating Committee after application, in writing, to the director.

The graduate committee (at least 3 members) is chosen after the first term and must include at least one member from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. If a minor is declared, one member must be from the minor discipline.

A final oral examination is given at the end of the program.

THE DOCTORAL PROGRAM

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 doctoral committee. For the basic science concentration, students must take at least 4 credit hours 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 no 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.
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 800-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 600 are required for a total of 48 hours. For students with professional degrees, a minimum of 18 hours of coursework beyond the professional degree is required for a total of 42 hours. The doctoral committee (at least 4 members) is chosen during the first year. Three of the four members, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. A comprehensive examination is given at the completion of coursework. A seminar and final oral defense of the dissertation culminate the program.

Comparative and Experimental Medicine—Veterinary Medicine

GRADUATE COURSES

Participating departments include: Animal Science, Comparative Medicine, Microbiology, Pathology, Large Animal Clinical Sciences and Small Animal Clinical Sciences. Several faculty in the Department of Microbiology hold joint appointments in the College of Veterinary Medicine. See Microbiology under Fields of Instruction for additional courses.

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

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.

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.

508 Graduate Research Participation (3) Advanced research techniques while conducting individual biomedically relevant research projects under supervision of faculty. Open to all graduate students. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 9 hrs. S/NC only.

521 Principles of Oncology (3) Lectures, classroom discussion, and case reports surveying major topics of oncology. Prereq: Biology 220-30 or consent of instructor.

541 Molecular Basis for Human Diseases (4) Disease at molecular level. Changes in molecular events in cells that lead to disease and occur as result of disease. Correlation with clinical and pathological states. Prereq: Biochemistry and Cellular and Molecular Biology 410-419 or equivalent.

545 Clinical Genetics (3) Human genetic disorders: new developments in cytogenetics, molecular genetics, clinical diagnoses and prevention. Prereq: Biology and genetics background or consent of instructor.

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

610 Medical Biology Seminar (1) Invited speakers. Topics posted in advance. May be repeated. S/NC only.

611 Advanced Topics in Medical Science (1-3) New developments in biological research applicable to clinical medicine. Primarily for doctoral candidates in Comparative and Experimental Medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.


602 Surgical Pathology (1-2) Examination of biopsy specimens and interpretation of observations. Preparation of specimens for sectioning. Prereq: Consent of instructor. May be repeated. Maximum 3 hrs.

603 Correlative Post-Mortem Pathology (1-3) Gross and microscopic post-mortem examination of animals. Correlative interpretation of clinical diseases and lesions. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

604 Veterinary Pathology Seminar (1) Microscopic slides and transparencies of lesions from cases examined by pathologists, residents, and graduate students. Interpretation of observations. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs.

605 Pathobiology Seminar (1) Subjects of current interest in biomedical science. Students present one seminar per term enrolled. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. Class meets once monthly.

606 Clinical Epidemiology (3) Theory and principles of design implementation and analysis of clinical research. Lab: appraisal of biomedical literature and design of proposal for clinical research project. Prereq: Consent of instructor.

607 Diagnosis and Pathogenesis of Virus Diseases of Domestic Animals (3) Advanced study of virus diseases important to domestic animals: virus biology, pathogenesis, pathology and diagnosis, technical training in virus diseases diagnosis. Prereq: Consent of instructor. 2 hrs and 1 lab.

608 Descriptive and Applied Epidemiology (3) Principles of epidemiology and historic and modern application to diseases of animals. Host-agent relationships, measurement of disease frequency, animal production and disease monitoring and control, field investigations, animal health economics. Prereq: Consent of instructor.

609 Mechanisms of Disease (4) Advanced topics in pathobiology and mechanisms of disease: pathophysi-ology, cellular degeneration, inflammation, immunopathology, hemostasis. Principal biochemical and morphologic responses of various cells, tissues, and organs to injury and other metabolic derangements. Selected contemporary topics from current literature and textbooks. Prereq: Consent of instructor.

610 Advanced Topics in Comparative and Experimental Medicine (1-3) Specialized in-depth experience in various disciplines. Current and future research methodology, recent advanced in instrumentation and analytical techniques for comparative medicine. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

651 Advanced Topics in Animal Anatomy (1-4) (Same as Animal Science 651.)

652 Disorders of the Endocrine System (2) (Same as Animal Science 652.)

Comparative Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine.

Computer Science

(College of Arts and Sciences)

MAJOR DEGREES

Computer Science .................... M.S., Ph.D.

Jesse H. Poore, Interim Head

Professors:

Donghai Jack, Ph.D. ................. New Mexico

Langman, Michael A., Ph.D. ......... Texas A&M

Poore, Jesse H., Ph.D. ............ Georgia Tech
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 in systems programming are required for admission. For the master’s degree, 30 semester hours of graduate credit are required, 24 of which must be 500 level or above. Computer Science 530, 560 and 580 are required for the degree. Graduate courses taken outside the department are sometimes allowed but must be approved by the Graduate Committee before enrollment.

Thomason, Michael G., Ph.D. ..........Duke
Vander Zanden, Bradley, Ph.D. ..........Cornell
Ward, Robert C., Ph.D. .............. Virginia

Associate Professors:
Beck, Micah, Ph.D. .......................... Cornell
Gregor, Jens, Ph.D. .......................... Aalborg (Denmark)
MacLennan, Bruce J., Ph.D. ........... Purdue
Parker, Lynne, Ph.D. ........................ Massachusetts Institute of Technology
Plank, James S., Ph.D. .................... Princeton
Vose, Michael D., Ph.D. ................... Texas

Huang, Jian, Ph.D. ...............................Ohio
Straight, David W., Ph.D. .................. Texas

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 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 those 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.

Graduate courses taken must be at the 600 level or above. 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.

471 Numerical Analysis (3) (Same as Mathematics 471.)

472 Numerical Algebra (3) (Same as Mathematics 472.)

480 Advanced Topics in Theoretical Computer Science (3) Theory of computation, complexity theory, formal languages and graph theory and its applications. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

494 Special Topics in Computer Science (1-3) May be repeated. Maximum 9 hrs.

500 Thesis (1-15) P/NP 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.

522 Cybernetics (3) Various functions in living systems and their actual or potential realization in computers. Prereq: Discrete Structures.

525 Software Engineering (3) Survey of key ideas in software engineering; formal methods, tools, testing, reliability, structured design and development, metrics, management and history of the field.

530 Computer Systems Organization (3) Architectures and systems organization for serial and parallel machines. Required background: Architecture or machine organization.


551 Pattern Analysis (3) Decision-theoretic and structural pattern analysis. Deterministic and statistical decision rules, feature extraction and representation; syntactic and semantic methods, relational models. Prereq: Discrete Structures and probability or statistics.

552 Image Analysis (3) Enhancement and restoration of digital images, 2D transforms, Segmentation and description. Computational procedures for image reconstruction. Prereq: One year calculus and discrete structures.

560 Software Systems (3) Design and implementation of compilers, software systems; optimization, run-time storage administration. Software system design issues; description, structure and design of contemporary software systems. Prereq: Systems Programming.

571-72 Numerical Mathematics (3) (Same as Mathematics 571-72.)

573 Finite Difference Methods for Partial Differential Equations (3) (Same as Mathematics 573.)

574 Finite Element Methods (3) (Same as Mathematics 574.)

575 Matrix Theory and Techniques in Numerical Analysis (3) (Same as Mathematics 575.)

576 Sparse Matrix Computations (3) Solution of large sparse linear systems: graph models, reordering techniques, symbolic factorizations, data structures, numerical algorithms, complexity analyses, parallel algorithms. Prereq: Numerical linear algebra.

580 Foundations (3) Foundations of computer science, including computability, computational complexity, fundamental algorithms and algorithm analysis. Required background: Automata theory.

581 Advanced Design and Analysis of Algorithms (3) Analysis of algorithms and relevance of analysis to design of efficient computer algorithms. Sorting, searching, graph algorithms, pattern matching, dynamic programming, efficient approximation algorithms. Prereq: 580.

593 Independent Study (1-15) May be repeated. May be for credit or for non-credit.

594 Special Topics in Computer Science (1-3) May be repeated.

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

620 Advanced Topics in Intelligent Systems (1-6) Prereq: Consent of instructor. May be repeated with consent of department.
Consumer Services Management

(College of Education, Health, and Human Sciences)

MAJORS DEGREES

Consumer Services Management .............. M.S.
Human Ecology .................................. Ph.D.

Nancy B. Fair, Head

Professors:
Costello, Carol, Ph.D. (Liaison) ....... Tennessee
Fair, Nancy B., Ph.D. ..................... NC State
Fairhurst, Ann E., Ph.D. ............... Oklahoma State
Jolly, Laura, Ph.D. ....................... Oklahoma State

Associate Professors:
Wise, Dena, Ph.D. ......................... Texas A&M

Assistant Professors:
Chen, Rachel, Ph.D., NC State
Pfaffenberg, Carl, Ph.D. ................... Tennessee
Salazar, John, Ph.D. ...................... Auburn
Young, Allison, Ph.D. ................. Minnesota

The Department of Consumer Services Management offers graduate programs leading to degrees, majors, and concentrations in:

Master of Science
Consumer Services Management
Retail and Consumer Sciences
Hospitality and Tourism Management

Doctor of Philosophy
Human Ecology
Retail and Consumer Sciences
Hospitality and Tourism Management

Certificate Programs
Services Management
Tourism Development

The Department of Consumer Services Management offers the master’s degree with a major in Consumer Services Management and concentrations in hospitality and tourism management and retail and consumer sciences.

The programs in Consumer Services Management prepare students for careers in industry and business, public and private agencies, and educational institutions. Master’s level work develops students’ technical skills in retail management, merchandising, hospitality management, tourism, and related consumer services. The advanced work undertaken for the doctoral degree focuses on building and applying research skills to advance the fields of retail and consumer sciences and hospitality and tourism.

Interested students should contact the department for more information or visit the department link on the college web site: http://www.cehhs.utk.edu/departments.html.

Admission Requirements

A complete file for review includes the Graduate Application for Admission file, Department of Consumer 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.

In addition to specified entrance requirements stipulated by the Graduate Council, admission to the master’s degree program with a major in Consumer Services Management 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 sciences, students should have an adequate background in retailing and/or consumer science supported by coursework in marketing and statistics. For the concentration in hospitality and tourism management, students should have an adequate background in hotel and/or restaurant management and/or tourism management supported by coursework in food production, cost control, or lodging management.

Superior students deficient in one or more of the above requirements, may be admitted at the discretion of the department’s graduate faculty. Deficiencies may need to be addressed through undergraduate coursework.

THE MASTER’S PROGRAM

The requirements for the major in Consumer Services Management are listed below by concentration.

Retail and Consumer Sciences (Thesis)

Services Management:
Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 510, 532
Research Methods:
Retail and Consumer Sciences 562
Statistical Methods
Cognate Area
RSC Elective
Thesis
TOTAL

Retail and Consumer Sciences (Non-Thesis)

Services Management:
Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 510, 532
Research Methods:
Retail and Consumer Sciences 562
Statistical Methods
Cognate Area
RSC Electives
Professional Paper/Project: RCS 501
TOTAL

Hospitality and Tourism Management (Thesis)

Services Management:
Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 510, 532
Tourism:
Select either HRA 523 or 524
Research Methods:
Retail and Consumer Sciences 562
Statistical Methods
Cognate Area
HRA 547, Field Experience
Thesis
TOTAL

Hospitality and Tourism Management (Non-Thesis)

Services Management:
Retail and Consumer Sciences 541, 538, Hotel and Restaurant Administration 510, 532
Tourism:
Select from HRA 523, Tourism Analysis; 423, Marketing for Hospitality and Tourism; 435, Conventions and Meetings; Pursuit and Attainment; 524, Tourism Destination Development
Research Methods:
Retail and Consumer Sciences 562
Statistical Methods
Cognate Area
HRA 547, Field Experience
Professional Paper/Project: RCS 501
TOTAL

THE PH.D. CONCENTRATIONS

The requirements for the doctoral degree are listed below by concentration.

Retail and Consumer Sciences

RCS Required Courses: RCS 614, 615, 625, 641
Research Methods: RCS 590, 616
Statistics:
Stat 537, 538, 579, elective
Cognate Area
Instructional Methods
Electives
Dissertation
TOTAL

Hospitality and Tourism Management

HRA Required Courses: HRA 614, 615, 547, 523, 524
Research Methods: HRA 537, RCS 616
Statistics:
Stat 537, 538, 579
Cognate Area
Instructional Methods
Electives
Dissertation
TOTAL

1Cognate hours must include at least 3 hours at the 600 level.
2Graduate level courses that will help develop students’ instructional capabilities.

1Cognate hours must include at least 3 hours at the 600 level.
2Graduate level courses that will help develop students’ instructional capabilities.
CERTIFICATE IN SERVICES MANAGEMENT

Recreation and Leisure Studies 510.

The Department of Consumer 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 510, 532.

CERTIFICATE IN TOURISM DEVELOPMENT

The Department of Consumer Services Management offers a certificate program in tourism development for students seeking continuing education and career advancement opportunities related to tourism in public and private sectors. The 12-credit hour certificate is available by completing the following courses: HRA 523, Tourism Analysis, HRA 524, Tourism Destination Development, HRA 435, Conventions and Meetings: Pursuit and Attainment, HRA 423, Marketing for Tourism and Hospitality.

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.

Hotel and Restaurant Administration

GRADUATE COURSES

423 Marketing for Hospitality and Tourism (3) Marketing principles and practices specifically applied to the hospitality and tourism industry. Includes the analyses of various hospitality and tourism marketing strategies and the implications of those strategies. Develops the use of marketing tools as an integral part of the hospitality and tourism operation.
435 Conventions and Meetings: Pursuit and Attainment (3) Discussion of types of conventions/meetings, roles of meeting planners, identifying decision makers, site selection, negotiating, budgeting, marketing and gaining commitment from group. Prereq: HRA 210, 211, 390 or consent of instructor.
500 Thesis (1-15) P/NP 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.
510 Trends and Issues in Services Management (3) Examination of current and emerging trends and issues in the consumer product and services industry. Implications of trends and their managerial and strategic applications in services management. (Same as Recreation and Leisure Studies 510.)
523 Tourism Analysis (3) Trade theory and regional analysis methodologies applied to tourism and the service industry, including travel balance account, interregional transactions, flow of income and its impact on the environment, economic demand, demand theory and forecasting.
524 Tourism Destination Development (3) Relationship of economic theory and planning principles to tourism development. Includes the application of prefeasibility analysis to tourism projects and the evaluation of various types of tourism and components of tourism.
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.
534 Special Topics in Foodservice and Lodging Administration (1-3) Lecture discussion format. Contemporary developments and trends in industry. Prereq: Consent of instructor. May be repeated.
535 Directed Study in Foodservice and Lodging Administration (1-3) Problems selected for study under guidance of faculty member. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.
537 Seminar in Foodservice and Lodging Administration (1) May be repeated. S/NC only.
542 Advanced Hotel Administration (3) Strategic management of hotel organizations. Theoretical application of 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.
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.
600 Doctoral Research and Dissertation (3-15) P/NP only.

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 a 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 consumer 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 consumer decision-making process to communicate in-store promotions. Prereq: 376 Strategies for Growth.
500 Thesis (1-15) P/NP only.
501 Professional Project (3-6) Application-oriented, capstone project to show competence in major academic area. Enrollment limited to retail and consumer sciences students in non-thesis program. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.
502 Registration for Use of Facilities (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 Retail Strategy and Decision Making (3) Strategy, strategic management and strategic process in retail sector. Analytical decision-making skills in retail. 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/services strategies based upon consumer behavior knowledge. Investigations of qualitative and quantitative methodologies to conduct elementary consumer behavior research.
562 Research Methods (3) Fundamentals of science method, advancement of science methodology and method of research. Issues and concepts of basic and applied research. Prereq: Statistics 531 or equivalent.
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, small business management, issues in retail management, issues in retail strategy, quality perception by consumers, product and service value, retailing to children, retailing and special populations, special research methods. Prereq: 9 hrs graduate coursework. May be repeated. Maximum 9 hrs.
600 Dissertation (3-15) P/NP only.
614 Theory in Retail Environment (3) Analysis and evaluation of theory in retail environment and its application to research in retailing. Prereq: 562 or equivalent.
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 or equivalent.
616 Research Methods, Models and Measurement in Retail and Consumer Sciences (3) Quantitative and qualitative methods and analytical concepts in the research process. Formulation of models and measurement of consumer sciences constructs. Prereq: 562, Statistics 538 or equivalent.
625 Strategic Managerial Retailing (3) Decision-making orientation that integrates strategic thinking with components of preparation and analysis of specific retail case situations. Prereq: 510 or equivalent.
641 Retail Consumer Behavior (3) Theories and concepts from social science in relation to ultimate consumer’s behavior. Prereq: 541 or equivalent.
695 Advanced Topics in Retail and Consumer Sciences (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance to retail and consumer sciences. Prereq: 21 graduate hours in consumer sciences. May be repeated. Maximum 9 hrs.

Consumer Services Management
Earth and Planetary Sciences

(College of Arts and Sciences)

MAJOR DEGREES

Geology .............................. M.S., Ph.D.
Claudia I. Mora, Acting Head

Professors:
Broadhead, Thomas W., Ph.D........ Iowa
Driese, Steven G. (Liaison), Ph.D. .... Wisconsin
Dunne, William M., Ph.D. .............. Bristol
Hatcher, Robert D., Jr. (Distinguished Scientist), Ph.D. .......... Tennessee
Labotka, Theodore C., Ph.D. .......... Caltech
McKinney, Michael L., Ph.D. .......... Yale
McSween, Harry Y. (Distinguished Professor), Ph.D. ............... Harvard
Misra, Kula C., Ph.D. ................. Western Ontario
Mora, Claudia I. (Carden Professor), Ph.D. ............................ Wisconsin
Taylor, Lawrence A., Ph.D. ............ Lehigh

Associate Professors:
Clark, G. Michael, Ph.D. .............. Penn State
McKay, Larry D. (Jones Professor), Ph.D. ....... Waterloo
Williams, Richard T. II., Ph.D. .... Virginia Tech

Assistant Professors:
Kah, Linda C., Ph.D. .................... Harvard
Perfect, Edmund, Ph.D. ............... Cornell
Uhle, Maria (Jones Professor), Ph.D. ................................. Virginia

The Department of Earth and Planetary Sciences offers both the M.S. and Ph.D. degrees in Geology. Persons interested in these programs should contact the Director of Graduate Admissions in the department.

For admission, an applicant must provide transcripts of previous university work, two rating forms or letters of recommendation, and GRE scores (general). Students are not normally admitted under non-degree status.

Prerequisite for both degrees is a bachelor’s degree, including coursework in mineralogy, optical mineralogy, petrology, stratigraphy, paleontology, structural geology, and field geology. One year of coursework in calculus and chemistry and one year of coursework in biology, physics, or statistics are also required. Applicants lacking any of these may be admitted, but the deficiencies must be removed within the first year without graduate credit. Substitutions may also be allowed.

THE MASTER’S PROGRAM

The department offers the thesis option in the master’s program. Graduation requires successful oral defense of a written thesis and a minimum 3.0 GPA in all graduate coursework.

Course requirements are a minimum of 30 semester hours, including:
1. Six hours of Thesis 500.
2. Registration in 595 during the first two years in residence. Two hours may be counted toward the 30-hour minimum. This requirement may be waived in unusual circumstances.
3. Sixteen hours of geology courses, with at least 14 hours at the 500 or 600 level, including at least one course from any three of the following five groups:
   Group 1: 410, 460, 475, 480, 530, 563, 565, 568.
   Group 5: Any 400- or 500-level courses with graduate credit from related departments (e.g., sciences, mathematics, and engineering), selected with approval of the advisor.
4. Eight hours of additional graduate coursework.

THE DOCTORAL PROGRAM

The prerequisite for the Ph.D. program, in addition to that for the M.S. program, is either a master’s degree in Geology, or a bachelor’s degree plus completion of 24 hours of graded coursework with at least one course from any three of the groups listed in #3 above. These courses may be taken while completing other course requirements.

Graduation requires passing a comprehensive examination, taken no later than the end of the second year, completion of all course requirements with a minimum 3.0 GPA, completion of the language requirement, and successful oral defense of the dissertation.

The comprehensive examination includes both written and oral parts in which the candidate will be tested on his/her knowledge of the area concerning the proposed dissertation and of related fields. The candidate is expected to be conversant in a wide field of geological sciences.

A minimum of 24 hours of 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.

Geology

GRADUATE COURSES

401 Quantitative Methods in Geology (3) Application of calculus and statistics to problems in earth sciences. Examples of diffusion equations in hydrogeology, wave equation in geophysics, mechanical modeling and boundary conditions in structural geology and tectonics. Prereq: The Dynamic Earth or Earth, Life, and Time, 2 semesters of Calculus.


411 Optical Mineralogy (2) Laboratory course on principles of optical mineralogy. Use of petrographic microscope to identify rock-forming minerals with applications to petrology and environmental mineralogy. Prereq: Mineralogy.

412 Elements of X-ray Diffraction (2) Laboratory course on principles and applications of X-ray diffraction. Phase identification, quantitative determination of mineral abundances in mixtures, and crystal structure determination. Prereq: Mineralogy.

420 Paleocology (4) Principles of paleoecological analysis as applied to fossils and fossil assemblages: data collection and interpretation. Laboratory design and construction. Study of field guidebooks and 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. Prereq: Paleobiology or consent of instructor. 2 hrs and 2 2-hr labs.

440 Field Geology (5) Summer field course for advanced undergraduate and first-year graduate students in geology. Taught off-campus and requires full time of student. Synthesis of major aspects of geological sciences, development of field techniques demonstrated, practiced, and applied to solution of geologic problems. Prereq: 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. Prereq: 101-02. (Same as Geography 450). 2 hrs and 1 2-hr lab.

455 Basic Environmental Geology (3) Applications of geological sciences toward comprehension of the effects of geological processes on humans and the effects of human activities on earth’s environments. Prereq: The Dynamic Earth, 2 hrs in the field 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. Prereq: Chemistry 120-130 General Chemistry, Mathematics 141-142 Calculus I, II. Recommended prereq: Geology 330 Igneous and Metamorphic Petrology or consent of instructor. 3 hrs and 1 2-hr tutorial.


475 Physical and Chemical Systems of the Earth (4) Development of physical earth from solar nebula to present. Formation, composition and evolution of hydrosphere, crust, mantle, and core. Interdependence of earthquakes, 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. Prereq: 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 metallogenesis. Prereq: 310 and 330 or equivalents. Recommended prereq: 460. 1 hrs and 1 2-hr lab.

485 Principles of Hydrogeology (3) Physical principles of flow and transport of water in the subsurface. Water catchment systems, ground water, and surface water. Prereq: The Dynamic Earth, Calculus: Fundamentals of Physics or equivalent, 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 (.5-15) P/NP 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.

505 Structure of the Southern and Central Appalachians (2) Structural development of Southern and Central Appalachians from extensional Late Proterozoic—early Paleozoic rift-drift-platform processes through processes related to compressional events producing orogenic elements that formed Appalachians throughout the Paleozoic. Comparisons to similar orogens. Prereq: Structural Geology.

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 subsolidus 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 fossil soils (paleosols) 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. Stratiography and Sedimentation or equivalent, general chemistry, or consent of instructor.

545 Sandstone Petrology/Physical Sedimentology (4) Field and microscopic analysis of terrigenous clastic rock types; physical processes of sedimentation, transport of sediment, and formation of sedimentary structures. Prereq: 340 or equivalent. 3 hrs and 1 lab.

546 Carbonate Sedimentology (4) Environments of deposition of modern and ancient carbonate sediments and resultant rocks; field and laboratory analysis of sample material and preparation of scientific reports. 3 hrs and 1 lab.

550 Regional Geomorphology (3) Integrative approach to study of natural geomorphological regions stressing the interrelationship of landforms, their formation and development; processes through which natural landscapes are altered and modified. Prereq: 310 or consent of instructor. Maximum 9 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.)

560 Stable Isotope Geochemistry (3) Theoretical aspects of isotope fractionation and applications to geological 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 spectrophotometry 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 continental margins through comparative anatomy of mountain belts, including Appalachians, Alps, Urals, Caledonians, Cordillera Andes, and Himalayas. Prereq: Structural Geology or consent of instructor. 3 hrs and 1 seminar.

576 Reflection Seismology (3) Imaging subsurface features using reflected seismic waves. Energy sources, modes of wave propagation, field procedures, computer data processing, and pitfalls. Applications to tectonic and environmental problems. Prereq: 470 or consent of instructor.

585 Contaminant Hydrogeology (3) Physical transport processes, isotopes and groundwater age dating, processes influencing inorganic, organic and microbial contaminants, sampling and monitoring methods, remediation of contaminated groundwater, aquifer protection. Prereq: 485 or 535; 460; or 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 553; and consent of instructor.

590 Special Problems in Geology (1-3) Directed study or special topics. Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.

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

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

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

595 Selected Topics in Geology (1) Presentation of research by faculty and visiting scientists. Registration required for 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 during residence for each graduate student.

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

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.
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 may be accepted if the balance of their course 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 1850. 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 the 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, Tennessee 37996-1610.

THE MASTER’S PROGRAMS

In addition to general requirements of the Graduate Council, aspirants for the Master of Science degree are required to: (1) during the first semester in residence, take a prescriptive diagnostic examination covering major concepts in ecology and evolutionary biology. The examination may be taken twice and must be passed before the student is admitted to candidacy; (2) complete course requirements as determined by the department and the student’s faculty thesis research committee; and (3) satisfactorily complete and defend a research thesis.

THE DOCTORAL PROGRAMS

In addition to general requirements of the Graduate 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: Introductory 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 subsystems: upwellings, polar oceans, hydrothermal vents, gyres, coral reefs, estuaries, and coastal regions. Field trip to coastal required. Prereq: General Biology and General Chemistry; General Ecology recommended.

450 Comparative Animal Behavior (3) Principles and methods of ethology, concentrated in time and subject matter. Historical development of ideas concerning biological evolution. Prereq: Biology 240 General Genetics or consent of instructor. 3 hrs. lecture and 2 hrs. lab/discussion.

459 Comparative Animal Behavior Laboratory (3) Introduction to observational and experimental research in ethology. Coreq: 450. (Same as Psychology 459.)


470 Aquatic Ecology (3) Introduction to the physicochemical nature of inland waters with descrip-

474 Ichthyology (4) Evolution, classification, collection and identification of fish and aquatic biological freshwater fauna of Eastern North America. Prereq: General Ecology or consent of instructor. 2 hrs and 1 lab.

484 Conservation Biology (3) Application of principles and techniques of ecological research to con-

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

502 Registration for Use of Facilities (1-15) Re-

503 Ecology and Evolutionary Biology Seminar (1) Advanced topics in ecology, behavior, and evolution-

504 Special Topics (1-3) Selected directed readings or special course in topics of current interest. Consult departmental listing for offerings. May be repeated with consent of instructor. Maximum 3 hrs. S/NC only.

506 Introductory Seminar (1) Orientation to 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 Biol-

514 Foundations: Readings in Mathematical and Computational Ecology (1) Readings and discussion of classic papers in field.

515 Foundations: Readings in Environmental Toxi-

516 Colloquium in Ethology (1) (Same as Psychol-

520 Ecology for Planners and Engineers (3) Ecologi-

524 Physiological Ecology of Animals (3) Adaptive physiological response of animals to natural changes in or extremes of physical and biotic environment. Terrestrial vertebrates. Prereq: Undergraduate courses in animal physiology and ecology, Biochem-

535 Ecology and Development in the Amazon (3) Natural history, ecosystem diversity and function, and opportunities for sustainable economic 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 level of 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 in ethology, stressing evolution, genetics, physi-

546 Ethological Psychology (3) (Same as Psychol-

468 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.

470 Aquatic Ecology (3) Introduction to the physicochemical nature of inland waters with descrip-

474 Ichthyology (4) Evolution, classification, collection and identification of fish and aquatic biological freshwater fauna of Eastern North America. Prereq: General Ecology or consent of instructor. 2 hrs and 1 lab.

484 Conservation Biology (3) Application of principles and techniques of ecological research to con-

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

502 Registration for Use of Facilities (1-15) Re-

503 Ecology and Evolutionary Biology Seminar (1) Advanced topics in ecology, behavior, and evolution-

504 Special Topics (1-3) Selected directed readings or special course in topics of current interest. Consult departmental listing for offerings. May be repeated with consent of instructor. Maximum 3 hrs. S/NC only.

506 Introductory Seminar (1) Orientation to 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 Biol-

514 Foundations: Readings in Mathematical and Computational Ecology (1) Readings and discussion of classic papers in field.

515 Foundations: Readings in Environmental Toxi-

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535 Ecology and Development in the Amazon (3) Natural history, ecosystem diversity and function, and opportunities for sustainable economic 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 level of 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 in ethology, stressing evolution, genetics, physi-

546 Ethological Psychology (3) (Same as Psychol-
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 ComputationalEcology (1-3)
Exposure and in-depth training in contemporary topics and approaches important to advanced research in mathematical, 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.

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 equivalency. (Same as Botany 612.)

681-682 Advanced Mathematical Ecology (3,3)
(Same as Mathematics 681-682.)
1. Students are required to complete the following core requirements:
   a. Economic Theory: Microeconomic theory and macroeconomic theory by a qualifying exam taken not later than the beginning of the fourth semester of study.
   b. History of Economics: Completion of 515 with a grade of B or better, or, by qualifying examination.
   c. Quantitative Methods: Completion of 581, 582 and 583 with grades of B or better, or by qualifying examination. 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.

MINOR IN ENVIRONMENTAL POLICY

The program is designed to give master's and doctoral level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. While administered through the Economics Department, the program is coordinated by a committee of representatives from the following participating departments and programs: Agricultural Economics and Rural Sociology; Botany; Civil and Environmental Engineering; Ecology and Evolutionary Biology; Economics; Forestry, Wildlife and Fisheries; Geography; Management; Planning; Political Science; and Sociology.

Students may request admission to the minor following admission to a graduate program in one of the participating departments. Students in good standing in one of these programs may apply for admission to the minor in environmental policy. The coordinating committee will consider the admission of interested students. Applicants should have a background in both natural and social sciences evidenced by prior coursework or experience. One course in environmental 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 are 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.

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, and role of monetary and fiscal policies in aggregate economy. Major writing requirement. Prereq: Intermediate Macroeconomics with B or better. May be repeated.
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. May be repeated.
471 Public Finance: Optimal Government Functions and Expenditure Analysis (3) Problems of collective consumption, external effects, public investment, social choice, and decision making. Major writing requirement. Prereq: 201. May be repeated.
472 Public Finance: Taxation and Intergovernmental Relations (3) Analysis of individual and corporate income, federal, state, and local taxation. Major writing requirement. Prereq: 201. May be repeated.
482 Introduction to Mathematical Economics (3) Application of basic mathematical tools: calculus, matrix algebra, etc. to major topics of economic theory. Prereq: Intermediate Microeconomics with B or better and Calculus.
500 Thesis (1-15) P/NP 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.
511-12 Microeconomic Theory (3,3) Theory of consumer choice and demand, theory of revealed preference, attributes of goods and implicit prices, market determination, labor supply and demand, income and price determination, theory of firm, theory of production and cost, market structures, derived demand and factor pricing, introduction to welfare economics, market failure and theory of second best, pure exchange.
513-514 Macroeconomic Theory (3,3) Dynamic general equilibrium models, endogenous growth theory, credibility of monetary policy, budget deficits and fiscal policy, consumption, investment, asset pricing, overlapping generations models, real business cycle, search theory, and open-economy macro models.
515 History of Economics (3) Purpose and methods of history of economics. Background for and origins, concerns, methods, development and conclusions of classical political economy; From Adam Smith through J.S. Mill and K. Marx. Prerequisites: neoclassicism: J.Dupuit and H.H. Gossen.
537 Managing in a Regulated Economy (3) Economic effects 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.
600 Doctoral Research and Dissertation (3-15) P/NP only.
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.
622 International Finance (3) Analysis of macroeconomic adjustment in open economies, with attention to foreign exchange markets, balance of payments, international policy coordination, integration of world capital markets, international monetary arrangements and the international monetary system. Prereq: 512 and 514.
623 Economic Development: Theories and Policies (3) Principal theories explaining economic behavior in developing countries and policies and strategies used to promote development. Prereq: Undergraduate degree in economics or consent of instructor.
624 Economic Development: Western Impact on Asia and Africa (3) Studies of consequences of contact between developed world and developing countries of Asia and Africa. Prereq: 21 hrs of upper division undergraduate social science or consent of instructor.
631 Industrial Organization (3) Standard models of imperfect competition, oligopoly, and asymmetric information. Topics include pricing with market power and strategic decision making. Prereq: Consent of instructor.
632 Industrial Organization II (3) Economics of regulation and antitrust. Topics include public utility regulation, consumer product regulation, occupational safety regulation, environmental regulations and anti-trust legislation. Prereq: Consent of instructor.
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 policy and theory, and student participation. Prereq: 651.
661 Regional and Urban Location and Development Theory (3) Theory of industrial and agricultural location and human migration. Economic basis for land-use patterns, central places, and urban form. Spatial inequalities and urban problems. National policies for regional and urban assistance.
662 Methods of Regional and Urban Analysis (3) Theory of regional/urban economic structure and growth. Regional income and product accounts, shift and share analysis, economic base studies, and regional 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.
Education (College of Education, Health, and Human Sciences)

MAJOR DEGREES

Education ........................................ Ph.D.

The College of Education, Health, and Human Sciences offers the Ph.D. in Education with concentrations and specializations (see parentheses) in the following:

- Counselor Education (Career Development; Rehabilitation; Group Process)
- Cultural Studies of Educational Foundations
- Curriculum, Educational Research, and Evaluation (Curriculum, Educational Research, and Evaluation; Educational Application of Technology)
- Early Childhood Education (Early Childhood Special Education)
- Educational Administration and Policy Studies (Educational Administration and Policy; Higher Education Administration)
- Educational Psychology (Adult Education; Applied Educational Psychology)
- Exercise Science (Biomechanics/Sport Medicine; Exercise Physiology; Physical Activity and Population Health)
- Instructional Technology
- Literacy, Language, and ESL Education (Literacy; Language Education; ESL Education)
- School Psychology
- Sport Studies
- Teacher Education (Literacy, Language, and ESL Education; Teacher Education)

Further information on the above programs of study is available in the Fields of Instruction (i.e., academic departments) section of this catalog.

ADMISSION TO THE PH.D. IN EDUCATION

Application Process

Individuals seeking admission to the Doctor of Philosophy degree in Education must first be admissible to the University of Tennessee (see the Graduate Studies: Admission Requirements section of this catalog) and then admitted to a concentration within the Ph.D. in Education. Prospective students are encouraged to make application at least 6 months before anticipated matriculation or one year in advance for School Psychology (i.e., Deadline: January 1). An online application process is available at http://www.cehhs.utk.edu/departments.html.

Admission Criteria

An applicant seeking admission to the Ph.D. in Education should earn GRE scores equal to or higher than the 50th percentile for both the Verbal and Quantitative subtests of the GRE (minimum 1070-total points, based on October 1998-September 2001 norms for the Verbal and Quantitative subtests). An applicant scoring less than the 50th percentile on the Quantitative subtest will be expected to earn a sufficiently higher score on the Verbal subtest to equal or exceed the 1070-point total. Applicants are expected to submit a minimum score of 4.0 points on the Analytic Writing. Non-native English speaking applicants and applicants who took the GRE prior to October 2002 should consult the faculty staff the concentration of interest for details regarding the GRE minimum scores.

Additional information on admission criteria (e.g., GRE, letters of reference, writing samples, etc.) is available at http://www.coe.utk.edu/degrees/phd/phd_guidelines(WebVersion).pdf and in the Fields of Instruction section of this catalog, see specific academic department.

CORE COURSE REQUIREMENTS

<table>
<thead>
<tr>
<th>Courses</th>
<th>Minimum Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Area</td>
<td>15</td>
</tr>
</tbody>
</table>

Core Requirements:

- Seminar in primary concentration ........ 3
- Philosophy of science or history/philosophy of education (select one from Philosophy 446 or 546 or courses identified in the addendum to Ph.D. guidelines or Cultural Studies in Education 607) ............... 3
- Theoretical foundations and/or applications (select one): ............ 3
- Learning and curriculum theory (Educational Psychology 609, 515, or Psychology 560) ............................... 3
- Administrative/leadership theory (Educational Administration and Supervision 513, 680, or Educational Administration and Policy Studies 514) ............................... 3
- Group dynamics (Counseling 554) ............................... 3
- Instructional technology (Instructional Technology and Educational Studies 573 or 575) ............................... 2
- Concentration Minimum 15 credit hours selected from a concentration ............... 15

Specialization Minimum 9 credit hours selected from a specialization ............... 9

Cognate Minimum 6 credit hours selected from outside the college (not to include research courses) ............... 6

Dissertation ........................................ 24

Note: Please refer to the Fields of Instruction (i.e., academic department) of this catalog for additional information on course requirements.

Residency

The residency requirement for students in the Ph.D. in Education is three consecutive semesters of full-time enrollment.

Contact Information

Additional information on the Ph.D. in Education is available in the Fields of Instruction section of this catalog, through the College's Student Services Center, Claxton Complex A332, or at http://cehhs.utk.edu/main.html.

GRADUATE COURSES

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.

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.

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 academic 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.
Educational Administration and Policy Studies

(College of Education, Health, and Human Sciences)

MAJORS DEGREES

College Student Personnel ................. M.S.
Educational Administration ............. M.S., Ed.S.
Educational Administration and Policy Studies ............ Ed.D.
Education ....................................... Ph.D.

Olga Welch, Interim Head

Professors:
Bogue, Grady, Ed.D. ............... Memphis State
Brewer, Ernest W., Ed.D. .............. Tennessee
Mclnnis, Malcolm, Ph.D. .......... Florida State
Mertz, Norma T., Ed.D............... Columbia
Pettey, Gregory C., Ph.D. .......... Missouri
Ubben, Gerald C., Ph.D. ............. Minnesota

Associate Professors:
Anfara, Vincent, Ph.D. .......... New Orleans
Norris, Cynthia, Ed.D. .......... Tennessee

Assistant Professors:
Patterson, Faye E., Ed.D. .......... Tennessee

The Department of Educational Administration and Policy Studies participates in graduate programs leading to degrees, majors, and concentrations in:

Master of Science
College Student Personnel
Educational Administration
Specialist in Education
Leadership 21

Educational Administration
Educational Administration and Supervision
Doctor of Education

Educational Administration and Policy Studies
Educational Administration and Policy Studies Higher Education
Doctor of Philosophy

Education
Educational Administration and Policy Studies

The mission of the Department of Educational Administration and Policy Studies is to prepare entry-level and executive-level administrators for schools and colleges, and to prepare policy scholars to serve in these organizations in state, regional, and national policy agencies associated with the educational and human service enterprise. The graduate degree programs in the department are designed to enrich the knowledge, skills, and values requisite to effective leadership in educational practice settings. The department views leaders as stewards and servants of organizations; designers of the social and cultural climate in which we do our work; teachers that facilitate human growth and development; change agents who continually examine the effectiveness of their organizations; and conceptual provocateurs who challenge ideas and assumptions on which practice and policy are built.

The graduate programs in Educational Administration and Policy Studies focus on the preparation and development of administrative and instructional leaders who will serve in the diverse settings of schools and colleges, community and human service agencies, adult and continuing education organizations, and educational units of government.

THE MASTER'S DEGREES

The department offers a Master of Science degree with a major in College Student Personnel and a Master of Science degree with a major in Educational Administration.

• College Student Personnel
  The major in College Student Personnel (CSP) is a practitioner-oriented program that offers training in university administration. It is designed for individuals interested in entering higher education administration in those areas that serve students and lend support to the effective operation of higher education institutions. The program prepares students for a wide variety of positions including Admissions, Career Planning and Placement, Academic Advising, Student Activities, Student Records, Residence Life, Development, Alumni Affairs, and Athletics. Students in the program are encouraged to gain practical experience by participating in practica throughout the University as well as in local area colleges.

Admission Requirements
  Students are admitted to the CSP program each spring for matriculation in the fall. Prospective students must submit current GRE scores (within the last five years). In addition, the following information must be submitted to the departmental office by March 1:
  1. CSP Program Application Form (http://web.utk.edu/~collsp);
  2. Three rating/reference forms; application to the School of Graduate Studies. It is recommended that all materials be submitted by February 15.

Degree Requirements
  The CSP program requires a minimum of 36 hours including six hours of practicum experience. Students are required to complete either a thesis or problems in lieu of thesis as a culminating activity.

• Educational Administration
  Leadership 21 concentration is offered under Educational Administration. In both content and process, the Leadership 21 curriculum is directed toward providing beginning practitioners with the “best practices,” knowledge and skills derived from the field and from research, and encourages transfer of these “best practices” into their work settings.

Leadership 21
  This concentration is designed to prepare school principals and supervisors for licensure in Tennessee and for success in their initial administrative assignments.

Leadership 21 is an NCATE approved program that follows the Interstate School Leaders Licensure Consortium (ISLLC) Performance Standards and the National Policy Board for Educational Administration (NPBEA) recommendations for the knowledge, skills, and dispositions required today for school principals and administrators. The Leadership 21 program begins each year in the summer term. The four major themes of the program are as follows:

1. Expansion of the knowledge base that forms the framework for leadership and a broader conceptualization of educational organizations;
2. Emphasis on the performance dimensions of the principalship and administration with particular attention given to the knowledge, skills, and dispositions underlying performance;
3. Integration of theory and practice;

Admission Requirements
  Applicants must complete the graduate and Leadership 21 application forms by March 15. A grade point average (GPA) of 2.7 or higher for undergraduate work or GPA of 3.2 or higher for prior graduate work is required. Applicants to the Leadership 21 must possess a teacher licensure and three years teaching experience and must interview with an admission committee. Candidates for the Educational Administration major must possess leadership potential preferably demonstrated by previous leadership experience. Three rating forms must be provided with recommendations from three present or former employers that identify a candidate’s strengths, weaknesses, and leadership potential.

Degree Requirements
  The M.S. degree in Educational Administration requires a minimum of 36 hours of study including a site-based internship. A final comprehensive examination is required including the presentation of a professional portfolio. For licensure, students must pass an examination required by the state of Tennessee.

THE SPECIALIST DEGREE

The department offers a Specialist in Education degree with a major in Educational Administration. This degree is designed for those students who already possess a master's degree. This degree may be used for the school administrator licensure (see admission and degree requirements under Leadership 21).

Admission Requirements
  Applicants must complete all applications forms by March 15. These include the School of Graduate Studies application and for those interested in licensure, the Leadership 21 application. A current GRE score is required for admission and a grade point average (GPA) of 2.7 or higher for undergraduate work or GPA of 3.2 or higher for prior graduate work is required. Three rating forms must be provided with recommendations from three present or former employers that identify a candidate’s strengths, weaknesses, and leadership potential.
Degree Requirements

Programs leading to the Ed.S. degree in Educational Administration require a minimum of 39 hours of study. A final comprehensive examination is required as is a culminating research paper or thesis depending on the program.

THE DOCTORAL DEGREES

Program Goals and Accents

Doctoral study in the Department of Educational Administration and Policy Studies is designed to prepare executive level administrators in school, college, and human services settings and to prepare policy scholars for policy organizations related to education. The Department offers the Doctor of Education (Ed.D.) degree and a Doctor of Philosophy (Ph.D.) degree.

Doctoral study is designed (1) to accent the heritage of educational enterprise and its centrality to the strength of a democratic society, (2) to equip students with the disposition and to confront the challenge of the status quo and to engage in evaluative policy dialogue and scholarship regarding the role and performance of educational and workforce development/training organizations, (3) to link competence and conscience via the study of ethics and to exemplify in practice those values previously cited, (4) to emphasize involvement in and exposure to educational experiences with international import, and (5) to accent leadership as a conceptual, moral, and performing art built on reflective traffic between theory and practice.

The department places high value on community—a community of shared purpose and caring, of shared values and responsibility. The departmental Leadership Forum creates a regular and common opportunity for students and faculty to explore contemporary policy issues and to develop a community of scholarship. The Leadership Forum is an educational experience in which students, and faculty, learn to create and maintain community by holding competing impulses and ideas in balance—to revere heritage and to manage change, to honor access and to expect excellence, to insure rights and to call for responsibility, to respect competition and to esteem collaboration, to honor both service and profit motives.

Admission to Doctoral Study

Students must submit the UT Graduate Application for Admission and the EAPS Application for Graduate Study. Admission applications must be accompanied by GRE scores from the past five years and three (3) academic or professional letters from those who know of the candidate’s leadership record and promise. An overall GPA of 3.3 in previous graduate study is required for admission to doctoral study and an interview with the faculty may be required. Admissions decisions are made on a holistic basis to discern the candidate’s promise for doctoral study and to ascertain the match of the candidate’s educational goals with the resources and goals of the department.

Course of Study

The doctoral program involves approximately 48 semester hours beyond the master’s degree, completion of a comprehensive examination, completion of the residence requirement, and submission and defense of the doctoral dissertation. Core educational experiences in leadership and organizational theory, educational history/philosophy, ethics, and policy/research will be required of all doctoral students as outlined in the departmental Graduate Student Handbook and departmental brochures (Graduate Study in Educational Administration and Policy Studies). Core experiences are complemented by specialty study in two specializations (Educational Administration and Policy, Higher Education Administration) via selected courses in the college, in cognate work of departments outside the college, and in readings/independent studies/internship course experiences.

Admission to candidacy requires successful completion of a written and oral comprehensive examination as required by the School of Graduate Studies, and an overall GPA of 3.5 on all doctoral work is required to sit for the departmental comprehensive examination.

The department offers two School of Graduate Studies approved options for satisfying residence requirements: (1) full time enrollment in two consecutive semesters or (2) enrollment in the Leadership Forum (EAPS 606) for six consecutive semesters concurrent with enrollment in two 3-hour courses during those semesters.

FINANCIAL ASSISTANCE OPPORTUNITIES

The department offers a variety of scholarship and financial assistance opportunities for qualified students. Graduate Assistantships are also available. For application forms and information about financial aid and other information about the graduate programs in Educational Administration and Policy Studies, write to the Department of Educational Administration and Policy Studies, The University of Tennessee, A325 Claxton Complex, Knoxville, Tennessee 37996-3430.

Educational Administration and Policy Studies

GRADUATE COURSES

500 Thesis (1-15) P/NP 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. SNC OC.

503 Problems in Lieu of Thesis (2-3) May be repeated. Maximum 9 hrs. SNC only.

513 Administrative and Organizational Theory (3) Introduction to theoretical and administrative and organizational foundations of management and leadership of educational programs and institutions.

514 Leadership Themes in Literature (3) Review and analysis of biographies, poetry, plays, essays, personal letters and speeches, history—for lessons that enhance understanding of leadership role, values, and effectiveness.

515 Human Relations and Communication in Administration (3) Development and use of effective interpersonal communication skills and channels, interpersonal relations, supportive work climates, personal motivation, conflict management skills, and role of values, attitudes, and expectations in administration.

516 Research Methods (3) Descriptive, experimental, and quasi-experimental designs to help students without quantitative backgrounds to read and understand technical professional literature. Introduction to inferential statistics, needs assessments, and evaluation procedures.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only.

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 learner characteristics, program categories, service delivery models, and legal/ethical frameworks. Inclusion and full service delivery.

529 Politics and Public Relations in Education (3) School/community relations in political context of modern, complex society and supervisory competencies: political, social, ethical, cultural, and racial environments in which schools operate.

534 Program Evaluation in Education (3) (Same as Curriculum, Educational Research and Evaluation 533.)

535 Administrative Applications of Micro Computers (3) DOS, word processing, data based management, spreadsheet, and computer communications. Review and development of specific administrative applications including scheduling, attendance, student record systems, and accounting.

536 Policy Issues in Higher Education Quality Assurance (3) Exploration of historic and contemporary approaches to definition and demonstration of quality in higher education to 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 policies, rationales for assessment policy and practice, constructs and outcomes typically assessed, methods for conducting assessment, and uses of assessment data. Philosophies, priorities, and values, recent assessment efforts in higher education.

542 The College Student and the Court (3) Legal precedent affecting student personnel services in public higher education. Student discipline, housing, 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.

544 School Finance and Business Management (3) For prospective building level administrators. Financial and logical management tasks and procedures in individual school setting.

548 Supervision and Personnel Administration (3) Basic supervisory and personnel concepts and related competencies at the micro-organizational level: interviewing, personnel planning, collecting and maintaining employee information, policy and procedures, performance appraisal and staff development.

553 Strategic Planning (3) Processes for improving decision-making function through use of both quantitative and qualitative planning techniques. Policy analysis, CPM, PERT, Delphi.

554 Policy Issues in Educational Law, K-12 (3) Basic theoretical and managerial materials for public school administrators and teachers; problems concerning law and public education. Prereq: M.S. introductory core or consent of instructor.

560 Grant Writing and Project Management (3) Examines processes and identifying funding for research efforts, as well as writing grant proposals, negotiating with funding sources, implementing and maintaining funded projects, and closing out projects at the end of funding support.
570 Student Affairs Administration in Higher Education: Theory and 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 to administrative theory, human development theory and evaluation assessment techniques.

574 The College Student (3) Critical examination of the characteristics and concerns of current college students in relation to the direction and provision of student services and student personnel administration.

580 Internship in Educational Administration (3) Field experience in appropriate educational setting working directly with administrator. May be repeated up to 6 hours.

583 Educational Leadership—Principalship (3) Knowledge, skills and relationships for principals to be effective educational leaders. Simulation materials and field-based activities are used.

590 Special Topics (1-3) May be repeated.

592 Field Problems in Educational Administration and Supervision (3) Topic to be assigned. May be repeated. Maximum 6 hours. S/NC or letter grade.

593 Independent Study (1-3) Consent of instructor required. May be repeated. Maximum 9 hours. Satisfactory/No Credit or letter grade.

595 Seminar in School Leadership, K-12 (3) On-site study of quality school processes throughout the region. May be repeated. Maximum 6 hours. S/NC or letter grade.

599 Internship in College Student Personnel (1-6) Prereq: Consent of instructor. May be repeated. S/NC only.

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

604 Seminar in Educational Administration and Policy Studies (1-4) Directed readings and research in educational administration. May be repeated. Maximum 6 hrs. Satisfactory/No Credit grading only.

605 Advanced Seminar in Administrative Theory (3) Interdisciplinary seminar. Readings selected by faculty for research and scholarly values from early to current classic theoretical studies and current periodical literature in administrative and organizational theory.

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, May be repeated. Maximum 12 hrs. Satisfactory/No Credit grading only.

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.

612 Modes of Inquiry (3) Various inquiry approaches to research in education, related philosophical, methodological and ethical considerations in research design and in the use of research findings. (Same as Educational Psychology 612.)

614 Statistics for Educational Administrators (3) An introductory statistics course that focuses on the application of statistical procedures to problems in educational administration. Included are: scales of measurement, hypothesis testing, and descriptive and inferential statistical techniques. Computer applications are explored.

615 Research Design (3) The foundations of designing, conducting, and evaluating quantitative, qualitative, and mixed-methods research and the philosophical assumptions underlying these approaches. Topics covered include: identifying a research problem, reviewing the literature, specifying a purpose, writing research questions and hypotheses, and collecting and analyzing data.

616 Research Methods (3) The techniques of multiple regression, analysis of covariance, and multivariate analysis as applied to problems in educational administration. Computer applications are explored. Prereq: 614.

617 Case Study Methods in Educational Research (3) Methods, techniques and strategies consistent with case study approaches to inquiry in educational and related settings. Prereq: 615.

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.

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 education policy, and conceptual frameworks to use for future understanding.

640 Policy Issues in College and University Law (3) Legal precedent affecting organizations, administration, and finance of higher education. Academic freedom, faculty termination, relief, fine, tort liability, administrative law, academic due process and affirmative action in employment.

645 Curriculum and Instruction in Higher Education (3) Examination of teaching, learning and curriculum in higher education.

646 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.

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.

656 Legal Issues in Education (3) School law; constitutional foundations as they relate to public education at state and local levels.

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.

670 Values and Ethics in Educational Leadership (3) Examination of moral and ethical dimensions of the work of educational leaders.

680 Administration of Complex Organizations (3) Concepts and theoretical formulations to understand, analyze, evaluate, and change complex educational programs and organizations.

690 Special Topics (1-3) May be repeated.

693 Independent Study (1-3) May be repeated. S/NC or letter grade.

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### Educational Psychology and Counseling

**Degree Programs**

- **MAJOR**
  - Counseling
  - Educational Psychology
  - School Counseling

- **DEGREES**
  - M.S.
  - Ph.D.
  - Ed.D.

**School Psychology**

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### Admissions

- **Applicants**
  - Must have a Bachelor’s degree from an accredited institution.
  - At least 2 years of professional experience.

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### Tuition

- **In-State**
  - $12,000 per year
  - $24,000 for two years

- **Out-of-State**
  - $18,000 per year
  - $36,000 for two years

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### Financial Aid

- **Nationwide Scholarships**
  - Merit-based scholarships
  - Need-based grants

- **State-Specific Scholarships**
  - Georgia PEO Scholarships
  - California State University Grants

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### Contact Information

- **Admissions Office**
  - 123 University Avenue
  - Athens, GA 30602
  - Phone: (706) 542-2345
  - Email: admissions@uga.edu

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### Campus Resources

- **Library**
  - 10:00 AM - 11:00 PM
  - Closed on holidays

- **Counseling Center**
  - 8:00 AM - 5:00 PM
  - Closed on weekends

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### Upcoming Events

- **Annual Conference**
  - November 15-17
  - Athens Convention Center

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### Contact for More Information

- **Department Chair**
  - Dr. Jennifer Martinez
  - Email: jmartinez@uga.edu

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### Website

- [University of Georgia Counseling Program](https://www.uga.edu)

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### Additional Resources

- **Professional Organizations**
  - American Counseling Association
  - Society for Research on Educational Effectiveness

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### FAQs

- **How long does it take to complete the program?**
  - The program takes 2 years to complete.

- **What is the average cost of tuition?**
  - In-state tuition is $12,000 per year, and out-of-state tuition is $18,000 per year.

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### Contact for Inquiries

- **Graduate Admissions Office**
  - 123 University Avenue
  - Athens, GA 30602
  - Phone: (706) 542-2345
  - Email: admissions@uga.edu

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### Additional Notes

- **Required Courses**
  - Educational Psychology
  - Counseling Theory
  - Research Methods

- **Elective Options**
  - School Psychology
  - Educational Technology
  - Multicultural Education

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### Supporting Institutions

- **Educational Psychology and Counseling Department**
  - 123 University Avenue
  - Athens, GA 30602
  - Phone: (706) 542-2345
  - Email: admissions@uga.edu

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### Conclusion

The University of Georgia offers a comprehensive program in Educational Psychology and Counseling, designed to prepare students for leadership roles in the field. With a focus on research, teaching, and applied practice, the program provides students with the skills and knowledge necessary to contribute to the field of education and counseling.
education, business and industry, government community-based organizations, volunteer agencies, and professional and staff development programs. The program prepares individuals for such roles as program planner, instructor, trainer, and administrator. Degrees offered are the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.). For details, see we site at http://web.utk.edu/~adulted/

MASTER OF SCIENCE (M.S.)
Education Psychology major
Adult Education concentration

The Master’s program involves a minimum of 36 hours of course work (except for the Thesis option, which is 33 hours minimum). Programs typically consist of the following:

- Adult Education Core (15 hrs.)
  - EP 510 - Psychological Theories of Human Development Applied to Education (3 hrs.)
  - EP 511 - Internship in Adult Education (3 hrs.)
  - EP 512 - Program Development and Operation in Adult Education (3 hrs.)
  - EP 522 - Adult Development (3 hrs.)
  - EP 525 - Characteristics of Adult Learners (3 hrs.)
  - Research (3 hrs.)
- Options could include:
  - EP 550 - Statistics and Research Design: Conceptual (3 hrs.);
  - CSE 560 - Introduction to Qualitative Research in Education (3 hrs.);
  - EAS 516 - Research for School Administrators (3 hrs.);
  - EP 530 - Methods of Collaborative Inquiry (3 hrs.);
  - ITCE 561 - Educational Statistics (3 hrs.); or
  - ITCE 580 - Techniques of Research in Curriculum and Instruction (3 hrs.)
- Courses Outside of Educational Psychology (6 hrs.)
  - This category will include course work outside of Educational Psychology that provides a more specialized focus to the program or as a complement to current professional competencies. Some examples of possible supporting areas include: higher education, counseling, educational administration and supervision, cultural studies, sociology, psychology, human resource development, and agricultural and extension education.

Departmental Electives (12+ hrs.)

The remaining hours of course work can be taken in a combination of electives within adult education or course work in related areas. Examples of courses in Educational Psychology that meet this expectation include:

- EP 460 - Self-Management in the Helping Professions (3 hrs.)
- EP 504 - Special Topics (1-3 hrs.)

(Recent examples have included Multicultural Perspectives in Adult Education, Learning in the Workplace, and Writing for Professional Publication)

- EP 590 - Internship in Adult Education (3 hrs.)
- EP 510 - Psychological Theories of Human Development Applied to Education (3 hrs.)
- EP 514 - Individual Study in Adult Education (3 hrs.)
- EP 515 - Educational Applications of Behavioral Theories of Learning (3 hrs.)
- EP 516 - Educational Applications of Cognitive Learning Theories (3 hrs.)
- EP 523 - Post-Secondary Education for Adults (3 hrs.)
- EP 524 - Continuing Professional Education (3 hrs.)
- EP 527 - Controversies in Adult Education (3 hrs.)
- EP 528 - Psychology of Aging (3 hrs.)
- EP 529 - Facilitating Adult Learning (3 hrs.)
- EP 573 - Meeting the Needs of Nontraditional and Underachieving Learners (3 hrs.)
- EP 574 - Facilitating Group Change (3 hrs.)

Comprehensive Examination/Thesis

Most students opt to write a comprehensive examination. This involves preparing written responses to questions from the student’s graduate committee. Typically, these are done in a take-home format. However, a thesis option is also available. The thesis is an original piece of research. Students who opt to write a thesis register for 6 hours of EP 500. The final document is presented to the student’s graduate committee and discussed in an oral examination with the committee.

DOCTOR OF PHILOSOPHY (Ph.D.)
Education major
Educational Psychology concentration—Adult Education specialization

The Ph.D. specialization in Adult Education involves a minimum of 80 hours of study beyond the master’s degree. This includes at least 56 hours of coursework and 24 hours of dissertation. These hours are distributed as follows:

- Concentration 15 hours
- Specialization 9 hours
- Research 15 hours
- Ph.D. Core 11 hours
- Cognate 6 hours

The concentration consists of courses selected from various areas within the Educational Psychology and Counseling, which can include selected courses in adult education. Courses for the specialization are from adult education courses such as those listed under the masters’ degree requirements and electives. To meet the research requirement, students take courses that provide them with knowledge and skills in both quantitative and qualitative research methods.

The Ph.D. core consists of a seminar in the specialization along with courses listed elsewhere in this catalog. At least 6 hours must be taken in a cognate area outside the College of Education, Health, and Human Sciences. Finally, dissertation hours are taken after all or most coursework is completed; once begun, students must register for a minimum of 3 hours until the dissertation is completed.

- Applied Educational Psychology

The Applied Educational Psychology area is designed for individuals who seek to provide professional leadership in promoting and facilitating learning and/or its measurement. It offers two degree programs: Master of Science with a major in Educational Psychology, concentration in applied educational psychology, and Doctor of Philosophy with a major in Education, concentration in educational psychology, specialization in applied educational psychology.

For details, see we site at http://web.utk.edu/~appedsy

MASTER OF SCIENCE (M.S.)
Education Psychology major
Applied Education Psychology concentration

The basic goal of the master’s program is to develop expertise in the promotion of adaptive learning for all kinds of learners in both individual and group settings. The program includes most of the traditional themes in educational psychology (e.g., development, learning principles, assessment, and psychoeducational intervention). It is unique because of a focus on promoting the collective knowledge of groups as well as the development of individuals.

The master’s program may be used as a stepping stone for entering a doctoral program in educational or school psychology or as additional preparation for functioning in an educational role in schools, mental health centers, and business programs devoted to personal and professional development. The faculty members in the Educational Psychology (EP) Department are committed to the creation and study of environments that enhance learning potential and promote lifelong learning for people of all ages, abilities, and backgrounds.

Each student completes 36 hours beyond the baccalaureate degree. A minimum of 24 hours must be at the 500 level or higher. At least 6 hours must be taken outside the department. These hours are distributed across the following categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Development</td>
<td>6</td>
</tr>
<tr>
<td>2. Learning Principle</td>
<td>9</td>
</tr>
<tr>
<td>3. Research</td>
<td>3</td>
</tr>
<tr>
<td>4. Assessment</td>
<td>3</td>
</tr>
<tr>
<td>5. Intervention</td>
<td>12</td>
</tr>
</tbody>
</table>

The courses related to development help students explore the role of development in learning for more able and less successful learners. The courses related to learning principles provide an opportunity to compare behavioral and cognitive learning theories in depth and other theories in comparison. Students may study characteristics of adult learners as well as children. The emphasis is
The Concentration Core provides a grounding in educational psychology, with required courses such as Psychology of Learning, Theories of Human Development, Applied to education, and Formal Measurement. The Specialization involves 12 hours of the doctoral seminar in Applied Educational Psychology, 3 hours of Facilitating Group Change, and 12 hours reflecting the student's area of emphasis. Students with a Learning/Development emphasis, course options include (but are not limited to) Mediated Learning Theory, Educational Applications of Cognitive Learning Theories, Collaborative Learning, and Seminar in Cognitive Science. For students with the Statistics/Testing emphasis, course options include (but are not limited to) Survey Design and Analysis, Categorical Data Analysis, Applied Multivariate Methods, and Scale Construction.

To meet the 15-hour requirement in Research, students can elect to take a full set of courses that deal with quantitative methodologies (e.g., experimental design, Seminar in Applied Psychometrics) or they can elect to take a full set of courses that deal with qualitative methodologies (e.g., phenomenology, ethnography) or they can elect to take a mix of these courses. The Cognate requires a minimum of two courses outside the College of Education, Health, and Human Sciences. Many students set up their cognate to be psychology or statistics, although other cognates are possible.

The requirements/options for the Ph.D. Core are listed elsewhere in this Catalog, as are the requirements for the 24 hours of Dissertation.

COUNSELING

The programs within the Counseling area prepare individuals as professional counselors and counseling educators in community mental health, human service and rehabilitation agencies, educational institutions, and private practice, government, business and industrial settings. The courses of study focus on professional identity, social and cultural diversity, human growth and development, career development, helping relationships, group work, assessment, and research and program evaluation. The degrees offered are Master of Science in Counseling with concentrations in School Counseling, Mental Health Counseling, and Rehabilitation Counseling; Educational Specialist in School Counseling; Doctor of Philosophy in Education with a concentration in Counselor Education. Each degree leads to counseling licensure. The Mental Health Counseling and School Counseling programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The graduate program in Rehabilitation Counselor Education (RCE) is designed to prepare students for professional careers as clinicians in the field of rehabilitation counseling. The RCE Program is service-oriented and includes practica and internship experiences. Completion of the 2 (16 month) Program culminates in a Master of Science Degree. The Program is fully accredited by the Council on Rehabilitation Education (CORE).

Students may be admitted to the Program either full- or part-time. Full-time students admitted to the Program follow a sequence of courses that facilitates degree completion in 16 months. The first (fall) and third (summer) semesters are didactic in nature, but the second semester adds an experiential component under RCE 547 – Practicum in Rehabilitation. The final (fall 2) semester is experiential, with students working full-time to fulfill the 600-hour requirement of RCE 549 – Internship in Rehabilitation Counseling.

Students who are interested in working with people who are deaf or hard of hearing may choose the optional deafness focus area for their RCE masters program. This allows individuals who have bachelor degrees in deafness related fields to expand their competencies to serve rehabilitation consumers who are deaf or hard of hearing. Interested students must have knowledge of American Sign Language. Contact Terry Osborne at the Center on Deafness (COD) for details: (865) 974-4147 (voice/TTY).
The following is the recommended course of study for full-time RCE Program students:

**Fall 1**
- COUN 551 Theory and Practice of Counseling
- RCE 540 Orientation to Rehabilitation
- RCE 543 Medical Aspects of Disability
- RCE 545 The Rehabilitation Interview
- RCE 592 Assistive Technology in Rehabilitation
- RCE 549 Internship (second year students only)

**Spring 1**
- EDUC PSYCH 550 Techniques in Research
- RCE 547 Practicum in Rehabilitation
- RCE 532 Caseload Management in Rehabilitation
- RCE 557 Vocational Evaluation: Clinical Methods
- RCE 579 Disability Management
- RCE 549 Internship (second year students only)

**Summer 1**
- RCE 533 Job Analysis and Placement
- RCE 579 Special Topics: Research Project in Rehabilitation
- COUN 570 Cross-Cultural Counseling (Elective)
- COUN 554 Group Dynamics
- RCE 549 Internship (second year students only)

**Fall 2**
- RCE 549 Internship (second year students only)

Students are admitted to RCE classes upon program admission only. All RCE courses, with the exception of RCE 549, are offered only one semester per year. Students who are admitted to the Program must meet with an advisor each semester to plan their studies.

Program Contacts
Dr. Amy L. Skinner LPC, CRC, NCC
Program Coordinator, askinner@utk.edu
LeeAnn R. Grubbs CRC
Instructor & Recruitment Coordinator, lgrubbs@utk.edu

Terry Osborne
Instructor & Deafness-Focus Area Advisor, osborne@utk.edu

**MASTER OF SCIENCE (M.S.) Counseling major**

School Counseling concentration

The Masters Program in School Counseling, a 48-semester hour program, is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The purpose of the program is to develop graduates who will assume the major responsibilities of a counselor within elementary and secondary schools. Applicants for degrees in this field must present satisfactory evidence of academic ability, adequacy of personal characteristics and goals as determined by recommendations of employers, instructors, and colleagues, and by scores of the aptitude portion of the Graduate Record Examination.

The program requires a 600-hour internship in a school site during the second year to prepare students for practice. Students enrolled complete a program that includes core courses, clinical courses, and electives. Those applicants who have not had teaching experience may be required to complete additional classes. Graduates will fulfill the license requirements for K-12 School Counseling in Tennessee and in most states of the United States although some states may have additional experience and testing requirements.

**Year 1:**
- COUN 431 3
- COUN 525 3
- COUN 550 3
- COUN 551 3
- COUN 552, 553 6
- COUN 554 3
- EDUC PSYCH 550 3

**Year 2:**
- COUN 555 3
- COUN 558 6
- COUN 561 3
- COUN 570 3
- EDUC PSYCH 510 3
- EDUC PSYCH 515 3
- TPTE 470 3

Total program hours 48

**EDUCATIONAL SPECIALIST (Ed.S.) School Counseling major**

The Educational Specialist Program in School Counseling, a post Master’s program designed to provide advanced training for school counselors and others with a Master’s Degree in a related area. Graduates must complete at least 60 hours beyond the bachelor’s degree. Applicants for degrees in this field must present satisfactory evidence of academic ability, adequacy of personal characteristics and goals as determined by recommendations of employers, instructors, and colleagues, and by scores of the aptitude portion of the Graduate Record Examination.

The program can serve the educational needs of the following: Experienced counselors whose original training pre-dated many recent advancements in counseling; Students holding M.S. degrees in guidance but wanting additional training; Individuals who wish to shift from one setting or level of counseling to another; Students from related areas who want to enter the school counseling profession.

Those applicants who have not had teaching experience may be required to complete additional classes. Graduates who desire to fulfill the license requirements for K-12 School Counseling in Tennessee and in most states of the United States are required to fulfill all the requirements for a licensure endorsement.

For a student with a School Counselor License, the Ed S. program requires 22 semester hours beyond the MS. The program is individualized and planned by the student and a faculty committee. A minimum of six hours is required from outside the Counselor Education Program. Please refer to the current Graduate Catalog for general information on the Ed.S.

**Year 1:**
- School Counseling Core
- COUN 555, 659, 570, 504, 650 13
- Courses outside the program area (six hours of electives) 6
- General elective 3

Total program hours 22

* Students without a license in school counseling are required to complete those requirements before obtaining an Ed. S. in School Counseling.

**DOCTOR OF PHILOSOPHY (Ph.D.) Education major**

Counselor Education concentration

The doctorial concentration in Counselor Education at The University of Tennessee is designed to prepare experienced counseling professionals to advance their careers in the education and supervision of counselors. The doctoral program is for those students who have completed a master’s degree in counseling or counseling-related fields who aspire to one of the following careers: (1) college, university, or community college teaching positions in Counselor Education or related fields; (2) supervisory positions in schools, community agencies, state departments of education; (3) counseling positions in student development programs and counseling centers in higher education; (4) private mental health counseling/consultation practice; and/or (5) employee assistance positions.

The doctoral program requires a minimum of three full years of study beyond the master’s degree. The Ph.D. concentration in Counselor Education will seek accreditation from the Council for Accreditation of Counseling and Related Educational Programs (CACREP). Graduates of the Ph.D. concentration in Counselor Education will receive endorsement for licensure as professional counselors and/or licensure as school counselors. If licensure has not been received prior to entering the doctoral program.

Coursework for the program in Counselor Education includes the following:

**CEHHS/Counselor Education Ph.D. Coursework Guidelines**

- Concentration 33 Hours
  - COUN 553 (3 Hours): Career and Educational Information Systems and Resources
  - COUN 571 (3 Hours): Individual Cognitive Assessment OR COUN 671 (3 Hours): Personality and Vocational Assessment OR Educational Psychology 541 (3 Hours): Psycho Educational Assessment OR COUN 625 (3 Hours) Advanced Study in Personality
  - COUN 655 (3 Hours): Practicum in Counselor Education
  - COUN 660 (3 Hours): Advanced Theory and Practice in Counseling
  - COUN 665 (3 Hours): Group and Systems Theory and Interventions
  - COUN 670 (3 Hours): Theory and Practice of Counseling Supervision and Consultation
COUN 675 (3 Hours); Theory and Practice of University Teaching in Counselor Education
COUN 679 (6 Hours); Internship in Counselor Education
COUN 672 (3 Hours); Psychology of Dysfunction OR Psychology 573 (3 Hours);
Descriptive and Theoretical Psychopathology OR Social Work 530 (3 Hours); Seminar in Clinical Social Work OR Educational Psychology 690 (3 Hours); Psychopathology of Children
Sociology 543 (3 Hours); Sociology of Development OR Social Work 532 (3 Hours);
Community Organization OR Sociology 465 (3 Hours) Social Values and the Environment
• Specialization 9 Hours (Not Counselor Education)
• Cognate 6 Hours
• Core 11 Hours
  Seminar in Primary Concentration: COUN 650 (3 Hours); Seminar in Counselor Education
  Philosophy of Science (3 Hours) (substitute COUN 535 Ethical, Legal, and Professional Issues in Counseling)
  Theoretical Foundations and/or Applications (3 Hours)
  Trans college Seminar (2 Hours)
• Research 15 Hours
  9 Hours Quantitative Research including a two semester statistics sequence
  6 Hours Qualitative Research
• Dissertation 24 Hours
• Total 98 Hours

EDUCATIONAL PSYCHOLOGY AND COUNSELING

Collaborative Learning
The Collaborative Learning program addresses the advanced educational needs of professionals working in a variety of settings including business, government, higher education, and non-profit organizations. Participants study the collaborative learning process and engage in action research in the context of their own professional practices. The program offers the Doctor of Education (Ed.D.) degree. A cohort of doctoral students is admitted every other year. For details see web site at http://web.utk.edu/~schpsy.

DOCTOR OF EDUCATION (Ed.D.)
Educational Psychology and Counseling major

Collaborative Learning concentration

Doctoral students in Collaborative Learning are expected to complete a minimum of 93 hours of graduate credit above the baccalaureate degree. Required is a two-year residency, defined as a minimum of 6-9 credit hours of course work in each of six consecutive semesters, including summer terms. These hours are distributed among the following categories:

Concentration Core in Educational Psychology (15 hours). The Concentration Core consists of a minimum of one course in the area of Collaborative Learning and one course from each of the other specializations in Educational Psychology; Adult Education and Applied Educational Psychology.

Specialization Core in Collaborative Learning (24 hours). The specialization core consists of four courses in the area of Collaborative Learning plus the doctoral seminar. EP 630 Doctoral Seminar in Collaborative Learning is taken on a continuous basis, beginning with the first semester of the student’s residency and culminating at the end of the second year of residency, excluding summers. Three credit hours are awarded per semester for a total of 12 hours of credit.

Related Studies (30 hours). The related studies component incorporates three areas of study:
  Research Methods (12 hours). This set of courses normally includes courses in qualitative and quantitative research methods and statistics. EP 530, Methods of Collaborative Inquiry is required.
  Cognate (6 hours). Courses taken in an area outside the major area of study.
  Supporting Area (12 hours). Additional courses of the student’s choice that support his or her program emphasis.

Dissertation Research (24 hours). The focus of the student’s dissertation research is his or her own professional practice and therefore must involve some form of action research methodology.

SCHOOL PSYCHOLOGY

The School Psychology programs are based on a data-based decision making model and offer advanced training in psychological, educational, and professional foundations including training in assessment, research, consultation, and intervention. We offer two degree programs, an Ed.S. and a Ph.D. The school psychology programs are accredited or approved by the relevant bodies including the American Psychological Association (APA), the National Association of School Psychologists (NASP), the National council for Accreditation of Teacher Education (NCATE), and the Tennessee Department of Education. Admission occurs once a year and materials are due by January 15. For details see web site at http://web.utk.edu/~schpsy.

SPECIALIST IN EDUCATION (Ed.S.)

School Psychology major

Every School Psychology student is expected to meet UT School Psychology Training Programs knowledge and skill requirements. Opportunities for students to meet these requirements will occur in the classroom and during field experiences. The School Psychology faculty, along with current and previous students, practica and internship supervisors, and various other groups who help ensure quality control within our training programs have contributed to the development of our curricula. Various credit and curricula oversight agencies (i.e., NASP, SDE-Tennessee; UT Ph.D. Coordinating Committee; and UT Graduate Admissions and Records) have their own specific goals and objectives. The School Psychology Handbook, published by the EP Department describes how the UT School Psychology Training Programs meets the goals and objectives of these various training groups.

The UT Program is designed to provide graded, sequential, and hierarchical training across the following areas A) Professional School Psychology, B) Consultation and Intervention, C) Assessment, D) Research and Statistics, E) Psychoeducational Core, and F) Field Experience and Professional Practice.

I. Professional School Psychology (15 credit hours)
1. EP 540 Seminar in School Psychology (3)
2. EP 635 Ethical, Legal, and Professional Issues in Psychology(3)
3. EP 650 Professional Practice in School Psychology (3)
4. EP 549 Internship (6)

II. Consultation and Intervention (27 credit hours)
1. CECP 551 Theory and Practice of Counseling (3)
2. Group Process and Change Option (3)
3. EP 515 Educational Applications of Behavioral Theories of Learning (3)
4. EP 517 Direct Assessment and Intervention for Academic Skill Deficits (3)
5. EP 545 Psychoeducational Consultation (3)
6. EP 546 Practicum in Consultation (3)
7. EP 516 Educational Applications of Cognitive Learning Theories (3)
8. EP 549 Internship (6)

III. Assessment (24 credit hours)
1. EP 517 Direct Assessment and Intervention for Academic Skill Deficits (3)
2. CECP 525 Formal Measurement in Education and Counseling (3)
3. EP 541 Psychoeducational Assessment (3)
4. EP 542 Practicum in Psychoeducational Assessment (3)
5. EP 541 Psychoeducational Assessment (3)
6. EP 542 Practicum in Psychoeducational Assessment (3)
7. EP 549 Internship (6)

IV. Research and Statistics (15 credit hours)
1. STAT 531 Survey of Statistical Methods I (3) OR ITCE 561 Educational Statistics (3)
2. EP 655 Research in Psychoeducational Studies (6)
3. EP 505 Quasi-Experimental and Single Subject Design (3)
4. EP 500 Thesis or Problem in Lieu of Thesis (3)
V. Psychoeducational Core (33 credit hours)
1. SE 470 Psychology of the Exceptional Child (3)
2. CECP 570 Cross Cultural Counseling: Theory and Research (3)
3. PSY 461/561 Physiological Psychology (3)
4. EP 690 Psychopathology of Childhood (3)
5. EP 510 Psychological Theories of Human Development Applied to Education (3)
6. EP 650 Professional Practice in School Psychology (3)
7. EP 549 Internship (6)
8. Group Processes and Change Option
9. Family Studies Option
10. Social Basis of Behavior Option

VI. Field and practica experiences by semester

Years 1-3
Research in the schools or with children (75 hrs.)
EP 655 Research in Psychoeducational Studies (4-6)

First Year, Fall and Spring:
Knowledge, roles and functions (75 hrs.)
Second Year, Fall:
Introduction to consultation and intervention practices (50 hrs.)
Second Year, Spring:
Develop consultation skills (150 hrs.)
EP 546 Practicum in Consultation
Third Year, Fall and Spring:
Practice professional assessment skills (e.g., admin., inter., rept. writ.-75 hrs./sem.)
EP 542 Practicum in Assessment
Total: 425 hours structured field experience

Year 4, Fall and Spring:
EP 549 Internship (9) knowledge and skill development and mastery (1200-1500 hrs.)

DOCTOR OF PHILOSOPHY (Ph.D.)
Education major
School Psychology concentration

Every School Psychology student is expected to meet UT School Psychology Training Programs knowledge and skill requirements. Opportunities for students to meet these requirements will occur in the classroom and during field experiences. The School Psychology faculty, along with current and previous students, practica and internship supervisors, and various other groups who help ensure quality control within our training programs have contributed to the development of our curricula. Various accrediting and curricula oversight agencies (i.e., APA, NASP, SDE-Tennessee; UT Ph.D. Coordinating Committee; and UT Graduate Admissions) have their own specific goals and objectives. The School Psychology Handbook, published by the EP Department describes how the UT School Psychology Training Programs meet the goals and objectives of these various training groups. The UT School Psychology Program is designed to provide graded, sequential, and hierarchical training across the following areas a) Professional School Psychology, b) Consultation and intervention, c) Assessment, d) Research and Statistics, e) Psychoeducational Core, and f) Field Experience and Professional Practice.

I. Professional School Psychology (26 credit hours)
1. EP 540 Seminar in School Psychology (3)
2. EP 635 Ethical, Legal, and Professional Issues in Psychology (3)
3. ED 601 Transcollege Seminar (2)
4. EP 650 Professional Practice in School Psychology (9)
5. EP 649 Internship (9)

II. Consultation and Intervention (30 credit hours)
1. CECP 551 Theory and Practice of Counseling (3)
2. Group Processes and Change Option (3)
3. EP 515 Educational Applications of Behavioral Theories of Learning (3)
4. EP 517 Direct Assessment and Intervention for Academic Skills Deficits (3)
5. EP 545 Psychoeducational Consultation (3)
6. EP 546 Practicum in Consultation (3)
7. EP 516 Educational Applications of Cognitive Learning Theories (3)
8. EP 649 Internship (9)

III. Assessment (27 credit hours)
1. EP 517 Direct Assessment and Intervention for Academic Skill Deficits (3)
2. CECP 525 Formal Measurement in Education and Counseling (3)
3. EP 541 Psychoeducational Assessment (3)
4. EP 542 Practicum in Psychoeducational Assessment (3)
5. EP 541 Psychoeducational Assessment (3)
6. EP 542 Practicum in Psychoeducational Assessment (3)
7. EP 649 Internship (9)

IV. Research and Statistics (37-41 credit hours)
1. STAT 531 Survey of Statistical Methods I (3)
2. STAT 532 Survey of Statistical Methods II (3) OR ITCE 561 Educational Statistics (3)
3. ITCE 671 Advanced Educational Statistics (3)
4. EP 505 Quasi-Experimental and Single Subject Design Research (3)
5. EP 655 Research in Psychoeducational Studies (4-8)
6. EP 600 Dissertation (24)

V. Psychoeducational Core (48 credit hours)
1. SE 470 Psychology of the Exceptional Child (3)
2. PSYCH 420/565 History and Systems of Psychology (3)
3. CECP 570 Cross Cultural Counseling: Theory and Research (3)
4. PSYCH 461/561 Physiological Psychology (3)
5. EP 690 Psychopathology of Childhood (3)
6. EP 510 Psychological Theories of Human Development Applied to Education (3)
7. EP 650 Professional Practice in School Psychology (9)
8. EP 649 Internship (9)
9. Family Studies Option (3)
10. Curricula-Instruction Option (3)
11. Social Basis of Behavior Option (3)
12. Group Processes and Change Option (3

VI. Field and practica experiences by semester

Years 1-4:
Research in the schools or with children (75 hrs.).
EP 655 Research in Psychoeducational Studies (4-8)

First Year, Fall and Spring:
Knowledge, roles and functions (75 hrs.)
Second Year, Fall:
Introduction to consultation and intervention practices (50 hrs.)
Second Year, Spring:
Develop consultation skills (150 hrs.)
EP 546 Practicum in Consultation
Third Year, Fall and Spring:
Practice professional assessment skills (e.g., admin., inter., rept. writ.-75 hrs./sem.)
EP 542 Practicum in Assessment
Total: 425 hours structured field experience

Year 4, Fall and Spring:
Student developed plan (50-100 hrs)
EP 650 Professional Practice in School Psychology (3)
Total: 475 supervised field experience hours prior to internship
Counselor Education

GRADUATE COURSES

410 Gender Role Development: Implications for Education and Counseling (3) Theories and research of gender roles and their relevance to identity and behavior in socio-psychological, educational, and counseling settings. (Same as Women's Studies 410.)

431 Personality and Mental Health (3) Various perspectives of mental health with application to education and other social institutions.

500 Thesis (1-15) P/NP 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.


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.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only.

525 Formal Measurement in Education and Counseling (3) Principles of test construction and item analysis. Survey of standardized tests of intelligence, achievement, aptitude, vocational interest, attitudes and personality. Prereq: 520 or equivalent.

535 Ethical, Legal, and Professional Issues in Counseling (3) Professional practice issues in school and community counseling and related fields: education, research, standards of practice, credentialing, and policy. Prereq: Admission to counseling program or consent of instructor.

550 Introduction to Pupil Personnel Programs (3) History, philosophy, professional standards, counselor role in relation to school staff and mental health professionals, and ethics of profession.

551 Theory and Practice of Counseling (3) Philosophical bases of helping relationships; development of counselor and client self-awareness; counseling theory/techniques.

552 Career Development: Vocational Theory, Research and Practice (3) Relationship of vocational theory, career development research and societal factors to life career roles.

553 Career and Educational Information Systems and Resources (3) Use of print and non-print materials: computer-based systems, for career and educational planning. Prereq: 552 or consent of instructor and Internet access account.

554 Group Dynamics and Methods (3) Theory and types of groups, descriptions of group practices, methods, dynamics, and facilitative skills, supervision of leadership skills. (Same as Psychology 567.)

555 Practicum in Counseling (3) Supervised practicum and application of counseling skills with individual clients. Prereq: Admission to program, 451, 525, 551 and consent of instructor. May be repeated. Maximum 6 hrs. (Same as Psychology 567.)

556 Orientation to Mental Health Counseling (3) Mental health counseling as profession: professional organizations, roles and settings, code of ethics, certification requirements, and role identity.

558 Internship in School Counseling (1-6) Supervised postpracticum employment at academic unit approved site. Prereq: 550 and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only.

559 Internship in Mental Health Counseling (1-6) Supervised postpracticum employment at academic unit approved human services agency. Prereq: Admission to counseling programs 555 and consent of instructor. May be repeated. Maximum 12 hrs. Satisfactory/No Credit grading only.

561 Development and Operation of School Counseling Programs (3) Management of comprehensive school counseling programs to include needs assessment, program goals, resource identification, evaluation, and use of computer-based program management software. Prereq: 550.

565 Facilitation of Technical Task Groups (3) Technical 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 Counseling (3) (Same as Child and Family Studies 566.)

570 Cross-Cultural Counseling: Theory and Research (3) Theory and research on issues and problems in counseling of clients from different cultural backgrounds in U.S. and abroad. (Same as Psychology 574.)

580 Case Management Process in Mental Health Counseling (3) Introduction and application of knowledge and skills of the case management process: assessment, planning, and service provision. Prereq: Consent of instructor.

585 Seminar in Gerontology (1) (Same as Educational Psychology 585; Exercise Science 585; Health 585; Nursing 585; Public Health 585; Social Work 585; Sociology 585.)

593 Independent Study (1-3) May be repeated. S/NC or letter grade.

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

602 Directed Research (1-3) Instructor- or student-initiated group investigation of empirical and theoretical problems in educational and counseling psychology. May be repeated. Maximum 12 hrs. S/NC only.

604 Special Topics (1-3) Instructor-initiated courses offered at convenience of academic unit on topics of current interest. May be repeated. Maximum 15 hrs. S/NC or letter grade.

625 Advanced Study in Personality (3) (Same as Psychology 625.)

635 Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Educational Psychology 635.)

650 Seminar in Counselor Education (3) Professional issues related to role and function of counselor educator. Prereq: Admission to doctoral program in counselor education. May be repeated. Maximum 2 hrs. S/NC only.

655 Practicum in Counselor Education (3) Supervised practice and application of counseling skills with clients. Prereq: Admission to counselor education program and consent of instructor. May be repeated. Maximum 6 hrs.

660 Advanced Theory and Practice of Counseling (3) An in-depth exploration of theories of human nature and the practice of counseling. Prereq: Admission to the Ph.D. program or permission of instructor.

665 Group and Systems Theory and Interventions (3) Exploration of group and family systems theory, preparation as practitioners in facilitation of counseling and task groups, and examination of counseling and psychotherapy interventions applicable to group dynamics. Prereq: Admission to the Ph.D. program or permission of instructor.

670 Theory and Practice of Counseling Supervision and Consultation (3) Theory of counseling supervision and evaluation, supervision of entry-level counselors, and agency consultation. Prereq: Admission to the Ph.D. program or permission of instructor.

671 Personality and Vocational Assessment (3) (Same as Psychology 667.)

675 Theory and Practice of University Teaching In Counselor Education (3) Emphasis on teaching and learning theories and classroom applications in the preparation of future mental health, school, and rehabilitation counselors. Prereq: Admission to the Ph.D. program or permission of instructor.

693 Independent Study (1-3) May be repeated. S/NC or letter grade.

Educational Psychology

GRADUATE COURSES

432 The Disadvantaged Student: Psychoeducational Perspectives (3) Theory and research regarding etiology, psychosocial behavior and appropriate interventions.

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/NC or letter grade.

500 Thesis (1-15) P/NP 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.


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/NC or letter grade.

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.

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.

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.

513 Reflective Practice in Education and Psychology (3) Concepts, theories and processes of reflective practice applied to educational settings.

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.

515 Educational Applications of Behavioral Theories of Learning (3) Behavioral theories and research on conditioning, observational learning, and ethological learning as systems to apply to student motivation, discipline and learning.

516 Educational Applications of Cognitive Learning Theories (3) Cognitive theory and research, social learning, attribution and information processing as applied to education.

517 Direct Assessment and Interventions for Academic Skills Deficits (3) Theory, techniques and procedures shown to prevent and remedy academic skills deficits: curriculum-based assessment and direct intervention procedures.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only.

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.
Program Development and Operation in Adult Education (3) Theories and methods from research to practice in planning and operating adult education programs. Prereq: Consent of instructor.

Adult Development (3) Theory and research in adult development over lifespan and its implications for adult learning in formal and informal contexts.

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.

Continuing Professional Education (3) Theories and concepts supporting design and management of educational programs for adults in professions. Prereq: Consent of instructor.

Characteristics of Adult Learners (3) Key characteristics of adult learners, current theory and research on adult learning, and implications for teaching and learning concepts.


Controversies in Adult Education (3) Controversies in adult education; development of critical analysis skills by looking at controversies from different perspectives.

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 policy.

Facilitating Adult Learning (3) Theory, research, and practice related to working with adults in teaching lifelong situations.

Methods of Collaborative Inquiry (3) Philosophical and theoretical frameworks for designing and conducting collaborative inquiry projects. Practice in conducting research.

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.

Psychoeducational Assessment (3) Direct, psychometric and naturalistic assessment methods in learning situations. 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.

Practicum in Psychoeducational Assessment (3) Appraisal of assessment skills to clients in learning environments. Coreq: 541 or consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

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.

Practicum in Consultation (3) Application of consultation skills to educational settings. Prereq: 545.

Internship in School Psychology (1-6) Supervised professional practice in approved school psychology internship sites. Prereq: Enrollment in school psychology program and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only.

Statistics and Research Design: Conceptual (5) Consumer-oriented, conceptual treatment of statistical, research design, and quantitative basis of testing

Discipline and Conflict Resolution (3) Applications of major models of discipline and conflict resolution strategies in development of constructive atmosphere for classroom learning.

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.

Meeting Needs of Nontraditional and Underachieving Learners (3) Exploration of students' needs at any age and level of functioning who are not progressing 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.

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 theory. Needs of individuals and groups involved in change and roles of inside and outside change agents.

Seminar in Gerontology (1) (Same as Counselor Education 585; Exercise Science 585; Health 585; Nursing 585; Public Health 585; Social Work 585; Sociology 585.)

Independent Study (1-3) May be repeated. S/NC or letter grade.

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

Directed Research (1-3) Instructor- or student-initiated group investigation of empirical and theoretical problems in educational and counseling psychology. May be repeated. Maximum 12 hrs. S/NC only.

Special Topics (1-3) Instructor-initiated courses offered at convenience of unit on topics of interest. May be repeated. Maximum 15 hrs. S/NC or letter grade.


Advanced Seminar in Program Planning (3) Concepts, principles, and theories related to program planning in adult education. Prereq: 521 or equivalent.

Advanced Seminar in Adult Development and Learning (3) Adult development and adult learning theory and research. Prereq: 522, 525, or equivalent.

Doctoral Seminar in Collaborative Learning (3) Issues, theories, concepts in research and collaborative learning. Prereq: Admission to Ph.D. in Education. Coreq: 522, or equivalent. Instructor-initiated group investigation of empirical and theoretical problems in educational and counseling psychology. May be repeated. Maximum 12 hrs. S/NC or letter grade.

Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Counselor Education and Counseling Psychology 635.)

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/NC only.

Advanced Internship in School Psychology (1-9) Supervised experience as school psychologist in college, supervised 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/NC only.

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. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

Research in Psychoeducational Studies (1) Data analyses, collection, and interpretation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.


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. Prereq: Counselor Education and Counseling Psychology 525, and two-course sequence in statistical analysis.

Analysis of Research in Instructional Technology (3) Research on human learning, design of learning environments. Analysis of teacher behavior, test development, computer software design and video presentations.

Practicum in Instructional Planning (3) Development and management of course or program of instruction in educational psychology. Prereq: 665, or consent of instructor.

Internship in Educational Psychology (1-6) Supervised employment in unit approved educational psychology internship sites. May be repeated. Maximum 12 hrs. S/NC only.

Mediated Learning Theory (3) Feuerstein's theory of mediated learning experience and its connections to work of Piaget, Vygotsky and others. Implications for transformational learning and building of learning communities for learners of all ages. Prereq: Admission to doctoral program or consent of instructor.

Collaborative Learning (3) Theories of collaborative learning and research related to facilitating collaborative learning in professional practice settings. Prereq: 513 and 671 or consent of instructor.

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.

Independent Study (1-3) May be repeated. S/NC or letter grade.

Rehabilitation Counselor Education

GRADUATE COURSES

Orientation to Rehabilitation (3) History, philosophy, legal and economic bases, current issues, and practices in public and private rehabilitation programs and facilities. Prereq: Consent of instructor. May be repeated. May be applied to work of Piaget, Vygotsky and others. Implications for mediated learning experience and its connections to work of Piaget, Vygotsky and others. Implications for transformational learning and building of learning communities for learners of all ages. Prereq: Admission to doctoral program or consent of instructor.

Collaborative Learning (3) Theories of collaborative learning and research related to facilitating collaborative learning in professional practice settings. Prereq: 513 and 671 or consent of instructor.

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.

Independent Study (1-3) May be repeated. S/NC or letter grade.
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 in private sector rehabilitation.

541 Psychosocial Aspects of Disability (3) Psycho-social impact of disability on person and family. Reaction to loss, coping with disability, and societal rehabilitation.

543 Medical Aspects of Disability (3) Etiology and clinical symptoms related to disabling conditions served by special education and rehabilitation personnel. Restrictive measures to eliminate or minimize resulting handicaps. Skills necessary to communicate with lay and professional persons.

545 The Rehabilitation Interview (3) Interview as used in assessment and planning with people who have disabilities and vocational handicaps.

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.

592 Assistive Technology in Rehabilitation (3) Technology as applied to needs of school age and post-secondary age students/clients. Delivery of assistive technology services; software programs and assistive devices; delivery systems, interdisciplinary evaluation/planning, and funding issues.

593 Independent Study (1-3) May be repeated. S/NC or letter grade.

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Electrical and Computer Engineering (College of Engineering)

MAJOR DEGREES

Electrical Engineering M.S., Ph.D.

Samir El-Ghazaly, Head

Professors:
Abidi, Mongi A., Ph.D. ------------ Tennessee
Birdwell, J. Douglas, Ph.D.---------- MIT
Bomar, Bruce W. (UTSI), Ph.D. .... Tennessee
Bouldin, Donald W., Ph.D. ......... Vanderbilt
Lawler, J. S., Ph.D. ............... Michigan State
Pace, Marshall O. (Liaison), PE, Ph.D. ----------- Georgia Tech
Ph.D. ........................................... Cornell

Associate Professors:
Crilly, Paul B., Ph.D. .............. New Mexico State
Islam, Syed, Ph.D. .................. Connecticut
Koch, Daniel, Ph.D. .............. Missouri (Rolla)
Kong, Seong-Gen, Ph.D. .......... Southern Cal
Smith, L. Montgomery (UTSI), Ph.D. -------------- Tennessee

Assistant Professors:
Chiasson, John, Ph.D. ............ Minnesota
Howlader, Mostofa, Ph.D. ......... Virginia Tech

Peterson, Gregory, Ph.D. .......... Washington (St. Louis)
Qi, Hairong, Ph.D. ............... NC State
Smith, Philip W. .................... Virginia
Tolbert, Leon, Ph.D. .............. Georgia Tech

Emeriti Faculty:
Alexeff, Igor, Ph.D. ............... Wisconsin
Bodemer, B., Ph.D. .............. Northwestern
Bose, Bimal K., Ph.D. ............. Calcutta
Gonzalez, R. C., Ph.D. .......... Florida
Green, Walter L., Ph.D. .......... Texas A and M

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, electromagnetic, electro-optics, image processing, information processing, intelligent control, microelectronics, mixed-signal VLSI, monolithic sensors, plasma engineering, power electronics and systems, sensor fusion, and signal processing.

The department sustains a strong joint program in mixed-signal VLSI and monolithic 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 Departmental Graduate Committee is responsible for administering, promoting, and advancing the general well-being of the graduate program. Departmental actions regarding a graduate student may be appealed in writing, first to the departmental graduate committee and then to the department faculty.

THE MASTER’S PROGRAM

Graduate work leading to the Master of Science with a major in Electrical Engineering may be completed during one academic year of full-time study, or two to three years of part-time study.

Admission Requirements

Applicants for admission to the M.S. degree program are expected to have completed a bachelor degree in Electrical Engineering with a minimum of 3.0 out of 4.0 both overall and in the senior year. All applicants whose native language is not English, including those who have earned degrees at U.S. institutions, must score at least 550 on the TOEFL exam to be considered for admission to the program.

Students who hold the bachelor’s degree in a field other than electrical engineering are also expected to have a minimum cumulative grade-point average of 3.0 and a minimum senior year average of 3.0 in that field. The department will require that selected undergraduate courses be taken to make the background of these students comparable to that of students who hold a bachelor’s degree in Electrical Engineering. These undergraduate courses may include electrical engineering courses from the sophomore and junior years and one senior electrical engineering sequence of the student’s choice. The specific set of undergraduate courses required will be chosen in view of the applicant’s prior education and experience. The student will be admitted under non-degree status until the required undergraduate courses are successfully completed with a 3.0 average.

Master’s Degree Requirements

Students may choose between a thesis option and a project (non-thesis) option M.S. program. All students must file a Master’s Program Plan with the departmental graduate committee specifying which option they have selected, a semester-by-semester schedule of the courses they intend to take, and the members of the student’s master’s committee. Students may change between the thesis and project options, one time, by filing an amended Master’s Program Plan.

Thesis Option: Specific requirements of the thesis option are a minimum of 30 semester hours including:

1. Electrical Engineering 503 and 504.
2. Six semester hours of mathematics at the 400 level or above selected from a list approved by the graduate committee, or 6 semester hours of EE courses at the 500 level or above, or 6 semester hours of non-EE courses approved by the student’s master’s committee and the graduate committee.
3. An additional 12 semester hours of 500-level work in electrical engineering including 6 semester hours in the student’s major area of electrical engineering and 6 semester hours in a second area of electrical engineering approved by the student’s master’s committee.
5. A final oral examination covering the thesis and related coursework.

Non-Thesis Option: Specific requirements of the project (non-thesis) option are a minimum of 33 semester hours including:

1. Electrical Engineering 503 and 504.
2. Six semester hours of mathematics at the 400 level or above selected from a list approved by the graduate committee, or 6 semester hours of EE courses at the 500 level or above, or 6 semester hours of non-EE courses approved by the student’s master’s committee and the graduate committee.
3. An additional 18 semester hours of 500-level work in electrical engineering 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, computers, electronics, communication theory, electromagnetic theory, plasma engineering, power systems, solid-state electronics, power electronics, and control systems.

Applicants are required to submit scores on the General Graduate Record Exam. A TOEFL score of 550 is required for non-native speakers of English, including those who have earned degrees at U.S. institutions. Specific departmental requirements for the Ph.D. include the following:

1. A Master of Science or Master of Engineering degree.
2. A minimum of 24 semester hours of coursework beyond the Master's, excluding research and dissertation credit. These hours must include:
   a. A minimum of 12 semester hours in electrical engineering at the 500 and 600 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 research efforts.
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 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 entrolls in the Ph.D. program. The 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.
5. 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 at least two sections: a complete review of the literature in the student's dissertation topic, and a review of the major tools to be used in the dissertation work. The student's committee may require additional written sections. The students must demonstrate a mastery of the dissertation area, ability to think analytically and create new 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.
6. 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.


432 Electronic Amplifiers (4) Feedback amplifier principles; wideband linear amplifier design, low-noise preamplifier design, radio power amplifier design, linear regulated power supply design and switching regulator principles. Radio frequency amplifier design; frequency synthesizers. Laboratory experiments on design projects. Level 2 design projects which require laboratory work. Prereq: 316, 325 Electric Energy System Components, 324 Communications.

433 Electronic Amplifiers (4) Feedback amplifier principles; wideband linear amplifier design, low-noise preamplifier design, radio power amplifier design, linear regulated power supply design and switching regulator principles. Radio frequency amplifier design; frequency synthesizers. Laboratory experiments on 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, spreadspectrum, codes, pulse and bandwidth analysis, binary communication in presence of noise, matched filtering and equalization, bandpass digital transmission, introduction to multiple access techniques. Level 1 design projects. Prereq: 342 Communications.


446 Electromagnetic Compatibility (3) Principles and practices to avoid interference among and within electrical devices. Parameters and coupling for dipole, biconical, and log-periodic antennas. High frequency effects in circuit elements. Radiated and conducted emissions and susceptibility. Crosstalk, shielding, electrostatic discharge, and EMC regulations. Level 1 design projects that require laboratory work. Prereq: 316 Signals and Systems II, 341 Fields, 342 Communications.

451 Computer Systems Architecture (3) Architecture and design of microcomputer systems with microprocessors or microcontrollers. Introduction to set architecture, computer hardware, software interfaces, processor structures, memory hierarchy, interfacing. Level 1 design projects that require laboratory work. Prereq: 335 Computing System Fundamentals.

452 Design of Digital Systems and Computers (4) Considerations for design and application of digital systems and computers: embedded systems concepts and design, CPU issues, interrupt structures, and I/O channels. Level 3 projects that require laboratory work. Prereq: 206 Electrical Engineering Computations.

471 Introduction to Pattern Recognition (3) Statis-tical 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 Signals and Systems II, non-majors require consent of instructor.

472 Introduction to Digital Image Processing (3) Mathematical foundations and practical techniques for digital image processing and image enhancement. Manipulation, restoration, compression, segmentation, and color image processing. 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 semiconductor devices, single-phase and polyphase phase controlled converters, converters and power management concepts and laboratory work. Level 1 design projects. Prereq: 316 Signals and Systems II, 325 Electric Energy System Components, 332 Electronic Circuits.


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. Level 1 design projects that 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/N/C or letter grade.

500 Thesis (1-15) P/N only.
501 Project in Lieu of Thesis (3) Capstone course taken under supervision of student’s major professor and master’s committee. Individual project involving literature survey, development of some software/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 only.


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 density 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 dynamic 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: 519.

521 Power Systems Analysis I (3) Matrix-vector representations of power networks, sequence modelling of power system components, unbalanced shunt 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 stability, and dynamic performance of synchronous and stochastical problems in matrix-vector form with application to large scale power systems. Prereq: 521.

523 Power Electronics and Drives (3) Forced commutated inverters, advanced PWM techniques, current-fed inverters and drives, induction motor 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 device theory of operation of modern electronic devices; and laboratory. Prereq: 431, 432, or consent of instructor.


541 Electromagnetic Fields (3) Maxwell’s equations, special relativity, wave reflection and transmission, generalized media, guided waves, radiation from current elements. Prereq: Mathematics 404.


545 Introductory Microwave Networks and Components (3) Scattering and transfer representation for microwave circuits; unilateral and bilateral microwave and millimeter wave devices. Component and system parameter measurement by modern network analyzers. Electronic oscillators and amplifiers, frequency sweeps, oscillators, transit time devices, parametric devices, mixers, switches.


561 Plasma Diagnostics I (3) Principles of active, passive, perturbing and nonperturbing diagnostic methods, including microwave, light, and ultrasonic measurements, microwave, light, and ultrasonic measurements. Oscillator spectral line, shape for resonant cavities, steady-state and Q-switched operation. Laser modulation and detection. Laser emission spectroscopy, optical harmonic generation, holography, metal-working, and biological and medical uses. Prereq: 581.


598 Graduate Seminar (1) Topics of interest discussed in weekly seminar. May be repeated. Maximum 6 hrs. S/NC or letter grade.

599 Special Topics (1-3) May be repeated. Maximum 9 hrs.

600 Doctoral Research and Dissertation (3-15) Pr/NoP.

614 Optimal Control (3) Deterministic and stochastic dynamic programming in continuous and discrete time, minimum principle and matrix minimum principle, 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: 617.

623 Advanced Power Electronics and Drives (3) Phase-controlled cycloconverters, cycloconverter-fed ac drives, used for synchronous machines, vector and scalar control of synchronous machines, static Kramer drives, static Scherbius drives, VSFC 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 electrical and non-electrical parameters. Analysis of optical, acoustics, and bridges; associated statistics and distributed parameter effects. Case studies drawn from active research, power systems, electronic circuitry, and devices. 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 and measurement, and their use in hybrid, electric, electronic, electromagnetic, 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. Prereq: 511 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. Magnetohydrodynamics 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) Stereovision, 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/NC or letter grade.

692 Special Topics (1-3) Advanced topics of current interest. Must be taken in sequence. Prereq: 692.

693 Advanced Topics of Current Interest (1-3) Advanced topics of current interest. Must be taken in sequence. Prereq: 693.

694 Advanced Graduate Seminar (1) Research in department. May be repeated. S/NC or letter grade.

802 Special Topics (1-3) Advanced topics of current interest. Must be taken in sequence. Prereq: 693.

The master's program with writing concentration is intended for those students who plan to do free-lance writing, specialize in teaching writing courses at the college level, or work as professional writers in business or industry.

THE MASTER'S PROGRAM

Requirements

Coursework: A minimum of 24 semester hours in English beyond the B.A., to include 6 hours at the 600 level; 12 additional hours at the 500-600 level (Only 3 hours of 593 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.

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 free-lance writing, specialize in teaching writing courses at the college level, or work as professional writers in business or industry.
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. All other 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) in option 1. for one foreign language; and completion of 6 semester hours in English language courses with grades of B or better, at least three of which must be from English 508 or 509 History of the English Language (offered in alternate years, every other year). For the other 3 hours, the student may either complete the history of the language sequence or choose one other course in language taught in the Department of English at the 500 or 600 level and approved by the Director of Graduate Studies in English. These courses will not count toward the minimum number of courses for the Ph.D., and anyone electing this language option may not take the comprehensive examination in linguistics.

Examinations: (1) A 4-hour qualifying examination taken before the end of the first year of Ph.D. coursework; the examination is given three times a year, with the M.A. written examination. (2) A comprehensive written examination which may be divided as the department directs; see the English Department graduate brochure. The comprehensive examination is given twice a year, normally in March and September. Before a student may take it, he/she must have completed all coursework required. A student must also have met all requirements for foreign languages before beginning the first part of the examination.

Dissertation Defense: A one-hour examination on the dissertation and other related areas.

Residence Requirement: Two consecutive semesters as a full-time student. For students not on teaching assistantships, full-time consists of 9 or more hours of coursework and/or dissertation hours each semester. For students on assistantships, full-time consists of at least 6 hours of courses and/or dissertation hours and 3 hours of teaching each semester.

GRADUATE COURSES

Note: Students enrolling in English graduate courses must first register in the office of the Director of Graduate Studies in 306 McClung Tower.

401 Medieval Literature (3) Reading and analysis of selected medieval literary masterpieces in modern English.

402 Chaucer (3) Reading and analysis of Canterbury Tales and Troilus and Criseyde in Middle English.

404 Shakespeare I: Early Plays (3) Shakespeare's dramatic achievement before 1601. Reading and discussion of selected plays from romantic comedies, including Troilus and Cressida; English histories, including Henry IV, and the tragedy, including Hamlet.

405 Shakespeare II: Later Plays (3) Shakespeare's 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 1589 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 Browning; prose by Carlyle, Newman, and Mill.

419 Later Victorian Literature (3) May include poetry 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 Langrish, 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 the 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 humo-rists, local color writers, and Southern literary renais-sance.

442 American Humor (3) Early nineteenth century into twentieth century: Mark Twain.
Enomtology and Plant Pathology

(College of Agricultural Sciences and Natural Resources)

MAJOR

Entomology and Plant Pathology .......... M.S.
Plants, Soils, and Insects ................. Ph.D.

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
Jones, Carl J., Ph.D. ....................... Wyoming
Lambdin, Paris L., Ph.D. ................. VPI
Newman, Melvin A., Ph.D. .............. Texas A and M
Patrick, Charles R., Ph.D. ............... Georgia
Trigiano, Robert 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 A., Ph.D. ..................... Ohio State
Lentz, Gary L., Ph.D. ..................... Iowa State
Owney, Bonnie H., Ph.D. ................. NC State
Skinner, John A., Ph.D. ................. California (Davis)
Stewart, S. D., Ph.D. ..................... Auburn
Vail, Karen M., Ph.D. .................... Florida

Assistant Professors:

Lamour, K. H., Ph.D. ...................... Michigan State
Moulton, J. K., Ph.D. ..................... Arizona

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 have completed (1) general botany or biology, 8 hours; (2) advanced biological sciences, 8 hours; (3) general inorganic chemistry, 6-8 hours; (4) advanced organic chemistry, 3 hours. In addition, three certified ratings 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.

THE DOCTORAL PROGRAM

A Ph.D. in Plants, Soils and Insects (PSI), with concentrations in entomology, plant pathology, integrated pest management and bioactive natural products, is offered under a multi-departmental doctoral program. Three departments participate: Plant Sciences, Entomology and Plant Pathology, and the faculty in Biosystems Engineering and Environmental Sciences. Other concentrations within the PSI major include horticulture, crop sciences, weed biology, plant improvement, and environmental and soil sciences. Please see the doctoral program links on the homepage of the Department of Entomology and Plant Pathology for additional information, http://eppserver.ag.utk.edu/, or contact a faculty member in the area of interest.

Admission Requirements

Submit application, fee, official transcripts, and scores from the General Part of the Graduate Record Examination to the Graduate Admissions Office. In your application, indicate that you are applying to the Plants, Soils and Insects doctoral program. Submit resume, three letters of reference (or three Graduate Rating Forms), photocopied of GRE scores and a short statement of professional goals and reasons for applying to EPS PhD Program Coordinator, Department of Entomology and Plant Pathology, 2431 Center Drive, 205 PSB, University of Tennessee, Knoxville, Tennessee, 37996-4560. In your statement letter and application, please indicate your concentration of interest and intended major professor.

Degree Requirements

To obtain the doctorate, the student must meet the following requirements:

1. The student and the major professor will select a minimum of three additional faculty, holding the rank of assistant professor or above, to serve on the student’s doctoral committee. The major professor and two committee members must be approved to direct doctoral research by the Graduate Council, and at least half of the committee must hold teaching appointments. At least one member of the committee must be from outside the department. The doctoral committee must be formalized by the end of the second semester of graduate study.

2. Submission of an approved program of study by the end of the second semester of graduate study. A candidate for the doctoral degree must complete a minimum of 24 hours of graduate coursework numbered 503 or higher beyond the master’s degree.
Candidates not having a masters degree must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree, 24 hours of which must be numbered 503 or higher. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A.F. At least 6 of the student’s coursework must be from outside the PSI major, and a minimum of 6 semester hours must be taken in UT courses numbered 601 or higher. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.

3. Satisfactory preparation of a written dissertation proposal and its oral defense to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 600.

4. Passing both written and oral sections of the comprehensive examination. The candidate will be tested on his/her knowledge of the proposed dissertation and related fields.

5. Presentation of at least two departmental seminars (2 hours of EPP 541), in addition to an exit seminar (no credit).


Please see the Degree Program Requirements/Doctoral Degrees section at the front of this catalog for additional information.

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.

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester who 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 Plant Disease Fungi (4) Morphology, taxonomy, biology, and genetics of plant pathogenic fungi. Isolation and identification of plant pathogenic fungi. Prereq: 313 or consent of instructor. 2 hrs and 2 labs. (Same as Ornamental Horticulture and Landscape Design 511.)

512 Soilborne Plant Pathogens (3) Causal agents; host-parasite-soil environment interactions; epidemiology; and biological, cultural, and chemical control. Prereq: Plant Pathology or consent of instructor.

514 Bacterial Plant Diseases (4) Morphology, taxonomy, ecology, physiology, and genetics of bacterial plant pathogens; infection and disease development, pathogenesis and resistance; diagnosis, detection, effect of environment, and management of bacterial plant diseases; beneficial plant-bacterial interactions. Prereq: Plant Pathology or consent of instructor. 3 hrs and 1 lab.

515 Physiology of Plant Disease (3) Biochemical and physiological events involved in host-pathogen interactions. Mechanisms of disease resistance. Prereq: Introductory plant physiology and pathology, or consent of instructor.

520 Plant Parasitic Nematodes (4) Morphology, physiology, taxonomy, ecology, and management of plant parasitic nematodes, host-parasite relationships. Prereq: 6 hrs biological science or consent of instructor. 2 hrs and 2 labs.

521 Plant Virology (3) Symptomatology, epidemiology, and management of virus infection; structure, morphology, replication, transmission, purification, characterization, and classification of plant viruses; serology; plant pathogenic viroids, mycoplasmas and spiroplasmas. Prereq: 313 or consent of instructor. 2 hrs and 1 lab.

523 Field Crop and Vegetable Insects (2) Identification, biology and management of insects affecting commercial vegetable and home garden crops. Prereq: 321 or basic entomology course. 1 hr and 1 lab.

525 Medical and Veterinary Entomology (3) Morphology, taxonomy, biology and control of arthropod parasites and vectors of pathogens of humans and animals. Ecology and behavior of vectors in relation to pathogen transmission and control. Prereq: 321 or 325, or consent of instructor. 2 hrs and 1 lab.

530 Integrated Pest Management (3) Principles and application of biological, cultural, genetic, behavioral, and chemical methods of control to maintain pest populations below economic threshold levels. Prereq: 321, or consent of instructor. (Same as Plant and Soil Science 530.)

531 Special Problems in Entomology (1-3) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs.

532 Special Problems in Plant Pathology (1-4) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs.

533 Concentrated Study in Entomology (1-3) Selected subjects in entomology for advanced students, concentrated in time and subject matter. Prereq: 321 or basic entomology course. May be repeated. Maximum 6 hrs.

541 Seminar (1) Review of literature and current research in entomology and plant pathology. May be repeated. Maximum 2 hrs.

543 DNA Analysis (2) Practical experience in isolating and analyzing DNA from prokaryotic and eukaryotic organisms, amplification of DNA using arbitrary nucleotide primers. DNA profiling techniques (DAF, ASAP, ITS ribosomal DNA and 16S bacterial gene) isolation and purification of amplified products. Data collection and analysis of relationships between organisms. Prereq: 12 hrs biological sciences, 8 hrs chemistry, written consent of instructor, 1 hr and 4 labs weekly for 7 weeks. (Same as Plant Sciences and Landscape Systems 543.)

544 Protein Gel Electrophoresis (1) Practical experience with isolating native and denatured proteins from plants and fungi, determining protein concentrations, PAGE of proteins including total proteins and assays for specific enzymes (isozyme) analyses. Prereq: 8 hrs biological/botanical sciences, 8 hrs chemistry, consent of instructor. 1 hr and 4 labs weekly for 5 weeks. (Same as Plant Sciences and Landscape Systems 544.)

545 Plant Microtechnique (1) Practical light and scanning electron microscopy methods for investigating aspects of plant development, histochemistry and pathological structures in ornamental forest and crop species. Prereq: 8 hrs biological/botanical sciences and consent of instructor. 1 hr and 4 labs weekly for 5 weeks. (Same as Plant Sciences and Landscape Systems 545.)

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

602 Advanced Topics in Entomology (1-3) Morphology, systematics, physiology, ecology and genetics of arthropods, apiculture, medical and veterinary entomology, insect biodiversity, and insect pathology. May be repeated. Maximum 12 hrs.

604 Advanced Topics in Plant Pathology (1-3) Biological control, disease diagnosis and management, epidemiology, fungal plant pathogens, integrated pest management, molecular plant-microbe interactions, nematology, plant pathogenesis, plant pathology, bacteria, soil- and seed-borne pathogens, and virology. May be repeated. Maximum 12 hours.

606 Advanced Topics in Bioactive Natural Products (1-3) Bioactive pesticides, ethnobotany and paleoethnobotany, ethnomedicine, biocatalysis of plant pathogens, bioprospecting, natural product diversity, alternative bioactive crops, organic agriculture, allelopathy in agriculture, regulatory issues in natural product development, and bioactivity-guided isolation. May be repeated. Maximum 12 hours.

608 Advanced Topics in Integrated Pest Management (1-3) Selected issues and topics of current significance to integrated pest management: transgenic in agriculture, issues in biological control, pest resistance management, ethics in pest management, environmental manipulations, epidemiology of plant diseases, biological control of plant pests, induced plant resistance, plant-microbe interactions, and new pesticide chemistries. Prerequisite: 530 or consent of instructor. May be repeated. Maximum 12 hrs.

Environmental Engineering

See Civil Engineering

Finance

(College of Business Administration)

MAJOR DEGREES

Business Administration .......... MBA, Ph.D.

James W. Wansley, Head

Professors:

Black, Harold A. (James F. Smith, Jr., Professor), Ph.D.
Boehm, Thomas P. (AmSouth Scholar), Ph.D.
DeGennaro, Ramon P., Ph.D.

Ehrhardt, Michael C. (Castagna Professor), Ph.D.
Philippatos, George C. (Distinguished Professor), Ph.D.
Shriever, Ronald E. (Voight Professor), Ph.D.
Wachowicz, John M., Jr. (AmSouth Scholar), CPA, Ph.D.

E. Wansley, James (Clayton Homes Chair of Excellence) (Liaison), CFA, Ph.D.

Iowa

Associate Professors:

Auxier, Al L., Ph.D.
Collins, M. Cary (Home Federal Fellow), Ph.D.
Daves, Philip R., Ph.D.
Murphy, Deborah L., Ph.D.

Emeriti Faculty:

Dottenweich, William W., Ph.D.
Pennsylvania

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 plus two from the following: 512, 525, 532, 581, and 599 (Torch Fund only).

Ph.D. Concentration: Finance.

Minimum course requirements are finance seminars 641, 651, 652, and 654.

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.

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 restructuring. 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-world 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 economies 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.

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.


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: 641 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.

**Clara J. Brekke, Head**

**Professors:**

Brekke, Clara J., Ph.D. ................. Wisconsin

Davidson, P. Michael, Ph.D. ............... Wisconsin

Draughon, F. Ann, Ph.D. .................. Georgia

Drake, James L., Ph.D. ...................... Illinois

Fare, Robert J., Ph.D. ....................... Wisconsin

**Associate Professors:**

Glen, David A. (Liaison), Ph.D. .......... Kentucky

Hedrick, B. Wayne, Ph.D. ................. Ohio State

Penfield, Marjorie P., Ph.D. ............ Tennessee

**Assistant Professors:**

Weiss, Jochen, Ph.D. ...................... Massachusetts

Zivanovic, Svetlana, Ph.D. ............... Arkansas

**Emeriti Faculty:**

Collins, Jim L., Ph.D. ..................... Maryland

Jaynes, Hugh O., Ph.D. .................. Illinois

Melnik, Sharon L., Ph.D. .................. Tennessee

Miles, James T., Ph.D. ..................... Wisconsin

The Department of Food Science and Technology offers the Master of Science and Doctor of Philosophy degrees. Students in the doctoral program may choose research in the concentration areas of food processing, food chemistry, food microbiology or sensory evaluation of foods. Commodity interests (meats, dairy, fruits, vegetables, bakery products) can be emphasized in any of the areas by careful selection of courses and the research topic. Minors are available in cognate fields. For detailed information, contact the department.

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. Students working on a problem must register for 6 hours of 503.

2. In addition to the requirement for 6 hours of 503, a minimum of 24 semester hours of graduate coursework is required. This work must be approved by the student's committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student's progress or background indicates such need.

3. All students are required to take 2 hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master's program. Completion of 510 or equivalent is also required.

4. Students will be required to take a written comprehensive examination covering their coursework. In addition, an oral, final examination covering the problem and coursework is required. The oral examination will be held on the Knoxville campus.

**THE DOCTORAL PROGRAM**

1. Completion of a master's degree in the field, or a closely related field, or passing a special qualifying examination is required for admission.

Forestry, Wildlife and Fisheries

(College of Agricultural Sciences and Natural Resources)

MAJORS

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George M. Hopper, Head

Professors:
- Dearden, B. L., Ph.D. ............ Colorado State
- Hill, T. K., Ph.D. ................. Auburn
- Hopper, G. M. (Liaison), Ph.D. ... Virginia Tech
- Ostermeier, D. M., Ph.D. ......... Syracuse
- Pelton, M. R., Ph.D. .............. Georgia
- Rials, Timothy G., Ph.D. ......... Virginia Tech
- Schlarbaum, S. E., Ph.D. ......... Colorado State
- Speer, C. A., Ph.D. ............... Utah State
- Strange, R. J., Ph.D. ............. Oregon State
- Wilson, J. L., Ph.D. .............. Tennessee

Associate Professors:
- Buehler, D. A., Ph.D. ............ Virginia Tech
- Clark, J. D., Ph.D. ............... Arkansas
- Clatterbuck, W. K., Ph.D. ....... Mississippi State
- Fly, J. M., Ph.D. ................. Michigan
- Hay, R. L., Ph.D. ................. Duke
- Hodges, D. G., Ph.D. ............. Georgia

Assistant Professors:
- Bond, B. H., Ph.D. ............... Virginia Tech
- Buckley, D. S., Ph.D. .......... Michigan Tech
- Harper, C. A., Ph.D. ............. Clemson
- King, S. L., Ph.D. ............... Texas A&M
- Knowe, S. A., Ph.D. .......... Georgia
- Muller, L. I., Ph.D. ............. Georgia
- Van Manen, F. T., Ph.D. ....... Tennessee
- Wang, S. Ph.D. ......... Nanjing Forestry (China)
- Young, T. M., M.S. .......... Tennessee

Emeriti Faculty:
- Buckner, E. R., Ph.D. .......... NC State
- Dimmock, R. W., Ph.D. ....... Wyoming
- Rennie, J. C., Ph.D. ............ NC State
- Schneider, G., Ph.D. ........... Michigan State

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 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.
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. 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.
2. 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 20 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 resource 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 1650, 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.

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.
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.
423 Wildland Recreation Planning and Management (3) Planning process and site planing, site design projects; management strategies, methods of visitor and recreation site management; case studies. Weekend field trips. Prereq: 422 or consent of instructor.
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 adhesives; gluing of solid wood and composite wood manufacturing practices; laboratory manufacture and/or testing of adhesives, adhesive bond strength and glued-wood product performance; day field trip. Prereq: Wood Properties and Uses and Wood Identification, or consent of instructor. 1 hr and 2 labs.
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, veneer cutting, and laser machining: day field trip. Prereq: Wood Properties and Uses and Wood Identification, or consent of instructor. 1 hr and 2 labs.
500 Thesis (1-15) P/NP 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/N only.
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.
512 Seminar (1) Current developments in forestry. Required of all graduate students in residence in fall. May be repeated. Maximum 2 hrs. S/N only.
515 Forest Conservation Workshop (1-3) Relation of forest biology, ecology and management to conservation issues; integration of current conservation issues into classroom work and student projects; environmental education strategies. Not available to students in forestry or wildlife and fisheries science. May be repeated. Maximum 3 hrs.
520 Advanced Forest Ecology (3) Physiological ecology of natural communities of trees; relationships between overstory structure, microclimate, and understory responses: regeneration ecology; competition and effects of natural and human disturbance regimes at multiple scales; forest succession and stand dynamics. Prereq: Graduate standing in forestry or biological science, or consent of instructor.
Forestry, Wildlife and Fisheries

GRADUATE COURSES

410 Wildlife Habitat Evaluation and Management (3) Ecological relationships between wildlife and habitat. Evaluation, modeling, and management of wildlife habitat. Effects of land-use practices on wildlife habitat. Weekend field trips. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. Applicable to majors in Forestry and in Wildlife and Fisheries Science. 2 hrs and 1 lab.

416 Planning and Management of Forest, Wildlife and related land resource management through developing land management plans and analyzing case studies that demonstrate concept of sustainable development in Forestry and in Wildlife and Fisheries Science. Prerequisite: Senior standing 1 hr and 2 labs.

520 Natural Resource Issues at International Level (2) Identification and analyses of issues regarding forestry, wildlife, fisheries and wildland park resources beyond U.S. borders. Political, economic, social, and biophysical elements impacting natural resources in different parts of world. Northern Europe, Latin America, Asia, Africa, and South America. In-depth case study and class presentation required by student teams. Not available for students who have taken 420.

535 Environmental Impacts to Natural Ecosystems (3) Current environmental problems impacting natural ecosystems: climatic change, acid deposition, air pollution, species declines, and introductions of exotic species. Management methodologies to mitigate environmental problems. Overnight field trips. Prerequisite: 416 or equivalent or consent of instructor. Applicable to majors in Forestry and in Wildlife and Fisheries Science.

540 Seminar on Integrated Resources Management and in Biosphere Reserves (2) NAB program, UNESCO-sanctioned conservation initiative. Analysis of integrated resources management practices in integrated forest and wildlife management of freshwater fisheries: population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination and incremental growth assessment; stream assessment; equipment and instrumentation usage and maintenance; safety in sampling methods. Weekend field trip. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab.

442 Fisheries Techniques (3) Active and passive sampling techniques for fish and aquatic organisms; population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination and incremental growth assessment; stream assessment; equipment and instrumentation usage and maintenance; safety in sampling methods. Weekend field trip. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab.

530 Advanced Silviculture (3) Genetic improvement of forest trees, selection of superior phenotypes; field testing tools used, prescribed fire, pesticides, in regeneration and management activities; computer modeling of stand development and conducting forest genetics research. Prerequisite: Silvicultural methods and Biology 220 or consent of instructor.

540 Genetics in Forestry (3) Genetic improvement of forest trees, selection of superior phenotypes; field testing tools used, prescribed fire, pesticides, in regeneration and management activities; computer modeling of stand development and conducting forest genetics research. Prerequisite: Silvicultural methods and Biology 220 or consent of instructor.

550 Recreation Planning for Forests and Associated Lands (3) Planning process for recreation development and management; computer modeling of stand development and management operations. Prerequisite: Senior-level forest management or consent of instructor.

570 Management and Policy of Forest Resource Organization (3) Theory and application of management as applied to natural resource organizations: institutional direction and culture, 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. Prerequisite: Forest administration or consent of instructor.

580 Advanced Silviculture (3) Silvicultural characteristics, silvicultural practices and systems applied to commercially important hardwoods and softwoods. In-depth analyses of silvicultural principles involved and tools used, prescribed fire, pesticides, in regeneration and management; computer modeling of stand dynamics, structure, growth/yield. Prerequisite: Undergraduate silviculture course or consent of instructor. 2 hrs and 1 lab.

585 Advanced Forest Biometry (3) Application of sampling techniques to forest inventory; fixed and variable plot sampling; tis list sampling; Poison sampling; regression estimation; multiple and multistage phase sampling. Growth and yield predictors for even-aged and uneven-aged forests. Prerequisite: Land Measurement and Forest Resource Inventory or consent of instructor.

590 Advanced Topics in Forestry (1-3) Recent advances and concepts, research techniques and analysis of current problems. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.

593 Independent Study in Forestry (1-4) May be repeated. Maximum 6 hrs.

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


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.

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 wildlife habitat management, identification of wildlife field sign, wildlife capturing techniques and management plan preparation. Weekend field trips. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab.

442 Fisheries Techniques (3) Active and passive sampling techniques for fish and aquatic organisms; population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination and incremental growth assessment; stream assessment; equipment and instrumentation usage and maintenance; safety in sampling methods. Weekend field trip. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab.

443 Fisheries Science (3) Quantification and management of freshwater fisheries: population estimation, age and growth, biological assessment, and stocking. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab.

444 Ecology and Management of Wild Mammals (3) Biological and ecological characteristics of game mammals and endangered mammals. Current principles and practices of wildlife and fisheries management. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. One weekend field trip required.

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. Prerequisite: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. One weekend field trip required.

490 Ethics in Wildlife and Fisheries Management (1) Ethical bases for decision-making and application of methodologies in practice of wildlife and fisheries management. Seminars by ethicists, wildlife and fisheries scientists and managers, and foresters to acquaint students with diverse perspective of ethical behavior in practices of wildlife and fisheries management. Lectures, panel discussions, and case studies. Team taught. Prerequisite: Senior standing. S/NC only.

500 Thesis (1-15) P/NP 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 for a fee time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.


515 Seminar in Avian Ecology and Management (1-2) Readings and discussion based on current literature on contemporary topics in avian ecology and management. Additional awards for writing review paper on contemporary topic of interest to student. Prerequisite: Consent of instructor.

525 Endangered Species Management and Conservation of Biodiversity (2) Status, ecology and management of endangered wildlife and plant species. Historic aspects, policy implications and philosophical issues surrounding recovery efforts. Approaches to monitor and manage for biodiversity. Prerequisite: Graduate standing or consent of instructor.

530 Wildlife Diseases (2) Necropsy of birds and mammals. Recognition of various diseases and methods of preparing pathological materials in field and lab. Investigative procedures concerning wildlife diseases. Prerequisite: 1 yr biology, 444 or 445, or consent of instructor. (Same as Comparative and Experimental Medicine - Veterinary Medicine 530.)
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.

540 Predator Ecology (2) Dynamics of terrestrial vertebrate predator populations in human-altered and relatively unaltered environments. Use of computers. Prereq: Animal Science 571 or Statistics 538 or consent of instructor.

545 Advanced Population Analysis (2) Detail characteristics, assumptions, goals, methods, and current technologies for fish and wildlife population analysis. Use of computers. Prereq: Animal Science 571 or Statistics 538 or consent of instructor.

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: Forestry, Wildlife and Fisheries 410 or Geography 411 or consent of instructor.

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 physiology to aquaculture, pollution assessment, and fisheries management. Prereq: Senior or graduate standing in life sciences.

555 Fish Culture (3) Principles, concepts and techniques of culturing economically important fish and shellfish species. Prereq: 443 or consent of instructor. 2 hrs. and 1 lab.

556 Recirculating Aquaculture (3) Growing fish in intensive, indoor systems with reconditioned water. Techniques of solids removal, nitrification, and gas balance. Practical experience with operating system. Prereq: 443 or consent of instructor.

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.

French
See Modern Foreign Languages and Literatures

Geography
(College of Arts and Sciences)

MAJOR DEGREES

Geography ........................................ M.S., Ph.D.

Bruce Ralston, Head

Professors:
Aiken, Charles S., Ph.D. ................. Georgia Bell, Thomas L., Ph.D. .................... Iowa Foresta, Ronald, Ph.D. ................. Rutgers Harden, Carol P., Ph.D. ................... Colorado Horn, Sally P., Ph.D. ............... California Jumper, Sidney R. (Liaison), Ph.D. Lowry, Charles, Ph.D. ................. Tennessee Minkel, C. W., Ph.D. ................. Syracus Pulsefursion, Lydia, Ph.D. ................ Southern Illinois Ralston, Bruce, Ph.D. ............. Northwestern Rehder, John B., Ph.D. ............... Louisiana State

Associate Professors:
Orvis, Kenneth H., Ph.D. .............. California Shaw, Shih-Lung, Ph.D. .............. Ohio State

Assistant Professor:
Grissino-Mayer, Henri, Ph.D. ........... Arizona

The department offers the Master of Science and Doctor of Philosophy degrees.

The department emphasizes the development of professional competence as a geographer and offers opportunities to gain substantial depth in a concentration or 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 geography, 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 equivalent 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 achieved in a comprehensive master's program. Course requirements for the degree shall be determined by the student's faculty committee in accordance with specific interests and needs. The program must include 504, 515, 599, 9 hours of 600-level seminars, and (at least one offering during residency) 501. A minimum of 9 semester hours must be earned in collateral 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. specialization must 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, comprised of 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.

GRADUATE COURSES

410 Global Positioning Systems and Geographic Data Management: 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) Concepts, 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 data 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 application of statistical techniques: point pattern analysis, and analysis of areal units. Prereq: Mathematics 115 Statistical Reasoning or Statistics 201 Introduction to Statistics 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.)

432 Dendrochronology (4) Principles, techniques, and interpretation in tree-ring science. Applications in geography, climate, ecology, forestry, archaeology, and regional studies. 3 hours lecture and 2 hours lab per week. Prereq: 131-132 Geography of the Natural Environment or consent of instructor.

433 The Land-Surface System (3) Characteristics of surface forms, water, vegetation, and surface materials, and their regional interrelationships. People as evaluators and agents of change. Prereq: Geography of the Natural Environment or consent of instructor.

434 Climatology (3) General circulation system leading to world pattern of climates. Climatic change and modification, and interrelationships of climate and human activity. Prereq: Geography of the Natural Environment or Meteorology or consent of instructor.

435 Biogeography (3) Changing distribution patterns of plants and animals on world map and in temporal scales, Effects of continental drift, Pleistocene climatic change, and human activity on world biota. Prereq: Geography of the Natural Environment or consent of instructor.
436 Water Resources (3) Global water resources and hydrologic processes: water availability, flooding, and water quality issues from physical and economic 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 of Canada, the U.S., Mexico, and Central America. Relationships of fire, and human disturbance. Long-term history and future prospects. Prereq: Coursework in geography or botany or consent of instructor.

441 Urban Geography of the United States (3) Concepts and theories concerning development and significance of systems of cities and internal morphology 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. Problems and potentials of rural America. Writing emphasis course.

449 Geography of Transportation (3) Examination of transportation systems and their effects on economic, social, and environmental 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 in content, skills, 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.

495 Special Topics in Geography (1-4) Topics vary. Prereq: consent of instructor. May be repeated with consent of instructor. Satisfactory/No Credit or letter grade. Maximum 8 hrs.

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

501 Colloquium in Geography (1) Discussion of departmental research, current research literature, and general topics. Registration required of resident graduate students within department. 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 he or she is using University facilities and/or 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 environment of real-world GIS sites. Prereq: 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 geography. 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: 449 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. S/NC or letter grade.

592 Off-Campus Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

599 Geographic Concept and Method (3) Traditional and modern geographic thought; readings on nature, scope, problems, and methods of geography. Prereq: Consent of instructor.

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

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.

632 Seminar in Dendrochronology (3) Prereq: 432 or 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.

German
See Modern Foreign Languages and Literatures

Health and Exercise Science

(Choolge of Education, Health, and Human Sciences)

MAJORS

DEGREES

Exercise Education ..................................................Ph.D.
Exercise Science .....................................................M.S.
Health Promotion and Health Education ..................M.S.
Human Ecology .....................................................Ph.D.
Public Health .........................................................M.P.H., M.S.-M.P.H.
Safety .................................................................M.S.

Edward T. Howley, Interim Head

Professors:


Associate Professors:

Carney, Paula (Liaison), Ph.D. .... Wayne State Keel, Martha, M.S. ................. Tennessee Pursley, R. Jack, Ph.D. ............... Iowa Smith, Susan M. (Liaison), Ed.D. ........ Tennessee Thompson, Dixie L., Ph.D. ............... Virginia Zhang, Songning, Ph.D. ............... Oregon
Assistant Professor:  
Klein, Diane S., Ph.D.  ............... Arizona State

The Health and Exercise Science Department fosters development of those with career interests in health education/promotion, exercise science, public health, and safety. The Department of Health and Exercise Science offers graduate programs leading to degrees, majors, and concentrations in:

**Master of Science**  
**Health**  
Health Promotion and Health Education  
Safety  
**Exercise Science**  
Exercise Physiology  
Biomechanics/Sports Medicine  
**Master of Public Health**  
**Master of Science - Master of Public Health (Dual Degree)**  
**Doctor of Philosophy**  
**Education**  
Exercise Science (Exercise Physiology or Biomechanics/ Sports Medicine)  
Human Ecology  
Community Health  

**MINOR IN GERONTOLOGY**  
An intercollegiate/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 Education, Health, and Human Sciences 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 Education, Health, and Human Sciences” form. Copies of this form are available in the Department of Health and Exercise Science.

**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, Educational Psychology 504, 522, 525, 528.
2. Applied practicum. 2 hours required. Students should register under practicum experiences in the “home” department of the supervising faculty.

3. Health 585. 1 hour required. Cross-listed with participating departments.
4. Successful completion of a written comprehensive examination covering subject matter of the minor.

**Graduate Committee**  
At least one faculty member from the Gerontology Policy Committee who is qualified to work with graduate students, must serve on the graduate committee of each student who declares a gerontology minor.

**Admission to Candidacy**  
When application is made for admission to candidacy, indication of the minor must be noted on the Admission to Candidacy form.

**Exercise Science**  
The Exercise Science concentration is dedicated to promoting and integrating scientific research and education on the health benefits of exercise. Through a program of interdisciplinary graduate study, using both experimental and epidemiological methods, students gain a greater understanding of the role of exercise in the prevention of various cardiovascular, metabolic, and musculoskeletal disorders. The Exercise Science faculty offers graduate degrees (M.S. and Ph.D.) in two specialties: Exercise Physiology and Biomechanics/Sports Medicine.

The Exercise Physiology specialty involves the study of the acute and chronic effects of exercise on the human body. At the Master’s level, students may choose from two tracks: (1) adult fitness/cardiac rehabilitation, or (2) applied physiology research. Students may elect to do internships in cardiac rehabilitation at several area hospitals, and are encouraged to take the ACSM Exercise Specialist® exam upon graduation. The Ph.D. Program requires course work in the life sciences, physiological chemistry, statistics and advanced topics in exercise physiology. Graduate students collaborate with an exercise physiology faculty member to perform research in the areas of physical activity assessment, metabolism, the health benefits of exercise, and body composition.

The Biomechanics/Sports Medicine specialty involves the study of biomechanical implications to exercise and rehabilitation. This program area focuses on the mechanisms, prevention, and rehabilitation of musculoskeletal injuries. The emphases in courses taught in this area include biomechanical as well as medical considerations related to exercise and/or rehabilitation. The Ph.D. Program requires course work in engineering mechanics, numerical analysis, statistics, and advanced topics in biomechanics. Graduate students work with biomechanics/sports medicine faculty to pursue research in the areas of biomechanics of lower extremity function, footwear biomechanics, core stability, flexibility, and the biomechanics of injury mechanism and prevention.

**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, in general, 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 students 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, Health and Exercise Science Department, The University of Tennessee, Knoxville, TN 37996-2700.

**MASTER’S PROGRAMS**  
- **Exercise Physiology Concentration**  
  Exercise Science 508 (or Health 590), 533, 565, 567, 635, 601 (1 hr seminar, 2 enrollments). Either ES 501 (project) or ES 500 (thesis—must also take a statistics course approved by advisor). Electives approved by advisor from Exercise Science, Nursing, or Nutrition  
- **Biomechanics/Sports Medicine Concentration**  
  Exercise Science 508 (or Health 590), 513, 516, 531, 581 (1-3 cr), 601 (1 hr seminar, 2 enrollments). Either ES 501 (project) or ES 500 (thesis—must also take a statistics course approved by advisor). Electives approved by advisor from Exercise Science, Sports Studies, or Biomedical Engineering.
- **Ph. D.—EDUCATION**  
  - **Exercise Science Concentration**  
    15 hours in Exercise Science.  
    9 hours in an Exercise Science specialization.  
    Biomechanics/Sports Medicine, Exercise Physiology, Physical Activity and Population Health, or other area approved by committee.
    3 registrations in ES 601 Seminar.  
    6 hours in a cognate selected from outside the student’s major field. The cognate must be related to and supportive of the Concentration and Specialization.
    15 hours in research methodologies or research experience.  
    24 dissertation hours.  

*The above are viewed as minimum requirements and are subject to modification by the student’s committee.*
Health

The Health and Exercise Science Department offers graduate programs leading to the Master of Science with majors in Health Promotion and Health Education and in 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 the department.

The department fosters development of pre-professional and professional competencies by those with career interests in the disciplines of health education/promotion, public health, and safety. The Health, Safety, and Exercise Science academic programs emphasize strategies of health promotion (education and lifestyle behaviors) and health protection (regulatory, environmental, and safety) for improving individual and community health and well-being. The faculty are committed to the educational value of community-based service learning, applied research, and community outreach. For more information, http://hss.he.uitk.edu.

Ph. D.—HUMAN ECOLOGY

Community Health 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 the doctoral committee.
4. Minimum 6 hours in a cognate area.

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 chair. Preference 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, recommendation of department and approval of 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:
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 web site: http://hss.he.uitk.edu/pubhealth.

DUAL M.S.-M.P.H. PROGRAM

Also offered is 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, the program meets 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 Exercise 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 at any time prior to, or after, matriculation in either or both departments. Such approval will be granted, provided that dual program studies be started prior to entry into the fourth semester of the M.S. and M.P.H. programs.

Curriculum

A dual degree candidate must satisfy the requirements for both the M.S. (public health nutrition concentration) and the M.P.H. degrees, as well as the requirements for the dual program. All candidates for the dual degree must successfully complete Health and Society (PH 555), two credits of Seminar in Public Health (PH 509), and a minimum of 60 credits. The Department of Nutrition will award a maximum of 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 Exercise Science. The department 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.
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.

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 27 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 Exercise Science. A list of courses is available for each concentration. Students may elect an internship experience with private industry or non-profit organizations to fulfill part of their course requirements. Course experience in research, software 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.

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.

501 Special Project (3) Culminating 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 when the student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.

508 Research in Exercise Science (3) Research for writing of thesis and institutional review board proposals; presentation of research through free communications and poster presentations; calculation and interpretation of statistics related to common research designs used in research; and use of computer software.

509 Graduate Seminar in Public Health (1) (Same as Public Health 509, 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 mortality. Use of large and small data sets. Prereq: Course in statistics or consent of instructor.

525 Epidemiology of Injury and Violence (3) Epidemiologic methods to describe magnitude and examine etiology of injury and violence. Alternative to Preventing or controlling occurrence of injury and violence in both general population and high risk sub-populations.

531 Biomechanics (3) Biomechanical principles and applications to analyses of human movements. Prereq: General physics.

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 Practicum (1-3) Supervised 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, kinetic and muscle activity measurement of human movements using computerized videography, force platform, electromyography and other relevant instruments. May be repeated. Maximum 3 hrs. S/NC only.

585 Seminar in Gerontology (1) (Same as Counseling Education 585; Nursing 585; Educational Psychology 585; Health 585; Nursing 585; Public Health 585; Social Work 585; Sociology 585.)

593 Independent Study (1-3) May be repeated. S/NC or letter grade.

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

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 disability. Prereq: 2 graduate statistics courses or consent of instructor.

635 Physical Activity and Positive Health (3) Review of clinical, epidemiological, and experimental evidence concerning relationship and effects of exercise on health-related 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) Intern experience in areas of major interest. May be repeated.

693 Independent Study (1-3) May be repeated. S/NC or letter grade.

Health

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.)

405 Alcoholism and Alcohol Education (3) Problems of alcoholism. Factors which make alcoholism serious 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, physical, legal and social implications of death.

420 Sex Education As It Relates to Human Sexuality (3) Exploration of science of human sexuality. Trends, issues, and content of sex education.

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.)

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.

465 Aging and Health (3) Aging process in health perspective as related to health promotion and wellness of aged.

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

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 not be used toward degree requirements. May be repeated. S/NC only.
Public Health

GRADUATE COURSES

400 Consumer Health (3) (Same as Health 400.)

410 Worksite Health Promotion (3) Foundations of health promotion programs delivered in worksite that revolve around issues relative to employees and management: theory, program design, implementation and evaluation from perspective of health promotion specialist. Prereq: Health Education, Promotion, and Behavior.

493 Directed Independent Study (1-3) Individual in-depth study of selected issues. Prereq: Consent of instructor. 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 only.

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. Speakers both internal and external. May be repeated. Maximum 4 hrs. (Same as Nutrition 509, Nursing 509, Exercise Science 509 and Social Work 509.) S/NC only.

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 healthful living today and in the future.

520 Public Health Policy and Administration (3) Administrative considerations of community-based health services programs and public health infrastructure. Health policy formulation, public environmental and governmental involvement in health, legal responsibilities, and managerial concepts/techniques/process.

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; development of program plans.

590 Research Methods in Health (3) Basic research techniques in variety of health settings. Development of research skills and problem identification for research topic. (Same as Public Health 590.)

593 Directed Independent Studies (1-3) Individual identification and study of health/wellness or health promotion problem/issue. Specific proposal to instructor before registration. May be repeated. Maximum 12 hrs.

600 Doctoral Research and Dissertation (3-15) Prerequisite: Consent of instructor. May be repeated. Maximum 60 hrs. (Same as Counseling Education 585, Educational Psychology 585, Exercise Science 585; Nursing 585; Public Health 585, Social Work 585, and Sociology 585.)

580 Special Topics (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

585 Seminar in Gerontology (1) (Same as Counseling Education 585, Educational Psychology 585, Exercise Science 585; Nursing 585; Social Work 585. Sociology 585.)

587-88-89 Internship (3,3,3) Internship (community health education, gerontology, or health planning/administration) in either approved organization or research setting under supervision of designated preceptor. Prereq: M.P.H. major, one semester advance notice and consent of major advisor. 859: available for approved extended placements. S/NC only.

590 Research Methods in Health (3) (Same as Health 590.)

593 Directed Independent Study (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

635 Physical Activity and Positive Health (3) (Same as Exercise Science 635.)

650 Health Aspects of Gerontology (3) (Same as Health 650.)

655 Seminar in Nation's Health (3) (Same as Health 655.)

660 International Health (3) (Same as Health 660.)

Safety

GRADUATE COURSES

443 Sports and Recreational Safety (3) Accident prevention and injury control in sports activities; philosophy of sports safety; human environmental factors and interrelationship in sports injuries and control; risk-taking and decision-making; and safety principles and techniques of sports medicine to safety. 3 hrs and 2 labs.

452 Safety Principles and Practices (3) General safety principles and practices in the fields of occupational and community safety. Historical and present safety issues, problems and practices addressing safety of individuals and groups in work-site, school, community, transportation, and industrial settings. Prereq: Junior or Senior standing or consent of instructor.

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.

500 Thesis (1-15) P/NP 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.

532 Behavioral Problems in Safety Education and 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.

533 Problems and Research in Accident Prevention (3) Safety problems found in wide variety of accidents that occur in community; findings of current research in behavioral sciences as related to variation incidence of accidents.

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/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.
History

(College of Arts and Sciences)

MAJOR DEGREES

History ........................................... M.A., Ph.D.

Todd A. Diacon, Head

Professors:

Brummell, Palmira R., Ph.D. .................... Chicago
Cutler, E. Wayne, Ph.D. ........................ Texas
Farris, W. Wayne, Ph.D. ....................... Harvard
Feller, Daniel, Ph.D. ............................. Wisconsin
Moser, Harold, Ph.D. ............................ Wisconsin
Norrell, R. Jeff (Bernadotte Schmitt Professor), Ph.D. ............................ Virginia
Wheeler, W. Bruce, Ph.D. ........................ Virginia

DeWeerdt, Hilde, Ph.D. ......................... Harvard
Kulikowski, Michael, Ph.D. .......................... Toronto
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 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 elsewhere may be applied toward the M.A. degree. Except by prior approval of the Director of Graduate Studies, a student’s coursework must be at the 500 level or above.

Thesis Option

Twenty-four hours of coursework and 6 hours of Thesis 500 for a total of 30 hours 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

Retention and Termination

A 3.0 overall grade-point average is required to remain in good standing. M.A. students must take the M.A. examination no later than the semester following the completion of 30 hours. A student who fails the M.A. examination must repeat the examination no later than the following semester. A student who fails the examination a second time or does not take the examination when required will be dropped from the graduate program.

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) before that required for the M.A. Up to 6 hours may be taken outside of the department.
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 statistical expertise, 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 consists of a written exam (Group I) and an oral exam (Group II) and must be taken no later than the semester following the semester in which the student completes the residence, coursework, and language requirements (summer excluded). Failure to take the comprehensive examination within the required time will be counted as a failure on the examination. No student will be permitted to take the comprehensive examination unless he or she has passed the Group III examination (see above) and has an overall grade-point average of at least 3.0. Qualified students will be examined in one field selected from the Group I list.
below and one field selected from the Group II list below. The two exams are taken in the same semester. The Group I is an 8-hour written exam. It must be passed before the Group II can be taken. The Group II is a 2-hour oral exam. A student who fails either exam must repeat it the following semester (summer excluded). A second failure on either exam will cause the student to be dropped from the History graduate program. A student who does not repeat a failed exam within the required time will likewise 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 Republican
  - 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.
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 Foundations of Graduate Study in History (3) Assumptions and methods of historians. Required of all candidates for advanced degrees.
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.
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 Education, Health, and Human Sciences)

MAJOR DEGREE
Human Ecology .................................................. Ph.D.

The College of Education, Health, and Human Sciences offers the Doctor of Philosophy in Human Ecology with concentrations in the following:

- Child and Family Studies
- Community Health
- Hospitality and Tourism Management
- Nutrition Science
- Retail and Consumer Sciences

Further information on the on the above concentrations is available in the Fields of Instruction (i.e., academic departments) section of this catalog.

Application Process
Individuals seeking admission to the Ph.D. in Human Ecology must be first admissible to The University of Tennessee (see Graduate Studies: Admission Requirements section of this catalog) and then admitted to a concentration within the Ph.D. in Human Ecology. Prospective students are encouraged to make application at least 6-months before anticipated matriculation. Applications are reviewed February 1, June 1, and November 1.

Overview of Program
A major challenge of the doctoral program is to draw upon basic research generated by the natural sciences, humanities, and social sciences so as to provide a holistic perspective that contributes to the improvement of
both individuals and families. The Ph.D. is a research degree granted only to individuals who demonstrate proficiency in conducting original research. Course requirements are determined by each student's faculty committee and are based on the needs and interests of that particular student, as well as department and College requirements. Further information is available in the Fields of Instruction (i.e., academic departments) section of this catalog and online at http://cehs.utk.edu/main.html.

GRADUATE COURSES

450 Special Topics: Human Ecology (1-3) Study in selected professional area within the college. Topics vary. May be repeated. Maximum 6 hrs.

500 Thesis (1-15) P/NP 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.

520 Directed Study in Human Ecology (1-3) Integrative topics. Prereq: At least 9 hrs of graduate study in college including courses from at least two departments or consent of instructor. May be repeated. Maximum 6 hrs.

Human Resource Development (College of Business Administration)

MAJORS DEGREES

Business Administration ................. Ph.D. Human Resource Development .......... M.S.

Michael Lane Morris (Liaison), Director

Associate Professors:

Kupritz, Virginia, Ph.D. ............... Virginia Tech
Morris, Michael Lane,
Ph.D., CFLE ...................... Tennessee
Stout, Vickie J., Ed.D. ............... Tennessee

Assistant Professors:

Bartley, Sharon, Ph.D. .................. Tennessee
Lim, Doo, Ph.D. ...................... Illinois
Pierce, Randal, Ph.D. ................. Ohio State

Lecturer:

Mackey, Debbie L., Ph.D. .............. Tennessee

The Human Resource Development Program integrates occupational education, training, career development, and organizational development. The curriculum goal of the program centers around producing organizational effectiveness through a guiding framework that focuses on developing human resource skills and understanding of organizational culture, systems and structures, and decision-making; individual, group, organizational learning; high performance teaming; organizational change, communication processes; and analysis, action, measurement of economic outcomes. Human Resource Development required (core) courses and Human Resource Development electives are offered in diverse 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.

Admission Requirements

Applicants for admission should request information and application forms from both the Office of Graduate and International Admissions (218 Student Services Building) and the Human Resource Development Program (408 Stokely Management Center, The University of Tennessee, Knoxville, Tennessee, 37996).

Applicants are to submit an application for admission to Graduate Admissions. Additionally, students are to submit an application, 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 Human Resource Development Program. Applicants must hold a bachelor's degree from an accredited institution and present evidence of ability to do graduate work, including a GPA of 3.0 on a 4.0 scale for the last two years of undergraduate work. Any student below this level of academic quality must justify admission via other exceptional credentials. If the applicant has prior work experience in human resource development, a reference letter should also be provided by the work supervisor. Applicants without an undergraduate degree in an area related to human resource development, previous HR employment experience, or a statistical background may be required to complete additional course work as part of their program. Recent Graduate Record Examination scores are required of all applicants. Minimum GRE composite scores (quantitative and verbal) of 1000 are required. Deadline: New students are admitted in fall semester only. Applications must be received by March 1.

Degree Requirements

The HRD Master's degree program is a 39 hour non-thesis program. All students must take the program core of 18 hours consisting of HRD 510 (Foundations of Human Resources), HRD 556 (Organizational Development Strategies), HRD 557 (Design Strategies), HRD 559 (Evaluation Strategies), HRD 561 (Strategic Human Resource Development), and HRD 563 (Organizational Communication Strategies). In addition to the program core, all students must complete Management 521 (Human Resource Management) and 6 hours of 400 and/or 500 level courses in human resource management. For the remaining 12 hours, students will select 4 out of the 5 following courses: HRD 511 (Issues and Trends in Human Resource Development), HRD 517 (Career Development), HRD 518 (Human Performance Improvement Systems and Technologies), HRD 519 (Human Resource Problems), or HRD 520 (Collaborative Strategies in Human Resource Development).

Course Requirements:

<table>
<thead>
<tr>
<th>Course Requirements:</th>
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<tbody>
<tr>
<td>Hours</td>
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<tr>
<td>HRD Core</td>
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<tr>
<td>HRD 510 (Foundations of Human Resources)</td>
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<tr>
<td>HRD 556 (Organizational Development Strategies)</td>
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<tr>
<td>HRD 557 (Design Strategies)</td>
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<tr>
<td>HRD 559 (Evaluation Strategies)</td>
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<tr>
<td>HRD 561 (Strategic Human Resource Development)</td>
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<tr>
<td>HRD 563 (Organizational Communication Strategies)</td>
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<td>Total 39</td>
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</table>

THE PH.D. PROGRAM

Admission Requirements

Applicants for admission should request information and application forms from both the Office of Graduate Admissions, 218 Student Services Building, and the Human Resource Development Program, 408 Stokely Management Center, The University of Tennessee, Knoxville, Tennessee, 37996.

Applicants are to submit an application for admission to Graduate Admissions. Additionally, applicants are to submit an application, 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 Human Resource Development Program. Deadline: New students are admitted in fall semester only. Applications must be received by the Graduate Admissions Office and Human Resource Development Program by March 1.

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. Applicants without a graduate degree in an area related to human resource development may be required to complete additional course work as part of their program. If the applicant has prior work experience in human resource development, human resource management, or a related occupational area, a reference letter should be provided by the work supervisor. Graduate Record Examination scores are required of all applicants. Minimum GRE composite scores (quantitative and verbal) of 1100 are required.

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 is 60 hours with a major in Business Administration and a concentration in Human Resource Development 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 not possessing a master’s degree before acceptance to the program may be required to complete additional coursework before enrolling into any courses associated with the doctoral program. 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 HRD Courses Research Core, and Business Core; students who did not complete a thesis in their Master’s program must complete a pre-doctoral research project prior to beginning dissertation work, and must pass a comprehensive final oral examination on their dissertation research. Detailed information regarding the Ph.D. concentration program of study may be obtained from the Program Liaison.

Course Requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester</th>
<th>Credits</th>
<th>Notes</th>
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<tbody>
<tr>
<td>HRD Core</td>
<td></td>
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<tr>
<td>HRD 602</td>
<td>(Proseminar I in Human Resource Development-Fall 1st Year)</td>
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<tr>
<td>HRD 603</td>
<td>(Proseminar II in Human Resource Development-Spring 1st Year)</td>
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<tr>
<td>HRD Seminars</td>
<td>Students consult with doctoral advisor and committee to select 3 courses</td>
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<tr>
<td>HRD 605</td>
<td>(Seminar in Organization Theory and Environmental Context)</td>
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<tr>
<td>HRD 606</td>
<td>(Research in Human Resource Development)</td>
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<td></td>
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<tr>
<td>HRD 607</td>
<td>(Seminar in Communication Processes)</td>
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<td>12</td>
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<tr>
<td>HRD 608</td>
<td>(Seminar in Work/Life Interface Issues)</td>
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<td>12</td>
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<tr>
<td>HRD 609</td>
<td>(Seminar in Technological Frameworks for Human Resource Development)</td>
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<td></td>
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<tr>
<td>HRD 613</td>
<td>(Seminar in Selected Topics)</td>
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<tr>
<td>Research Core</td>
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<tr>
<td>Statistics Principles (Statistics 531-532 or Statistics 537-538 or equivalent)</td>
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<tr>
<td>Advanced Statistics (Statistics 579) or (I/O Psychology 627)</td>
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<tr>
<td>Seminar in Research Methods (Marketing 612)</td>
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<td>Business Core</td>
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<tr>
<td>Seminar in Theoretical Foundations (Marketing 611)</td>
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<td>International Management (Management 571)</td>
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<td>Proseminar in I/O Psychology (Industrial/Organizational Psychology 568)</td>
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<tr>
<td>Dissertation</td>
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<td>24</td>
<td>Total 60</td>
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</table>

Graduate Courses

500 Thesis (1-15) P/NP only.
502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when the University is open.
509 Implementation of HRD Systems (3) The internship provides experiential learning for students who come to HRD without practical real world experience. The internship is an opportunity to apply classroom knowledge, obtain additional human resource experience, and reflect on the knowledge and experience. The corporate experience provides additional human resource knowledge that assists the student in research and career advancement. Prerequisite: HRD 510 (Foundations of Human Resources).
510 Foundations of Human Resources (3) Students develop a working definition and understanding of the foundations that grid the academic discipline and profession of Human Resources. Students develop knowledge of the historical, theoretical, and philosophical foundations as well as the core models of learning, performance, change and management that promote best practices in the field. Students are introduced to the principles of training and development, human resource development, organizational development, and management including HRM goals and activities.
511 Issues and Trends in Human Resource Development (3) Study of current, emerging, and future issues and trends in Human Resource Development (HRD) research and practice. Linking research and practice, importance of theory to inform practice, research needs reflected in practice, cycle of how researchers and practitioners learn, how they design practice, and how they evaluate to inform policy. Prerequisite: HRD 510 (Foundations of Human Resources).
513 Special Topics in Human Resource Development (1-3) Topics vary in research, theory and current issues in Human Resources. Prerequisite: Consent of instructor. May be repeated. Maximum 9 hrs.
514 Individual Study in Human Resource Development (3) Prerequisite: Consent of supervising instructor. Approval form must be filed in office of the Program Liaison. May be repeated. Maximum 6 hrs.
517 Career Development (3) Examination of processes and practices that facilitate the individual's leadership development, performance improvement and career goals in relation to the organization's present and future human resource needs, including identification of personal responsibilities and organizational opportunities through successful career development systems.
518 Performance Improvement Systems and Technologies (3) Provides studies of concepts, strategies, tools, and trends of performance improvement technologies. Major emphasis will be on the planning, facilitating, and implementation of performance technologies that support HR functions and facilitate their value to organizational success. Prerequisite: HRD 510 (Foundations of Human Resources).
519 Human Resource Problems (3) Accommodates experiential learning for students who have a background in human resource development (HRD). In an employment context, students identify, analyze, design, develop, implement, and evaluate a practical HRD intervention. Prerequisites: HRD 510 (Foundations of Human Resources) and HRD 511 (Issues and Trends in HRD).
520 Collaborative Strategies in HRD (3) Examines the strategies for collaboration and teambuilding within organizational systems. The course assists HR professionals understand processes associated with teambuilding including defining types of teams, re-examining and evaluating team performance, operating principles and communication within teams. The primary focus of this course is the development of interpersonal and performance team. Prerequisite: HRD 563 (Organizational Communication Strategies).
555 Organizational Development Strategies (3) Overview of the roles, strategies, and challenges of organizational development with a focus on the dynamics of organizational development and the internal integration of organizational culture in a global context. Co-requisite: HRD 510 (Foundations of Human Resources).
559 Evaluation Strategies (3) Evaluation strategies for professional settings. This course examines the importance of evaluation, how to conduct appropriate evaluations, instrumentation and analysis strategies, how to assess the return-on-investment, and guidelines for creating an evaluation report. Prerequisite: HRD 557 (Design Strategies).
561 Strategic Human Resource Development (3) Overviews how human resource development (HRD) increases organizational competitive advantage. Human capital theory, systems theory and systems integration emerge as theoretical frameworks for linking HRD with business strategy in design of strategies and initiatives. Value creation for HRD stakeholders, management of HRD resources, and continuous improvement and innovation in HRD are emphasized. Students explore the role of HRD in organizational visioning, planning, leadership development, innovating, and change management. Co-requisite: HRD 510 (Foundations of Human Resources).
563 Organizational Communication Strategies (3) Students investigate organizational communication theory, purposes, channels, practices, styles, approaches, skills, and tools. Process improvement strategies span internal and external communication and target oral, written, and nonverbal communications that occur in face-to-face, technology-mediated, and blended organizational communication contexts.
560 Doctoral Research and Dissertation (3-15) P/NP only.
602 Proseminar I in Human Resource Development (3) Basic thought, concepts, and issues required for advanced graduate study in human resource development. Consent of instructor in first year of study in program. Consent of instructor for non-HRD students.
603 Proseminar II in Human Resource Development (3) Basic thought, concepts, and issues required for advanced graduate study in human resource development. Must be taken during first year of study in program. Consent of instructor for non-HRD students.
605 Seminar in Organizational Theory and Environmental Context (3) Explores the fundamental structure and basic systems influencing individual, group, and organizational behavior with an emphasis on environmental context impacting worker performance and opportunities for learning transfer. Ecological approach to organizational effectiveness is addressed. Prerequisites: HRD 602 and 603 (Proseminars I and II in Human Resource Development).
606 Research in Human Resource Development (3) Theory and application of qualitative approaches to social science and human resource development research. Emphasis is on ethnographic methods to obtain in-depth information about behaviors and beliefs of people in natural settings. Use of methods: structured interviews using heuristic elicitation methodology, unstructured interviews, and case studies. Prerequisites: HRD 602 and 603 (Proseminars I and II in Human Resource Development).
607 Seminar in Organizational Communication Processes (3) Students study how the elements and complexities of organizational communication (OC) lead to potential miscommunications. This course involves analysis of contemporary and leading-edge OC systems and processes. Students address prevention and minimization of destructive system and process complexities, and maximization of constructive elements and explore organizational and individual accountability for creating, sustaining, and improving OC systems, processes, and environments. Prerequisites: HRD 602 and 603 (Proseminars I and II in Human Resource Development).
ADMISSION REQUIREMENTS

Applicants for admission should request information and application forms from both the Office of Graduate Admissions (218 Student Services Building) and the Director, Industrial and Organizational Psychology Program, (408 Stokely Management Center, The University of Tennessee, Knoxville, Tennessee 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 Graduate Admissions 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: Hours

Coursework:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>I/O Psychology Core</td>
<td>587, 568, and 569</td>
</tr>
<tr>
<td>Research Core</td>
<td>537 and 538 or equivalents</td>
</tr>
<tr>
<td>Statistical Principles (Statistics 537 and 538 or equivalents)</td>
<td>12</td>
</tr>
<tr>
<td>Multivariate Statistics (Statistics 579, 679 or equivalent)</td>
<td>12</td>
</tr>
<tr>
<td>Advanced Research Methods (605 or equivalent)</td>
<td>12</td>
</tr>
<tr>
<td>General Psychology Core</td>
<td>500</td>
</tr>
<tr>
<td>I/O Psychology Seminars</td>
<td>600</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>300</td>
</tr>
</tbody>
</table>

Approved Electives: Courses supporting the student's course of study.
Industrial Engineering

(College of Engineering)

MAJOR DEGREES
Industrial Engineering .......... M.S., M.S.-MBA

Badiru, A.B. (Head), Ph.D. .... Central Florida, P.E.

Professors
Badiru, A.B. (Head), Ph.D. .... Central Florida, P.E.
Ding, F., Ph.D. ............... North Carolina State
Garrison, G.W. (UTSI), Ph.D. .... North Carolina State

Associate Professors
Aikens III, C.H., Ph.D. ......... Tennessee, CPEng.
Hailey, M.L. (UTSI), Ph.D. .... Texas Tech., P.E.
Jackson, D.F., Ph.D. ............ Tennessee, P.E.
Liggett, H.R., Ph.D. .......... North Carolina State
Sawhney, R.S., Ph.D. .......... Tennessee

Assistant Professors
Coleman, G.D. (UTSI), Ph.D. .... Virginia Tech, P.E.
Ford, R.E., Ph.D. ............ Tennessee
Kim, D., Ph.D. .............. Florida
Kong, D., Ph.D. ............... Penn State

Research Faculty and Staff
Halstead, P.D., B.S. .......... State University of New York
Cook, E.M. ..................................

The Department of Industrial Engineering offers a graduate program leading to the Master of Science degree with a major in Industrial Engineering, concentrations in traditional industrial engineering, engineering management, human factors engineering, 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 of 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 relevant experience as a practicing engineer or scientist. This concentration is fully supported off-campus utilizing electronic media for videotaping and interactive distance teaching methods.

Human Factors Engineering

Human factors engineering is concerned with ways of designing jobs, machines, operations, and work environments so they are compatible with human capacities and limitations. The human factors practitioner, operating within an industrial or service environment, is called upon both to apply existing human performance knowledge to the design or modification of work and workplaces and also to generate new experimental data required for system design and evaluation.

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

August—First Year
BA 511 MBA Core I 3

Fall—First Year
BA 512 MBA Core II 15
supervising doctoral research and dissertation work. The IE graduate committee administers the program within the department.

Admission to the Ph.D. program with a concentration in industrial engineering requires an undergraduate degree and academic background that meets the admission criteria for the master's program in industrial engineering or a master's degree in industrial engineering (or a closely related field), and previous academic performance that clearly demonstrates the capacity to do original research and technical investigative work and the potential for a successful scholarly career. If admitted, prerequisites (if required) will be established by the graduate committee based on the student's academic background. All students are required to take the Graduate Record Examinations (GRE), and submit three letters of reference and a personal statement about their professional goals. International students are also required to take the Test of English as a Foreign Language (TOEFL).

Graduate Council.

The dual degree candidate must satisfy the minimum criteria established by the College of Engineering, plus two elective concentrations in industrial engineering and work experience. Applicants must meet advising conference with each individual providing by the participating departments.

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 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.

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, banking, industry. Prereq: 306.


421 Information Systems Analysis and Design (3) Systems engineering approach to analysis, design, development, and implementation of systems of information. Informational requirements of industrial engineering systems. Utilization of relevant software packages. Prereq: Senior standing or consent of instructor.

422 Senior Industrial Engineering Problems Analysis (3) Application of industrial engineering to field assignments in local organizations, problem definitions, analysis and presentation. Prereq: Expected term of graduation or consent of instructor.


440 Process Improvement Through Planned Experimentation (3) Fundamentals of continuous improvement: advanced statistical process control techniques, and strategies for short production runs. Use of experimental design techniques to improve processes: single and multiple-factor designs, blocking and confounding, and fractional designs. Full factorial designs compared to fractional designs to balance experimental efficiency with loss of information. Lab component utilizes statistical and simulation software to provide hands-on experience. Prereq: 300 Engineering Data Analysis and Process Improvement.

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.)

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

501 Design Project (1-3) Enrollment limited to industrial engineering students in non-thesis program. May be repeated. Maximum 6 hrs. SNC 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/N/C only.

503 Industrial Engineering Methods Review (3) Survey of industrial engineering tools and techniques applied to analysis, design, and improvement of manage
509 Multidisciplinary Project (1) ... of manufacturing systems: line balancing, set-up time reduction, cost
management, maintenance support and other selected topics. Application at enterprise level to achieve strategic competitive goals. Prerequisite: 515 or consent of instructor.

591-592-93 Special Topics in Industrial Engineering (1-3, 1-3, 1-3) ... projects. Prerequisite: Consent of instructor. May be repeated.

594 Culminating Integrated Project Report (3) ... Engineering 594).

601 Operations Research Models in Engineering (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. Prerequisite: 518, 523.

602 Nonlinear Optimization (3) (Same as Management Science 651.)


606 Advanced Topics in Human Factors, Safety and Biomechanical Engineering (3) Application of advanced engineering analysis and design methods to human factors, safety, accident causation, and injuries, and study of injury causal mechanisms. Injury models and theories and development of injury, loss, and risk reduction techniques. Current research issues in manned systems analysis and design. Re- search into system failures; prevention of injuries. Prerequisite: Consent of instructor.

691-692-93 Advanced Topics in Industrial Engineering (3,3,3) Forum to study individually or in groups. Prerequisite: Graduate standing and consent of instructor. May be repeated with consent of instructor.
Information Sciences

(Chair of Communication and Information) MAJOR DEGREE

Information Sciences .......................... M.S.

Elizabeth Aversa, Director

Professors:
Aversa, Elizabeth, Ph.D. .......................... Drexel
Tenopir, Carol, Ph.D. .......................... Illinois

Associate Professors:
Bilal, Dania, Ph.D. ........................ Florida State
Pemberton, J. Michael, Ph.D. .......................... Tennessee
Pollard, Richard, Ph.D. .......................... Brunel (UK)
Raber, Douglas, Ph.D. ........................ Indiana
Robinson, William C., Ph.D. .......................... Illinois
Wang, Peiling, Ph.D. ........................ Maryland
Watson, Jinx, Ed.D. .......................... Vanderbilt
Whitney, Gretchen, Ph.D. .......................... Michigan

Assistant Professors:
Albright, Kendra, Ph.D. .......................... Tennessee

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 interdisciplinary program of excellence in the information sciences. Graduates of the School’s programs will be knowledgeable, skilled, and ethical users of information and information technology in their educational, professional, and personal endeavors. They will be well prepared for further study and inquiry, for leadership in the information professions, and for enlightened participation in a global information society. The School’s graduates will recognize their responsibilities to contribute new knowledge and to engage in lifelong learning in the field.”

The vision for the future of the School will be realized through:

Excellent teaching
Innovative research and
Distinguished service.

To achieve distinction in teaching, research, and service, the School is committed to:

- a forward-looking curriculum that embraces diversity in intellectual approaches to knowledge, skills, and values,
- a highly competent and diverse faculty,
- a highly competent, effective staff,
- an academically and diverse student body,
- extensive partnerships within higher education and professional communities in both private and not-for-profit sectors, service to the State of Tennessee and to the region,
- the exemplary use of state-of-the-art information technologies in both academics and administration,
- exceptional support, and collaborative and inclusive governance.

ADMISSION REQUIREMENTS

Applicants to the Information Sciences program must have a minimum undergraduate grade-point average of 3.0 or a satisfactory graduate degree grade-point average for admission as a potential candidate for the MS degree.

The verbal, quantitative and analytical aptitude portions of the Graduate Record Examination (GRE) are required of all applicants unless a graduate degree has been completed prior to application for admission. Applicants should take the GRE at least one semester in advance of application for admission and are expected to score 1500 points or better.

A personal data sheet and three recommendations (obtained from the School of Information Sciences) should be returned to the admissions office of the school. Foreign applicants are required to take the Test of English as a Foreign Language.

THE MASTER’S DEGREE

The program leading to the Master of Science involves a total of 42 semester hours of graduate courses in information sciences 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

Four courses are required of all students: 490, 520, 530, and 580. (Students seeking licensure see track requirements below.) These courses address the evolving information environment; organization and 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, web page designer, indexer/abstractor, 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.

Whatever individualized curriculum is chosen, all students who complete the program will 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 Sciences...
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 some other libraries and information agencies in the Knoxville area.

Work opportunities in a scientific-technical environment are available through subcontracts with Oak Ridge National Laboratory and the Department of Energy.

A limited number of graduate teaching assistancies are available through the school. Assistantships of this type carry a waiver of tuition and fees as well as a stipend and require that recipients work 10 hours per week in the school.

For application forms and information about financial aid and other information about the M.S. in Information Sciences, write to Admissions, School of Information Sciences, University of Tennessee, 451 Communications Building, Knoxville, Tennessee 37996-0341.

GRADUATE COURSES

430 History of the Book (3) History of writing and various methods of bookmaking.

450 Writing About Science, Technology and Medi-
cine (3) (Same as Journalism 450.)

485 Introduction to Electronic Communications and Information Resources on the Internet (3) Exploration of worldwide information and communica-
tions resources: email, newsgroups, and the world wide web. Discussion of information issues: copyright, censor-
ship, privacy and access.

486 Advanced Electronic Communications and In-
formation Resources on the Internet (3) Explora-
tion 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, pro-
duction, management, and use of informa-
tion. Roles of information in society, information seeking and user behavior, information industry, eco-
nomics of information products and services, techno-
logical and organizational change, information pro-
tessions, and issues.

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

502 Registration and Use of Facilities (1-15) Re-
nected for the student not otherwise registered during the 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.

520 Organization and Representation of Informa-
tion (3) Principles of organizing, describing, and indexing intellectual works; current approaches: cita-
tion systems, descriptive cataloging, non-subject in-
dexing, and coordinate subject indexing; classification and categorization; authority control of index terms; standards.

521 Cataloging and Classification (3) Basic library-
oriented cataloging and classification techniques, tools, and support operations. Descriptive cataloging, choice and form of non-subject entries, subject head-
ing work, general classification, authority control, bibli-
ographic utilities, online library catalogs.

522 Organization and Representation of Multi-
dia Information Resources (3) Principles and prac-
tices of description and access to information re-
ources in nonprint media and/or nontextual formats: visual, auditory, and electronic (including Internet) resources.

523 Abstracting and Indexing (3) Philosophies, standards, and procedures for manual and automatic document indexing, back-of-the-book indexing, vocabulary control, thesaurus construction, and abstracting.

530 Information Access and Retrieval (3) Media for information storage, logical and physical information structures, query logic and languages, search strate-
gies and heuristics, evaluation of retrieval system performance. Search techniques for various types of databases including multi-media, full-
text, numeric, bibliographic.

531 Sources and Services for the Social Sciences (3) Information sources in political science, sociology, psychology, geography, anthropology, busi-
ness, and education.

532 Sources and Services for Science and Engi-
neering (3) Information sources in engineering, physi-
cal and life sciences.

533 Sources and Services for the Humanities (3) Information sources in philosophy, religion, fine arts, performing arts, literature and language. Organization and management of regional collections.

534 Government Information Sources (3) Select-
ions, access, and utilization of gov-
ernment information in various formats from legisla-
tive, judicial and executive branches of federal, state, local, and international government and intergovern-
mental agencies.

535 Advanced Information Retrieval (3) Biblio-
graphic, non-bibliographic, full-text databases, e.g., non-bibliographic formula and structure databases, contents-page/full-text databases, patents; document delivery alternatives, evaluation, and testing.

537 Information Industry (3) Issues and trends concerning information industry: products and ser-
voices. 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 informa-
tion 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; de-
volution of information policy for organizations.

540 Research Methods (3) Research methods in variety of information environments; primary and sec-
ondary research; research project design; research results interpretation; analysis of published research; tech-
techniques supporting research process.

550 Management of Information Organizations (3) Supervisory and management concepts, strategies, and techniques applicable to information professional working in libraries, agencies, management, and other information organizations.
551 School Library Media Centers (3) Planning, implementing, and evaluating school library programs. Curricular involvement, role of technology, 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, colleges and universities; trends in technology, information technology, and government’s impact on public, technical, and administrative services.

553 Corporate Information Services (3) Development and present status, scope and objectives. Information resources external to organization.

554 Public Library Management and Services (3) Developmental 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 communications; 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) to meet needs of 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 they 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 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, and Technology 589.)


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 and Young Adults (3) Philosophy and objectives of public and school library services for children and young adults. Reading, listing, and viewing guidance for individuals and groups. Program planning, implementation, and evaluation. Prereq: 571 or 572.

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 informetrics; relationships with other disciplines.

581 Seminar in Radio and Television (3) (Same as Electronic Media 580.)

582 Library Automation (3) Computer-based applications; policy systems for libraries including MARC, bibliographic utilities, retrospective conversion, circulation systems, online catalogs, computer-based reference systems, and 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.

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, database administration and evaluation. Design and implementation of application using database management systems.

585 Information Technologies (3) Evolution, trends, capabilities, and limitations of technologies applied to information capture, storage, preservation, access, and distribution.

586 Information Retrieval Systems (3) Historical perspective on information retrieval research; statistical and probabilistic retrieval techniques; cognitive user modeling; expert intermediary systems; association, 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.


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.

592 Seminar in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated with consent of advisor. Maximum 6 hrs.

593 Independent Study (3-6) Prerequisite: Consent of advisor. Maximum 6 hrs.

594 Graduate Research Participation (3) Advanced research techniques under supervision of staff research director whose area coincides with interests of student. Prerequisites: Consent of advisor and research director. S/NC only.

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 8 hrs. S/NC only.

599 Practicum (3-6) Opportunity to translate theory into practice under guidance of qualified information professionals. Prerequisite: 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.

601 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 and Educational Studies**

(College of Education, Health, and Human Sciences)

**MAJOR**

**DEGREES**

Education .......................................... Ph.D.

Instructional Technology and Educational Studies ..... M.S., Ed.S., Ed.D.

---

Michael Waugh, Head

Professors:

Counts, Edward L., Ed.D. ...................... Texas A&M

Dessart, Donald J., Ph.D. ...................... Maryland

French, Russell, Ph.D. .......................... Ohio State

Hipple, Theodore W., Ph.D. ................... Illinois

Ray, John R., Ed.D. ............................. Tennessee

Thayer-Bacon, Barbara, Ph.D. ................ Indiana

Waugh, Michael, Ed.D. .......................... Georgia

Associate Professors:

Connelly, Mary Jane, Ed.D. .................... VPI

Grant, A. D., Ph.D. ............................ Wisconsin

O’Bannon, Blanche, Ed.D. ..................... Memphis

Wright, Handel K., Ph.D. ...................... Toronto

Assistant Professor:

Moyer, Diane, Ph.D. ............................. Ohio State

Emeriti Faculty:

Myer, M. E., Ed.D. ............................. Florida

Roeske, Edward L., Ph.D. .................... Ohio State

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The Department of Instructional Technology and Educational Studies offers graduate programs leading to degrees, majors, and concentrations in:

**Master of Science**

**Instructional Technology and Educational Studies**

- **Cultural Studies of Educational Foundations**
- **Curriculum**
- **Instructional Technology**

**Educational Specialist**

**Instructional Technology and Educational Studies**

- **Curriculum**
- **Instructional Technology**

**Doctor of Education**

**Instructional Technology and Educational Studies**

**Curriculum**
### THE MASTER’S PROGRAMS

**- Instructional Technology and Educational Studies • Cultural Studies of Educational Foundations Concentration**

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration :</td>
<td>15</td>
</tr>
<tr>
<td>CSED 590 (2 cr)</td>
<td></td>
</tr>
<tr>
<td>CSED 591</td>
<td></td>
</tr>
<tr>
<td>CSED 592</td>
<td></td>
</tr>
<tr>
<td>Choose one or two from the following courses:</td>
<td></td>
</tr>
<tr>
<td>CSED 511, 539, 544, 545, 549, 565 (Multicultural Education)</td>
<td></td>
</tr>
<tr>
<td>Specialization (6-12 cr):</td>
<td>9</td>
</tr>
<tr>
<td>Philosophy of Ed: CSED 526, 539, 544, 547, 548, 608, 609</td>
<td></td>
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<tr>
<td>Cultural Studies: CSED 548, 595, 609, 660, 695</td>
<td></td>
</tr>
<tr>
<td>Sociology of Ed: CSED 545, 549, 648, 652</td>
<td></td>
</tr>
<tr>
<td>History of Ed: CSED 511, 539, 546, 609, 625</td>
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</tr>
<tr>
<td>Research (6-9 cr):</td>
<td>6</td>
</tr>
<tr>
<td>CSED 560, 561, 526, 625 (2 course sequence)</td>
<td></td>
</tr>
<tr>
<td>Thesis Hours (6-9 hours):</td>
<td>6</td>
</tr>
<tr>
<td>CSED 500 or CSED 503</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>36</td>
</tr>
</tbody>
</table>

**- Instructional Technology and Educational Studies • Curriculum Concentration (Thesis/Non-Thesis)**

Program Component | Credit Hours
---|---
Core : | 3
TPTE 517 | 3
Concentration: | 15-24
Educational Foundations (approved by advisor) | |
Instructional Technology (approved by advisor) | |
CRED 535 OR CREV 560 | |
CRED 558 | |
CRED 588 | |
Electives (approved by advisor; Non-Thesis Only; 9 cr) | |
Specialization: | 3

**- Instructional Technology and Educational Studies • Instructional Technology Concentration (Thesis/Non-Thesis)**

Program Component | Credit Hours
---|---
Core: | 9
TPTE 517 | 9
One course from Educational Foundations (advisor approval) | |
One course from Curriculum (advisor approval) | |
Concentration: | 12
TECH 521 | |
TECH 570 | |
TECH 573 | |
TECH 575 | |
Electives: | 6-12
Non-Thesis: Four courses (advisor approval) | |
Thesis: Two courses (advisor approval) | |
Research: | 3
CREV 580 (non-thesis) | 3
CREV 520 (thesis) | |
Thesis: | 3
ITES 500 | |
TOTAL: | 30

**- Instructional Technology and Educational Studies • Curriculum, Research, and Evaluation Concentration**

Program Component | Credit Hours
---|---
Core: | 6
CREV 676 | 6
TECH 521 or 575 (or 600 level substitute) | |
Concentration: | 18
(Selected in consultation with advisor; maximum of 9 hours in any one of the following areas) | |
Courses in TECH, CREV OR CSED | |
Research: | 6
ITES 503 or ITES 500 | |
TOTAL: | 36

**THE EDUCATIONAL SPECIALIST PROGRAMS**

**- Instructional Technology and Educational Studies • Curriculum Concentration (Thesis/Non-Thesis)**

Program Component | Credit Hours
---|---
Core: | 6
CREV 676 | 6
TECH 521 or 575 (or 600 level substitute) | |
Concentration: | 18
(Selected in consultation with advisor; maximum of 9 hours in any one of the following areas) | |
Courses in TECH, CREV OR CSED | |
Research: | 6
ITES 503 or ITES 500 | |
TOTAL: | 30

**- Instructional Technology and Educational Studies • Instructional Technology Concentration (Thesis/Non-Thesis)**

Program Component | Credit Hours
---|---
Core: | 6
CREV 580 | 6
Thesis (Thesis-only): | 6
ITES 500 | |
TOTAL: | 33
Thesis | 30

**- Instructional Technology and Educational Studies • Cultural Studies of Educational Foundations Concentration**

Program Component | Credit Hours
---|---
Core: | 9
TPTE 517 | 9
One course from Educational Foundations (advisor approval) | |
One course from Curriculum (advisor approval) | |
Concentration: | 12
TECH 521 | |
TECH 570 | |
TECH 573 | |
TECH 575 | |
Electives: | 6-12
Non-Thesis: Four courses (advisor approval) | |
Thesis: Two courses (advisor approval) | |
Research: | 3
CREV 580 (non-thesis) | 3
CREV 520 (thesis) | |
Thesis: | 3
ITES 500 | |
TOTAL: | 30

**THE ED.D. PROGRAMS**

**- Instructional Technology and Educational Studies • Curriculum, Research, and Evaluation Concentration**

Program Component | Credit Hours
---|---
Core: | 6
CREV 676 | 6
TECH 575 | |
CREV 623 OR COUN 520, CREV 535 OR 675 | |
Electives: | 6
CREV 560, 558, 674 | |
CREV 588, 671 | |
Specialization: | 9
(Selected in consultation with advisor from approved CEHHS list.) | |
Research: | 9
(Selected in consultation with advisor) | |
CREV 561 | |
CREV 671 | |
CREV 623 | |
Seminar: | 2
CREV 604 | |
Dissertation Hours: | 24
TOTAL: | 62

*NOTE: These totals are minimums and some students may be required to complete additional coursework to overcome background deficiencies.

**- Instructional Technology and Educational Studies • Instructional Technology Concentration**

Program Component | Credit (Units)
---|---
Core: | 12
Students entering the Ed.D. program with a concentration in IT must hold a master’s degree in IT or closely related field OR complete pre-requisite courses listed below OR show evidence of comparable course work or
work experience.
TECH 521
TECH 570
TECH 573
TECH 575

Core:
TECH 678
CREV 604 (2 cr)

Concentration: 18
(Selected in consultation with advisor)

Specialization: 9
(Selected in consultation with advisor from approved CEHHS list)

Research: 9
(Selected in consultation with advisor from approved CEHHS list)

Dissertation Hours: 24

TOTAL*: 81

*NOTE: These totals are minimums and some students may be required to complete additional coursework to overcome background deficiencies.

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THE PH.D. CONCENTRATIONS

**Education** • Cultural Studies of Educational Foundations Concentration

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Credit (Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core:</td>
<td>11</td>
</tr>
<tr>
<td>Cult Std 607</td>
<td></td>
</tr>
<tr>
<td>Ed Adm Pol Std 605</td>
<td></td>
</tr>
<tr>
<td>Ed Psych 609</td>
<td></td>
</tr>
<tr>
<td>EDUC 601 (2cr)</td>
<td></td>
</tr>
</tbody>
</table>

| Concentration:     | 16           |
| (from the following and approved substitutions) | |
| CSED 590 (4 cr)   |              |
| CSED 591          |              |
| CSED 592          |              |
| CSED 595 (Multicultural Education) | |
| CSED 609          |              |

| Specialization:    | 9            |
| (from one of the following areas) | |
| Philosophy of Ed: CSED 526, 539, 544, 547, 548, 608 | |
| Cultural Studies: CSED 560, 561, 592, 549, 609, 660, 695 | |
| Sociology of Ed: CSED 545, 549, 648, 652 | |
| History of Ed: CSED 511, 539, 546, 609, 625 | |

| Research:          | 15           |
| (from the following and approved alternatives) | |
| CSED 560, 561, 625, 531 | |

| Cognate:           | 6            |
| (Selected in consultation with advisor) | |

Dissertation Hours: 24

TOTAL*: 83

*NOTE: These totals are minimums and some students may be required to complete additional coursework to overcome background deficiencies.

---

**Education** • Instructional Technology Concentration

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Credit (Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Pre-Requisites:</td>
<td>12</td>
</tr>
<tr>
<td>Students entering the Ph.D. program with a concentration in IT must hold a Master’s degree in IT or closely related field OR complete pre-requisite courses listed below OR show evidence of comparable coursework</td>
<td></td>
</tr>
<tr>
<td>TECH 521</td>
<td></td>
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<tr>
<td>TECH 570</td>
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<tr>
<td>TECH 573</td>
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<tr>
<td>TECH 575</td>
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<tr>
<td>College Core:</td>
<td>11</td>
</tr>
<tr>
<td>TECH 678</td>
<td></td>
</tr>
<tr>
<td>EDUC 601</td>
<td></td>
</tr>
</tbody>
</table>

One course from Theoretical Foundations and/or Applications

One course from Philosophy of Science OR

History and Philosophy of Education

Concentration: 15
(Selected in consultation with advisor)

Specialization: 9
(Selected in consultation with advisor from approved CEHHS list)

Cognate: 6
(Selected in consultation with advisor)

Research: 15
(Selected in consultation with advisor from approved CEHHS list)

Dissertation Hours: 24

TOTAL*: 80

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**Education** • Curriculum, Research, and Evaluation Concentration

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Credit (Units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Pre-Requisites:</td>
<td>11</td>
</tr>
<tr>
<td>Core: Other College Core Requirements</td>
<td></td>
</tr>
<tr>
<td>EDUC 601 (2 cr)</td>
<td></td>
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</tbody>
</table>

Concentration: 12

Required:
CREV 676
TECH 575 or TECH 521
CREV 623 or 520
CREV 535 or 675

Elective:
CREV 558, 560, 588, 671 674

Specialization: 9
(Selected in consultation with advisor)

Research: 15
(from the following and approved substitutions)
CREV 561
CREV 671
CREV 623
CSED 560
Educational Psychology 520
Educational Psychology 563
CREV 520

Cognate: 6
(Selected in consultation with advisor)

Dissertation Hours: 24

TOTAL*: 83

*NOTE: These totals are minimums and some students may be required to complete additional coursework to overcome background deficiencies.

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**Cultural Studies in Education**

**GRADUATE COURSES**


526 Philosophy of Education (3) Description, interpretation, and critique of philosophies of multicultural and gender-sensitive constructive thinking; confronting power and addressing educational implications.

539 Development of Education Thought (3) Historic and philosophic approach to lives and writing of influential educators: Plato, Quintillian, Comenius, Rousseau, Pestalozzi, Froebel, Dewey. Prereq: Graduate status and consent of instructor.

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.

546 Topics in History of Education (3) May be repeated.

547 Topics in Philosophy of Education (3) May be repeated.

548 Transforming Critical Thinking: Constructive Thinking and Educational Implications (3) Critique and transformation of critical thinking to more holistic, relational, and aesthetic models 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.

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, oral and life history. Critical reading and evaluation of qualitative research studies.

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.

590 Cultural Studies Seminar (1) Two-semester sequence (fall and spring); ongoing discussion about cultural studies; popular culture, interdisciplinary work, social justice issues. Presentations, videos, readings. May be repeated. Maximum 4 hrs. S/NC only.

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 opportunity to acquire social goods and benefits. Prereq: Admission to doctoral program with concentration in cultural studies in education.

607 Advanced Seminar in the Social Foundations of Education (3) Interdisciplinary team-taught seminar. Readings selected by faculty and participants from classic studies and current periodical literature in anthropology, sociology, history, and philosophy of
### Curriculum Educational Research and Evaluation

**GRADUATE COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>520</td>
<td>Techniques of Research in Education (3) Study and application.</td>
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<tr>
<td>532</td>
<td>Instructional Research: Analysis and Application (3) Analysis of research on instruction. Transla-</td>
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<tr>
<td>534</td>
<td>Program Evaluation in Education (3) Issues and practices in planning and conducting program and</td>
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<tr>
<td>552</td>
<td>School Law for Educators (3) Case and statutory material for public school educators; problems</td>
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<tr>
<td>557</td>
<td>The Junior High and Middle School Curriculum (3) Curriculum and instructional design for junior high and</td>
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<tr>
<td>558</td>
<td>Curriculum Planning and Development (3) Foundations and principles of curriculum planning and</td>
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<tr>
<td>560</td>
<td>Student Assessment (3) Processes for assessing and reporting student progress; interpretation and</td>
<td></td>
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<tr>
<td>561</td>
<td>Educational Statistics (3) Applications of descriptive and inferential statistics to educational and</td>
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<tr>
<td>580</td>
<td>Techniques for Research in Curriculum and Instruction (3) Fundamentals of research methodology</td>
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</table>

### Instructional Technology

**GRADUATE COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>521</td>
<td>Computer Applications in Education (3) Use and integration of technology in educational settings</td>
<td></td>
</tr>
<tr>
<td>566</td>
<td>Administering Instructional Media Programs (3) Leadership roles and responsibilities of professional</td>
<td></td>
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<tr>
<td>569</td>
<td>Media and Technology Production Techniques (3) Workshop strategy: basic photography, audio and video</td>
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<tr>
<td>570</td>
<td>Instructional Systems Design (3) Application of theory and research of instructional systems design</td>
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<tr>
<td>571</td>
<td>Desktop Publishing for Educators (3) Use of computer-based desktop publishing and graphics software</td>
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<tr>
<td>572</td>
<td>Introduction to Multimedia in Instruction (3) Selected computer-based multimedia production tools and</td>
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</tbody>
</table>

### Instructional Technology and Educational Studies

**GRADUATE COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>500</td>
<td>Thesis (1-15)</td>
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<tr>
<td>502</td>
<td>Registration for Use of Facilities (1-15) Required for the student not otherwise registered during</td>
<td></td>
</tr>
<tr>
<td>593</td>
<td>Independent Study (1-3) May be repeated. S/NC or letter grade</td>
<td></td>
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<tr>
<td>594</td>
<td>Supervised Readings (1-3) May be repeated. S/NC or letter grade</td>
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<tr>
<td>595</td>
<td>Special Topics (1-3) May be repeated. S/NC or letter grade</td>
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<tr>
<td>600</td>
<td>Doctoral Research and Dissertation (3-15) P/ NP only</td>
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<tr>
<td>689</td>
<td>Internship (1-3) Experiences in application of principles and practices of curriculum development</td>
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<tr>
<td>693</td>
<td>Independent Study (1-3) May be repeated. Maximum 9 hrs. S/NC only</td>
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</tbody>
</table>
694 Supervised Reading (1-3) May be repeated. S/NC or letter grade.
695 Special Topics (1-3) May be repeated. S/NC or letter grade.

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
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.)
461 Art of Southern and Eastern Africa (3) (Same as Art History 461.)
462 Art and Archaeology of Ancient Africa (3) (Same as Art History 462.)
463 Arts of the African Diaspora (3) (Same as Art History 463.)
473 Black Male in American Society (3) Development of historical images, myths and stereotypes, impact of critical factors: Black feminism, violence, concepts of masculinity, family, white males, white females, homosexuality, nationalism, and athletics.
483 African-American Women in American Society (3) Historical and contemporary socio-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.)

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.)
433 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 489.)
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 Disenchantments 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 Communication 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.)
435 Criminal Law and Procedure (3) (Same as Political Science 435.)
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 Linguistics 490.)
496 The Rhetoric of Legal Discourse (3) (Same as English 496.)

Linguistics

Graduate Certificate in Linguistics

The Linguistics Program offers a graduate certificate, designed to meet the needs of individuals wishing to apply linguistics in various professional fields. It draws upon the strengths of faculty members in applied linguistics, sociolinguistics, and theoretical linguistics. The requirements focus upon the central aspects of the discipline of Linguistics and aim to develop students’ basic knowledge and skills in the central aspects of the discipline.

Upon successful completion of this program, students should have an understanding of the basic theoretical concepts and approaches of the discipline and have gained experience in the use of analytic and research techniques. It is also designed to meet the specific needs of those students who are preparing to teach foreign language at the high school/junior college level and/or to obtain advanced level proficiency in linguistics and cultural knowledge.

Prospective candidates for the certificate may take up to 6 hours of certificate classes before making application for admission to the Certificate Program. Once admitted to the program they must maintain a GPA of at least 3.0. Application to the Certificate Program must be made to the Chair of the Interdisciplinary Linguistics Program by submitting a letter of application and copies of undergraduate transcripts (and graduate transcripts, if applicable). A minimum of fifteen credit hours is required; all courses must be selected in consultation with a program advisor, who must approve all courses for individual
students prior to their being taken, except that, as noted above, up to six credit hours may be accepted from candidates upon admission. Students will satisfy the requirements of the Certificate Program by selecting fifteen hours from the following lists, provided that those courses are selected in consultation with a program advisor, who approves their selection. A certificate cannot be earned without program approval by the advisor.

Certificate Requirements

1. At least one of the following courses: French 512, German 512, Spanish 512, Linguistics 432, 425.
2. Additional courses from the following list for a total of fifteen credit hours: Audiology and Speech Pathology 506, 579, 601, 652, English 508, 509, 680, French 421, 422, 510, German 510, 541, 631, 632, Linguistics 400, 411, 426, 429, 435, 471, 472, 474, 475, 476, 477, 485, 490, Spanish 531, Psychology 400, 543, 617, Statistics 531. Other courses may, where appropriate, be substituted for the courses listed above with the permission of the Chair of the Linguistics Program.
3. A non-credit capstone project, normally the preparation of a paper for presentation at a professional conference or for publication in a journal, planned and completed in consultation with a program advisor.

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 430.)
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 Certificate in Medieval Studies

The Medieval Studies program offers a graduate certificate enabling students with an interest in medieval topics to acquire a broad foundation in the interdisciplinary approaches to medieval research and to begin putting these approaches into practice. For students earning MAs or PhDs in traditional disciplines, the program will augment their training and may make them more attractive candidates for academic positions. Prospective candidates for the certificate may take up to 6 hours of certificate classes before making application for admission to the Certificate Program. Once admitted to the program they must maintain a GPA of at least 3.0. Application to the Certificate Program must be made to the Chair of the Medieval Studies Program by submitting a letter of application and copies of undergraduate transcripts (and graduate transcripts, if applicable). A minimum of fifteen credit hours is required; all courses must be selected in consultation with a program advisor, who must approve all courses for individual students prior to their being taken, except that, as noted above, up to six credit hours may be accepted from candidates upon admission. Students will satisfy the requirements of the Certificate Program by selecting fifteen hours from the following lists, provided that those courses are selected in consultation with a program advisor, who approves their selection. A certificate cannot be earned without program approval by the advisor.

Certificate Requirements

1. Medieval Studies 510.
2. Twelve additional hours chosen from at least two disciplines. A minimum of six hours must be taken within one discipline. Students may choose from the following courses: Art History 425, 431, 441, 451, 571, English 401, 402, 508, 513, 514, 610, 611, 620, 621, French 410, 429, 540, German 541, History 531, Italian 401, 402, Spanish 531, 532, Philosophy 520, 620, Political Science 475. Topics and special topics courses, where appropriate, may be substituted for any of the above courses with the permission of the Chair of the Medieval Studies Program.
3. Demonstration of competency in reading medieval Latin, either by earning an “A” or “B” in Classics 435, or by passing the University of Toronto’s MA Medieval Latin exam, given on campus in Fall and Spring semesters. Where appropriate, students may substitute competency in reading medieval Greek, Hebrew, or Arabic. The chair of Medieval Studies, in conjunction with the Medieval Studies committee, will establish standards for determining competency in these languages as need arises.
4. A non-credit capstone project, usually a paper. The paper should be interdisciplinary in its approach to its topic and may be an outgrowth of a seminar paper in another course. This capstone paper must be presented to an audience of Medieval Studies committee members and other interested faculty and graduate students before the certificate is granted.

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.)
441 Urban Geography of the United States (3) (Same as Geography 441.)
464 Urban Ecology (3) (Same as Sociology 464.)

Women’s Studies

Graduate Certificate in Women’s Studies

The Women’s Studies program offers a graduate certificate, enabling students to develop critical thinking about the economic, social, and legal factors influencing women’s roles in contemporary and historical societies, and to evaluate those roles in the widest possible perspectives. Students may examine representations of women in the arts and the media, evaluate how science and medicine view women as objects of study, and study how women work as practitioners and researchers in these fields. The program is designed to provide a supplementary perspective for students already enrolled in graduate programs, to provide an entry into graduate study for those who are exploring a number of disciplinary approaches, to provide enrichment for members of the community who have a BA or an advanced degree, and to develop skills for professionals in various fields. Prospective candidates for the certificate may take up to 6 hours of certificate classes before making application for admission to the Certificate Program. Once admitted to the program they must maintain a GPA of at least 3.0. Application to the Certificate Program must be made to the Chair of the Women’s Studies Program by submitting a letter of application and copies of undergraduate transcripts (and graduate transcripts, if applicable). A minimum of fifteen credit hours is required; all courses must be selected in consultation with a program advisor, who must approve all courses for individual students prior to their being taken, except that, as noted above, up to six credit hours may be accepted from candidates upon admission. Students will satisfy the requirements of the Certificate Program by selecting fifteen hours from the following lists, provided that those courses are selected in consultation with a program advisor, who approves their selection. A certificate cannot be earned without program approval by the advisor.

Certificate Requirements

1. Women’s Studies 510.
2. Twelve additional hours, drawn from at least two different disciplines. For students enrolled in an MA program, no more than two of the certificate courses may be drawn from
that program or the department in which the MA program is housed. Students are encouraged to select from courses at the 500 level and above. Students may choose from the following list: Anthropology 517, English 584, Health 420, 520, Public Health 585, Law 449, 862, 958, Women’s Studies 400, 410, 422, 425, 434, 466, 469, 476, 483, 510, 593.

3. A capstone experience such as presenting research results to a professional group, submitting a work for publication, arranging an exhibit, or presenting a performance to a group approved by the individual advisor and the chair of 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 Educational Psychology and Counseling 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 and Electronic Media**

(College of Communication and Information)

**MAJOR**

Communication ................................. M.S., Ph.D.

David L. Smith, Director

Professors:  

Associate Professors:  

Assistant Professors:  
Kaye, Barbara, Ph.D. .......... Florida State Luther, Catherine, Ph.D. .......... Minnesota Emeriti Faculty:  

The School of Journalism and Electronic Media offers concentration areas for the master’s with a major in Communication and participates in the interdisciplinary doctoral program. See Communication for additional information.

**Electronic Media**

**GRADUATE COURSES**

440 Corporate Video (3) Special requirements of business, industrial, educational, and medical uses of video. Management, budgeting, producing, and postproduction 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, Broadcast, and Interactive Digital Media (3) History and structure of cable television and other broadcast delivery systems: DBS, Internet, Development of digital broadcasting, interactive television, 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.


498 Internship (3) Full-time (30 - 40 hrs per week) work experience 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.


560 Electronic Media and Telecommunications Law and Policy (3) Law, regulation, and policy in broadcasting and telecommunications (cable, telephone, Internet). Philosophy of regulatory policy formulation role of FCC and ITU, and international treaties. Prerequisites: consent of instructor or admission to program.

570 Broadcast and Internet Research (3) Practical and professional application of research methods. Applied audience and market research. Overview of techniques, research design, data collection and analysis, and application to management decision making.

**Use of internet for data collection. Prereq: Communications 512 or 612, or consent of instructor.**

580 Seminar in Radio and Television (3) Salient issues in broadcasting. Topics vary. International broadcasting, cable television, new technologies, corporate television, educational and public broadcasting, and society. Prereq: Consent of instructor or admission to program. May be repeated. Maximum 6 hrs. (Same as Information Sciences 581.)


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

**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 practices 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.


433 Advanced Editing (3) Sensitivity to language and editing skills. Headline writing, layout, and production. Prereq: Editing.

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 and interviews of experts in environmental science and reporting. Exemplary popular literature in
environmental reporting. Prereq: Editing for majors; consent of instructor for non-majors.

455 Issues in Science Communications (3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

456 Science Writing as Literature (3) Survey of important science writing for general public across spectrum of science, engineering, and medicine. Works by authors such as Arthur C. Clarke, Stephen J. Gould, and Richard Selzer. Analysis of literary qualities in quest to understand why some science writing succeeds. Prereq: Consent of instructor.


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 Photographic Techniques (3) Advanced principles and methods of black-and-white photography. Introduction to color photography. News and feature photographs and photo essays. Prereq: Photographic or consent of instructor.

520 Political Communications (3) Relationships among mass media, public relations and government and their roles in democratic society. Governmental public relations, political campaigns, executive, legislative and judicial branches of government, special interest groups and public access to government information. (Same as Public Relations 520.)

525 Public Opinion (3) Role of press in developing and influencing publics 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, 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.

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 other design elements. Prereq: Editing or Advertising 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.

Law

MAJOR DEGREES

Law .................... J.D., J.D.-MBA, J.D.-M.P.A.

Thomas C. Galligan, Jr., Dean

Professors:

Ansley, Frances Lee, LL.M. .......... Harvard
Best, Reba, M.L.S. .................. Florida
Blaze, Douglas A., J.D. .......... Georgetown
Cohen, Neil P., LL.M. .......... Harvard
Cook, Joseph G., LL.M. .......... Yale
Davies, Thomas Y., J.D. ........ Northwestern
Galligan, Jr., Thomas C., LL.M. ....... Columbia
Hardin, Patric, J.D. .............. Chicago
Hess, Amy M., J.D. ............... Virginia
King, Joseph H., J.D. .......... Pennsylv.
Lloyd, Robert M., J.D. .......... Michigan
Phillips, Jerry J., J.D. ............. Yale
Picquet, Cheryn, M.S.L.S. .......... Tennessee
Plank, Thomas E., J.D. .......... Maryland
Reynolds, Glenn H., J.D. .......... Yale
Rivkin, Dean H., J.D. .......... Vanderbilt
Sobieski, John L., Jr., J.D. .......... Michigan
Stark, Barbara, J.D. .......... New York University
Stein, Gregory M., J.D. .......... Columbia
Stevens, Ol, J., Tenn, Tennessee
Wirtz, Richard S., J.D. .......... Stanford
Zwier, Paul J., II, LL.M. ........ Temple

Associate Professors:

Aarons, Dwight, J.D. .......... UCLA
Anderson, Gary L., LL.M. .......... Harvard
Barlow, Doris L., J.D. .......... Michigan
Beintema, William J., J.D. .......... Miami
Black, Jerry P., Jr., J.D. .......... Vanderbilt
Cornett, Judy M., J.D. .......... Tennessee
Heminway, Joan M., J.D. .......... New York
Jacobs, Becky L., J.D. .......... Georgia
Kennedy, Deseree A., LL.M. .......... Temple
Kuney, George W., J.D. .......... California (Hastings)
Leatherman, Don A., LL.M. ......... New York
Marlowe, Susanna, J.D.,Washington (St.
Louis
Medill, Colleen E., J.D. .......... Kansas
Parker, Carol M., J.D. .......... Illinois
Pierce, Carl A., J.D. .......... Yale
Pucilowski, Sunny H., J.D. .......... California (Boalt Hall)
White, Penny J., LL.M. .......... Georgetown
Williams, Paulette J., J.D. .......... New York University

Assistant Professors:

Cochran, Cathleen R., M.S. .......... Tennessee
Collins, Carol Morgan, M.S. .......... Tennessee
Mark, Joseph, J.D. .......... Loyola
Price, Loretta, M.S.L.S. .......... Tennessee

Emeriti Faculty:

Gray, Grayfred B., J.D. .......... Vanderbilt
Le Clercq, Frederic S., LL.B. .......... Duke
Sewell, Toxey H., LL.M. .......... George Washington

The College of Law offers the Doctor of Jurisprudence degree program; a dual degree program with the College of Business Ad-ministration leading to the J.D. and the Mas-ter of Business Administration degree; and a dual degree program with the Depart-ment 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 Avenue, Knoxville, Tennessee 37996-1810 and at the College's web page www.law.utk.edu. 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-. Eligible law students may receive up to six (6) semester hours of credit toward the J.D. degree for acceptable performance (a grade of B or higher) in upper-level courses that materially contribute to the study of law and which are taken in other departments at The University of Tennessee. Course selection and registration are subject to guidelines approved by the law faculty which include the requirement that any such course be acceptable for credit toward a graduate degree in the department offering the course. Refer to the Law Catalog and Student Handbook for current degree requirements.

Concentration in Business Transactions

Students interested in a concentration in business transactions must complete all of the following law courses:

818 Fundamental Concepts of Income Taxation
826 Introduction to Business Transactions*
827 Business Associations
972 Income Taxation of Business Organizations
940 Land Finance Law
840 Commercial Law
862 Contract Drafting Seminar
833 Representing Enterprises or
978 Transactional Tax Planning

*This 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. It 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
920 Trial Practice
921 Pretrial Litigation
922 Advanced Trial Advocacy
928 Case Development and Resolution

Law
Students electing a concentration in advocacy and dispute resolution may not take any of the above courses in 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 Jurisprudence and the Master of Business Administration.

The establishment of the dual program recognizes the increasingly complex body of knowledge necessary to the creative conduct of business and business-related law practice, the complementary nature of many aspects of the graduate programs of the College of Law and the College of Business Administration, and the intellectual benefits inherent in the concurrent study of both business and business-related law. The program is designed to accommodate the interests of students who (a) contemplate a career in public service and want to acquire the skills and perspective of the lawyer and the business-oriented manager, (b) contemplate a career in business management and want to acquire the skills and perspective of a lawyer, or (c) consider 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 degree 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. 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, the dual program recognizes the increasingly complex body of knowledge necessary to the creative conduct of business and business-related law practice, the complementary nature of many aspects of the graduate programs of the College of Law and the College of Business Administration, and the intellectual benefits inherent in the concurrent study of both business and business-related law. The program is designed to accommodate the interests of students who (a) contemplate a career in public service and want to acquire the skills and perspective of the lawyer and the business-oriented manager, (b) contemplate a career in business management and want to acquire the skills and perspective of a lawyer, or (c) consider a career as a lawyer specializing in business-related law and want to acquire the skills and perspective of the business-oriented manager.

**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 B grade or higher and are to be counted toward the MBA must be selected from those approved by the Asst. Dean of the MBA Program.

**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 joint conferral of both the Doctor of Jurisprudence and Master of Public Ad-ministration 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 intern-ship 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 used to 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 degree 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 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. coordinators in both academic units. In the third and fourth years, students are strongly encouraged to take both law and political science courses each semester.

Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

**Awards of Grades**

For grade recording purposes in the College of Law 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 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 dual program, 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 below a C, 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 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 the 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 will be shown on the permanent record.

PROFESSIONAL COURSES

801 Civil Procedure I (3) Binding effect of judgments, selective jurisdiction and abstention, precluding applicable law, and federal and state practice.


803 Contracts I (3) Basic agreement process and legal protections afforded contracts: offer and acceptance, consideration and other bases for enforcing promises; the Statute of Frauds, unconscionability and other controls of promissory liability in the adhesion 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; unconscionability, impracticability 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, professional malpractice, and liability of owners and occupiers of land; defenses based on plaintiff's conduct; contributory and comparative negligence; assumption of risk, failure to take precautions, and avoidable consequences; causation, proximate cause; duty rules and questions of joint and several or 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; immunities: 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, competency, 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, 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 income tax, individual and corporate income tax concerns that arise in practice. Federal concept of gross income, pattern of exclusions, exemptions and deductions from gross income used to arrive at tax 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 decisions: procedural standards for informal and formal administrative adjudication and rulemaking (attention to General Administrative Act); constitutional due process 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.


827 Business Associations (4) Legal problems associated with formation, operation, and dissolution of unincorporated and incorporated business firms; legal rights of duties of firm members; principals and agents, partners and limited partners, members, managers, and governors of limited liability companies, and corporate shareholders, directors, and officers; and others with whom firms interact in connection with firm's business.

828 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 other insiders; 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 drafting project. Transactions vary: formation of new entity; business law corporate transactions; development of real estate project; various financing transactions and corporate reorganization. Prereq: Completion of all courses for concentration in business transactions. 

834 Antitrust (3) Federal antitrust laws; monopolization, price-fixing, group boycotts, 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: security interests in personal property (Art. 9 of U.C.C. and relevant Bankruptcy Code provisions); commercial paper, including checks, notes and other negotiable instruments (Art. 3 of U.C.C.); sales of goods, including coverage of portions of Art. 2 of U.C.C. not covered in Contracts.

842 Contract Drafting Seminar (2) Practical fundamentals of drafting contracts of different types.

843 Debtor-Creditor Law (3) Basic elements of federal bankruptcy law: claims, property of estate, automatic stay, creditor’s avoidance powers, assumptions and rejections of contracts, priority of distributions, and distinction between liquidation and rehabilitation. Enforcing judgments outside of bankruptcy.

847 Advanced Constitutional Law (2-3) Advanced study of issues in American constitutional law. Specif- cific course offerings vary. Subjects include: constitu- tional structure of American governmental institutions, American governmental powers: relation- ship between legislative and executive branches, relationship among states and between states and federal government, and constitutional amendment process; state constitutional law, Tennessee constitu- tion and differences between state and federal constitu- tional law; Bill of Rights and 14th Amendment to Constitutional law as impacted by Bill of Rights and 14th Amendment. Prereq: 812. May be repeated under different topic.

848 Civil Rights Actions (3) Litigation to vindicate constitutional rights in private actions against the government, and its agents and other private actors protected by other civil rights legislation: elements of cause of action under 42 U.S.C. sec. 1983; actions against federal government officials under the Bivens doctrine; institutional and individual immunities; relation- ship between state and federal courts in civil rights actions; and remedies for violations of constitutional and other civil rights.

849 Discrimination and the Law (3) Comparison of race, sex, and other forms of discrimination with respect to education, employment, housing, political participation and other civil rights. Emphasis on civil rights and other activities, historical landmarks and current issues in discrimination law.

850 Supreme Court (3) History of Supreme Court and procedures by which Court arrives at decisions; influence of justices’ ideology and role of Court in political system.

854 Investigatory Criminal Procedure (3) Police practices and constitutional rights of persons charged with crimes: arrest; search and seizure; identification; interrogation; and confessions; electronic eavesdropping; and right to counsel.

855 Adjudicatory Criminal Procedure (3) Pre- and post-trial procedures in criminal case: bail; preliminary hearing; grand jury; prosecutorial discretion; discovery pretrial; plea negotiations and double jeopardy. Federal Rules of Criminal Procedure.

859 Criminal Law Seminar (2) Advanced problems in criminal law and administration of justice. Prereq: 809.

862 Family Law (3) Survey of laws affecting formal and informal family relationships: premarital disputes; antenuptial contracts; creation of common law and formal marriage; legal effects of marriage; support obligations within family; legal separation, annulment, divorce, alimony, and property settlements; child custody and child support; adoption; illegitimacy.

863 Children and the Law (3) Legal relationships between children, families and state; juvenile justice; foster care; adoption; educational issues: special education; child abuse and neglect; health care and income maintenance; advocacy for children and families.

866 Environmental Law and Policy (3) Study, through methods of public policy analysis, of responses of federal and state legislative, administrative, and judicial decision-making processes and judicial review of administrative decisions by which Court arrives at decisions; influence of justices’ ideology and role of Court in political system.

867 Environmental Law Seminar (2) Selected topics in environmental law.

873 American Legal History (3) Selected topics in American legal history.

877 Jurisprudence (3) Critical or comparative examination of legal theories, concepts, and problems; legal
positionism; natural law theory; legal realism; idealism; historical jurisprudence; utilitarianism; Kantianism; sociological jurisprudence; policy science; and critical studies.

679 Law and Economics (3) The relationship between legal and economic institutions, and the application of basic economic concepts to legal problems; economics in legal decisionmaking; scholarly support for and criticism of economic analysis of law. Designed for students with no undergraduate background in economics or mathematics.

881 Law and Literature (3) Reading literary works, development of philosophy and reading technique applicable to both law and life.

886 Public International Law (3) Law creating processes and doctrines, principles and rules of law that regulate mutual behavior of states and other entities in international system.

887 International Business Transactions (2-3) Doing business with foreign persons and in foreign countries; acquisition and use of property within foreign country; regulation of international business transactions by international organizations and foreign governments; analysis of international conventions and laws of foreign countries affecting business and comparison of those conventions and laws with United States law.

895 Labor Relations Law (3) Problems in social and economic interrelations in the employment of federal labor relations; employees' rights of self-organization; union and employer unfair labor practices; strikes, lockouts, boycotts and collective bargaining processes; enforcement of collective agreements; individual rights of employees; federal preemption and state regulation.

896 Employment Law (3) Legal regulation of employee relations; legal, social and economic influences in employment-employee relationships; union and employer unfair labor practices; strikes, lockouts, boycotts and collective bargaining processes; enforcement of collective agreements; individual rights of employees; federal preemption and state regulation.

898 Arbitration Seminar (2) Arbitration of labor agreements; judicial and legislative developments; nature of process; relationship to collective bargaining; selected arbitration problems on various topics under collective agreements; and role of lawyers and arbitrators.

899 Labor Relations Seminar (2) Selected labor relations law problems. Prereq. 895.

905 Advocacy Clinic (6) Supervised fieldwork requiring students to assume substantial responsibility for representing clients with various civil and criminal legal problems. Exploration and development of fundamental principles involved in basic trial strategy law: interviewing and counseling clients, negotiating with other attorneys, planning for transactions and dispute resolutions, initiating and defending claims, conducting factual investigations, and presenting evidence. Prereq. 920 and third-year standing. May not receive credit for both 905 and 946 or both 905 and 947.

908 Mediation Clinic (3) Mediation process, theory, strategy, tactics and skills through readings, simulations, and service as mediators in general sessions court and other settings: mediation ethics, relationship of mediator to other resolution methods, roles of attorneys in mediation, and writing of mediation agreements.

915 Conflict of Laws (3) Jurisdiction, foreign judgments, and conflict of laws.

916 Federal Courts (3) Jurisdiction of federal courts; method of considering conflicts between federal and state courts.

918 Remedies (3) Judicial remedies; damages, restitution, and equitable relief; availability, limitations and measurement of various remedies; comparison of contract, tort and property-related remedies.

920 Trial Practice (3) Litigation through simulation, trial procedure, basic strategy, professional responsibility; fact investigation and witness preparation; discovery and presentation of evidence; selection and instruction of juries; opening and closing arguments. Written work: pleadings, motions, interrogatories or memoranda. Coreq. 813 for students electing concentration in advocacy. Prereq. 813 for all other students. Third-year standing. Prereq. 813, 920, and either 854 or 855, and consent of instructor. May not receive credit for both 947 and 905.

921 Pre-Trial Litigation (3) Civil pre-trial process. Drafting of actual pre-trial documents in civil cases: complaint, motions for preliminary injunction, class certification papers, summary judgment and various discovery papers.

922 Advanced Trial Advocacy (3) Study and development of trial skills: trial preparation, advanced direct and cross-examination, expert witnesses, jury selection, jury instructions, technology in courtroom, and motion practice. Prereq. 920.

927 Interviewing, Counseling and Negotiation (3) Development of conceptual and practical frameworks for understanding interviewing, counseling and negotiation as legal skills. Examination of different methods, strategies and perspectives from recent literature involving lawyering skills. Simulations and videotape critiques of documents, oral and written ethical issues and techniques of dispute resolution. Not open to students who have taken 904 or 906.

928 Case Development and Resolution (4) Theory and development of skills for case management in litigation practice, including fact investigation. Ways of resolving disputes without litigation. Not open to students who have taken 927.

935 Gratuitous Transfers (3) Gifts; will substitutes: nature, creation, termination and modification of trusts; intestate and surviving spouses' rights; probate and contest of wills; statutory protections against disinheritance; and introduction to powers of appointment, basic probate procedure, uniform probate code, attorney for a minor, and business law problems of charity, trusts, charitable organizations, and charitable donations. Prereq. 706, 900, or 955. Recommended prereq: 810.

940 Land Finance Law (3) Financing devices: mortgaging of real estate; debt instruments and priorities; transfer of secured interests when debt assumed or taken subject to security interest; default, exercise of equity of redemption and statutory right of redemption; mechanics and materialmen's liens, contemporary developments in areas as condominiums, cooperatives, housing subdivisions, and shopping centers.

941 Land Acquisition and Development Seminar (3) Analyses of recent legislative and administrative developments in land acquisition, condemnation, eminent domain, and development of skills for case development and presentation. Prereq. 942 or 946.

942 Land Use Law (3) Private land use controls: nuisance, easements, real covenants, equitable servitudes. Home owner associations, zoning, subdivision controls, eminent domain, and regulatory takings.

946 Business Law Clinic (6) Supervised fieldwork representing clients in corporate and business matters, with a focus on analyzing and representing clients with various business and transactional matters. Exploration and development of fundamental professional skills involved in practicing business and transactional law. Development and practice of legal skills, negotiation and drafting of documents essential in large commercial development. Prereq. 940.

943 Land Use Law (3) Private land use controls: nuisance, easements, real covenants, equitable servitudes. Home owner associations, zoning, subdivision controls, eminent domain, and regulatory takings.

946 Business Law Clinic (6) Supervised fieldwork representing clients in corporate and business matters, with a focus on analyzing and representing clients with various business and transactional matters. Exploration and development of fundamental professional skills involved in practicing business and transactional law. Development and practice of legal skills, negotiation and drafting of documents essential in large commercial development. Prereq. 940.


950 Computers and Law (3) Impact of computers on legal practice of law; expert systems; legal skills required in building expert systems; common law office uses of computers; and computerized research. Preparation of lawyers to think effectively concerning use of computers. Prior computer experience not necessary.

956 Entertainment Law (3) Role of law and lawyer in entertainment industry. Course content varies. Music industry; music copyright laws; artist/manager relationships; recording contract negotiations; industry labor unions; and performing right organizations.

957 Law, Science and Technology (3) Legal implications of advanced technologies; adaptation of law to challenges posed by new kinds of knowledge and new ways of doing things. Biotechnology, regulation of scientific research, space law, legal issues relating to new information technologies, nanotechnologies, and other issues created by new technologies.

958 Women and The Law (3) Treatment and status of women in American legal system: women as political actors, as family members, as participants in workforce, as targets of violence and as members of legal professions; introduction to current competing approaches to gender justice.

959 Intellectual Property (3) Intellectual property and related interests under federal and state law: patents; trademarks; trade secrets; copyright; right of publicity; unfair competition.

960 Employee Benefits Law (2-3) Employee Retirement Income Security Act, federal law governing employee benefit plans sponsored by private employers. Applied problem method of instruction: questions, issues, and problems involving employee benefit plans likely to arise in general litigation or business transaction practice. For three credit hours, includes Chapter 41 of Internal Revenue Code.

962 Law and Medicine Seminar (2) Effects of legal rules on delivery and quality of medical care: nature of physician-patient relationship; unauthorized practice of medicine; medical education, licensing and specialization; hospital staff privileges; medical malpractice; liability: standard of care, proof, causation, defenses, and damages; protection of patient autonomy: consent, informed consent, consent and abortion, choice of treatment, and death and dying; control of communicable diseases; organ transplantation and medical resource allocation.

972 Income Taxation of Business Organizations (3) Taxation of partnerships, S corporations, and other general and special forms of business organization. Comparison of taxation patterns of income taxation of partnerships, subchapter C corporations, subchapter S corporations, and limited liability companies; introduction to transactional analysis and business planning. Required written examination of law that may be attempted by students who have taken 879, 890, 922, and 946. Prerequisites: 879, 890, 922, 946, 879 for law students.

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. 935.

975 Tax Theory (3) Method and purposes of government taxation; historical development of economic and political theory; comparative analysis of various actual and proposed patterns of taxation; incidence, consumption tax, sin tax, and value-added tax. Required preparation of expository essay on aspect of tax theory chosen by student. Limited enrollment.


980 Insurance (3) Types of insurance: life, property, health, accident and liability insurance; regulation of insurance industry; interpretation of insurance con-
Life Sciences

<table>
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<tr>
<th>MAJOR</th>
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<tr>
<td>Life Sciences (College of Arts and Sciences)</td>
<td>M.S., Ph.D.</td>
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**REQUIREMENTS**

- **Life Sciences 505, 515-16, 520-21, 540-41;**
- **Ecology and Evolutionary Biology 560;**
- **Plant Physiology and Genetics 511, 512;**
- **Plant Sciences and Landscape Systems 471 or 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 8 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/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.
- **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 report and oral proposal. 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; ethnology; plant, physiology, and genetics; and physiology. May be repeated. Maximum 9 hrs.

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**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.

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**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.

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**505 Research Rotation (2)**

Laboratory rotations with faculty member on clearly defined projects. Written report and oral proposal. May be repeated. Maximum 6 hrs.

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**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.

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**510 Special Topics in Life Sciences (1-3)**

Specializations in biotechnology; cellular, molecular, and developmental biology; environmental toxicology; ethnology; 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 and technology concentration. 516—Science and ethics of practice of science. S/NC only.

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 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.

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.

595-96 Special Topics in Genome Science and Technology (1-3) Tutorials or lectures on variety of special topics to be chosen by instructor. May be repeated. Maximum 4 hrs.

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

610 Advanced Topics in Life Sciences (1-3) Topics vary. May be repeated. Maximum 6 hrs.

695-96 Advanced Topics in Genome Science and Technology (1-3) Topics vary. May be repeated. Maximum 4 hrs.

Business Administration

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.

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.

511 Organizational Theory: Integrated Structure and Behavior (3) Cases, 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 supply chain flows and processes. Introduction to management strategies and techniques applicable to design of systems in logistics and operations processes. Prereq: Business Administration 511, 512, and 513 or consent of instructor. (Same as Logistics and Transportation 510.)

541 Operations Management (3) Techniques applicable to design of systems in operations planning and control in manufacturing and service industries. 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.

610 Seminar in Advanced Organization Theory (3) Analysis of functioning of complex organizations. Clas-sical and open systems models, organization growth and change, organizational effectiveness and design of complex organizations.

611 Seminar in Strategic Management I (3) Analysis of concepts and research in strategic management.

612 Seminar in Strategic Management II (3) Analysis of concepts and research in strategic management.

613 Seminar in Strategic Management III (3) Review and analysis of important books and monographs in strategic management. Understanding evolution of thought and emergence of distinct paradigms.

Management Science

See Marketing, Logistics and Transportation

Management

(College of Business Administration)

Major Degrees

Business Administration ........................ MBA, Ph.D.

Oscar Fowler, Head

Professors:

Gilbert, Kenneth C., Ph.D. ............. Tennessee
James, Lawrence R. (Pilot Chair of Excellence), Ph.D. ..................... Utah
Judge, William Q., Ph.D. .................. North Carolina
Ladd, Robert T., Ph.D. ..................... Georgia
Miller, Alex (W. B. Stokely Professor), Ph.D. .................................. Washington
Neel, 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. (The Ball Corporation Distinguished Professor of Business), Ph.D. ............. Northwestern
Stahl, Michael J. (Distinguished Professor of Management), Ph.D. .......... Rensselaer
Woehr, D. J., Ph.D. ....................... Georgia Tech

Associate Professors:

Bowers, Melissa R., Ph.D. ............. Clemson

Edirisinghe, Chanaka P., Ph.D. .......... British Columbia
Elenkov, Detelin S., Ph.D. .............. MIT
Fowler, Oscar S., Ph.D. ................... Georgia
Haley, Usha C. V., Ph.D. ............... New York

Assistant Professor:

Smith, Anne D., Ph.D. ............. North Carolina

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.

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.

511 Organizational Theory: Integrated Structure and Behavior (3) Cases, 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 supply chain flows and processes. Introduction to management strategies and techniques applicable to design of systems in logistics and operations processes. Prereq: Business Administration 511, 512, and 513 or consent of instructor. (Same as Logistics and Transportation 510.)

541 Operations Management (3) Techniques applicable to design of systems in operations planning and control in manufacturing and service industries. 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.

610 Seminar in Advanced Organization Theory (3) Analysis of functioning of complex organizations. Classical and open systems models, organization growth and change, organizational effectiveness and design of complex organizations.

611 Seminar in Strategic Management I (3) Analysis of concepts and research in strategic management.

612 Seminar in Strategic Management II (3) Analysis of concepts and research in strategic management.

613 Seminar in Strategic Management III (3) Review and analysis of important books and monographs in strategic management. Understanding evolution of thought and emergence of distinct paradigms.

Management Science

(College of Business Administration)

MAJORS

Management Science ......................... M.S., Ph.D.

Kenneth C. Gilbert, Chairperson

Committee:

Bowers, Melissa R., Management
Bozdogan, Hamparsum, Statistics
Edirisinghe, Chanaka P., Management
Fowler, Oscar S., Management
Gilbert, Kenneth C., Management
Leitmaker, 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 qualitative 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 Hours
Core Requirements 16
Management Science 531, 532, 533, 534, and 691 or 692
Statistics 563
Applied specialization area (approved by advisor) 9
Technical elective: 6
Statistics (500 level or above as approved by advisor)
Mathematics (400 level or above as approved by advisor)
Industrial Engineering (400 level or above as approved by advisor)
Other elective (as approved by advisor)
Electives selected from mathematics, statistics, computer science, business, management science, industrial engineering, or other approved area 9
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. The program includes approximately 16 to 20 semester hours of coursework in the applied area.

Qualifying Examinations

The student must demonstrate mastery of probability theory and statistical inference, Statistics 563, 564, by passing a written qualifying examination.

Mastery of 12 to 14 semester hours in mathematics coursework must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis, either Mathematics 471, 472, 453, and 571, or 571-572, and real analysis, Mathematics 445-446. Other options may be approved. In exceptional circumstances, the faculty will consider waiving the mathematics and/or statistics qualifying examinations.

These requirements generally are completed by the end of the first year of the program.

There is no foreign language requirement.

Comprehensive Examination

Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written comprehensive examination covering the theory of deterministic and stochastic management science models. Topics included in this examination are determined on an individual basis. Students will be expected to demonstrate an integrative ability that goes beyond simple mastery of course content.

Research and Dissertation

The student must complete 24 semester hours of Management Science 600: Doctoral Research and Dissertation, through which he/she is expected to make a significant contribution to the science. A final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate. This effort, which is beyond the minimum 48 hours of coursework, normally is completed in the third year of the program.

ACADEMIC STANDARDS

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

PREREQUISITES FOR MANAGEMENT SCIENCE COURSES

The Management Science Program is interdisciplinary and students in other degree programs are encouraged to enroll in management science courses. Course prerequisites are designed to indicate the level at which courses are taught. Interested students whose prior coursework does not match the prerequisites are encouraged to seek the instructor’s guidance and consent to enroll.

GRADUATE COURSES

500 Thesis (1-15) P/NP only.
502 Registration for Use of Facilities (1-15) Required for students not 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.
526 Advanced Applications of Systems Modeling and Simulation (3) (Same as Industrial Engineering 526.)
531 Mathematical Programming (3) Linear programming solution procedures, duality, sensitivity, and parametric analysis, linear fractional, piecewise-linear, separable and integer programming, transportation linear programs. Prereq: Fundamentals of matrix algebra. (Same as Industrial Engineering 523.)
532 Stochastic Models in Management Science (3) Discrete-time Markov chains, Poisson processes, continuous-time Markov chains, renewal theory, and queuing theory. Prereq: Statistics 563 and Mathematical Analysis or consent of instructor.
533 Computational Mathematical Programming (3) Computational aspects of mathematical programming models, in particular for large systems. Prereq: 531 and proficiency in computer language.
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 study on subject of mutual interest.

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

621 Network Flows (3) Treatment of network optimization algorithms, transportation and transshipment models and primal-dual and primal-basis tree methods. Prereq: 531 or equivalent.

631 Integer Programming (3) Theoretical and computational aspects of linear programming with integer variables, branch and bound, cutting plane, and group theoretic algorithms. Prereq: 531 or equivalent.

651 Nonlinear Optimization (3) Kuhn-Tucker theory in nonlinear programming, solution procedures for constrained and unconstrained nonlinear programs, search techniques, quadratic programming, duality, and sensitivity analysis. Prereq: 531 or equivalent, proficiency in computer language. (Same as Industrial Engineering 602.)

681 Special Topics (Prereq: 531, 532 and consent of instructor. May be repeated. Maximum 9 hrs.

691-92 Management Science Seminar (1,1) Subjects selected from current literature. S/NC only.

## Marketing, Logistics, and Transportation

(College of Business Administration)

### MAJOR

#### DEGREES

Business Administration .......... MBA, Ph.D.

Robert B. Woodruff, Head

Professors:

- Barnaby, D. J., Ph.D. ................. Purdue
- Cadotte, E. R., Ph.D. ............... Ohio State
- Davis, F. W., Jr., Ph.D. .............. Michigan State
- Dicer, G. N., DBA ..................... Indiana
- Mentzer, J. T. (Harry J. Bruce Chair of Excellence), Ph.D. ..................... Michigan State
- Schumann, D. W. (Taylor Professor), Ph.D. ........................................... Missouri
- Woodruff, R. B. (Liaison) (Proffitt’s Professor), DBA .............................. Indiana

Associate Professors:

- Dahbolkar, P. A., Ph.D. ............. Georgia State
- Foggin, J. H., DBA .................... Indiana
- Gardial, S. F., Ph.D. ................. Houston
- Kahn, K.B., Ph.D. ..................... Virginia Tech
- Holcomb, M. C., Ph.D. .............. Tennessee
- Moon, M. A., Ph.D. .................. North Carolina
- Reizenstein, R. C., Ph.D. ............ Cornell
- Rentz, J. O., Ph.D. ................... Georgia
- Rinehart, L. M., Ph.D. .............. Tennessee

Assistant Professors:

- Flint, D. J., Ph.D. .................... Tennessee
- Myers, M. B., Ph.D. .................. Michigan State
- Ruzicka, M. E., Ph.D. ............... Arizona State

Sahin, Funda, Ph.D. .................... Texas A&M

Instructor:

Collins, Mark E., MBA Middle Tennessee State

### BUSINESS ADMINISTRATION CONCENTRATIONS

For complete listing of MBA and Ph.D. program requirements, see Business Administration.

**MBA Concentration: Logistics and Transportation**

Minimum course requirements for logistics and transportation — Logistics and Transportation 510, 546, and 547. For marketing — Marketing 520 and 530.

**Ph.D. Concentration: Logistics and Transportation**

Minimum course requirements for logistics and transportation — 611, 612, 613, 614, and 615. For marketing — 611, 612, 613, 614, 615, and 616.

### Logistics and Transportation

#### 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 Logistics and Operations Management (3) (Same as Management 540.)

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 a global environment. Prereq: 510 and Business Administration 511, 512, 513, and 514.

593 Independent Study (3-6) Directed research and study. Prereq: Consent of instructor. May be repeated.

599 Special Topics Seminar (3 Topics vary: market forecasting, market segmentation, services marketing, marketing channels, and related issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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

611 Theoretical Foundations (3) Theoretical foundations and frameworks common to business research. Historical and philosophy of science perspectives. (Same as Logistics and Transportation 611.)

612 Research Methods I (3) Research process: philosophical foundations, problem formulation, grounded theory, qualitative methods and analysis, measurement, sources of error, experimental design and analysis, and survey design and analysis. (Same as Logistics and Transportation 612.)

613 Supply Chain Management Thought (3) Survey of concepts and research methods of interorganizational systems. Supply chains will be studied from multiple perspectives including the following: institutional design and structure, transaction cost economics, operations and logistics cost economics, exchange behaviors and strategies, supply chain partnerships, and evaluation of supply chain performance.

614 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 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 planning in organizations. Twin problems of analyzing markets and customer behavior and translating these analyses into actionable marketing strategies. Prereq: Business Administration 511, 512, and 513 or consent of instructor.

530 MBA Marketing Concentration (6) Product management, pricing, inter-disciplinary 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.

593 Independent Study (3) Directed research and study. Prereq: MBA Core and consent of instructor. May be repeated. Maximum 6 hrs.

599 Special Topics Seminar (3 Topics vary: market forecasting, market segmentation, services marketing, marketing channels, and related issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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

611 Theoretical Foundations (3) Theoretical foundations and frameworks common to business research. Historical and philosophy of science perspectives. (Same as Logistics and Transportation 611.)

612 Research Methods I (3) Research process: philosophical foundations, problem formulation, grounded theory, qualitative methods and analysis, measurement, sources of error, experimental design and analysis, and survey design and analysis. (Same as Logistics and Transportation 612.)

613 Research Methods II (3) Examination of qualitative research theoretical foundations and methodologies. Application of qualitative research methods to marketing research. Topics include formulating research questions, designing qualitative research studies, sampling, data generation techniques, data analysis techniques, evaluating qualitative research, and writing qualitative research reports.

614 Contemporary Marketing Thought (3) Representative topics comprising content of marketing knowledge: macro-marketing, markets, channels, and competitive behavior; marketing mix tools; and ethical issues in marketing. Examination of research for contributions to advancing knowledge and opportunities for new research.
Materials Science and Engineering

(College of Engineering)

MAJORS  DEGREES

Materials Science and Engineering .......... M.S., Ph.D.
Polymer Engineering ......................... M.S., Ph.D.

Raymond A. Buchanan, Interim Head

Professors:
Bhat, Gajanan S., Ph.D. ............ Georgia Tech
Benson, Roberto S., Ph.D. ............ Florida State
Bresee, Randall R., Ph.D. ............ Florida State
Buchanan, Raymond A. (Liaison),
PE, Ph.D. ........................................... Vanderbilt
Collier, Billie J., Ph.D. ..................... Tennessee
Dahotre, Narendra B. (UT/ORNL Joint
Faculty), Ph.D. ................ Michigan State
Egami, Takeshi (UT/ORNL Distinguished
Scientist), Ph.D. ................ Pennsylvania
George, Easo (UT/ORNL Joint Faculty),
Ph.D. ........................................ Pennsylvangia
Hansen, Marion G., Ph.D. ............ Wisconsin
Liaw, Peter K. (Rachell Chair of Excellence),
Ph.D. ........................................ Northwestern
Lowndes, Douglas H., Ph.D. ........ Colorado
Lundin, Carl D., Ph.D. ................ Rensselaer
McHargue, Carl J. (Director, Center for
Materials Processing), Ph.D. ........ Kentucky
Pedraza, Anthony J.,
Ph.D. ........................................ La Plata (Argentina)
Pharr, George M. (UT/ORNL Joint Faculty),
PE, Ph.D. ................................ Stanford
Phillips, Paul J., Ph.D. ............... Liverpool (UK)
Simpson, Michael L. (UT/ORNL Joint
Faculty), Ph.D. ......................... Tennessee
Spreull, Joseph E., Ph.D. ............ Tennessee
Wadsworth, Larry C.,
Ph.D. ........................................ North Carolina State

Associate Professor:
Meek, Thomas T., Ph.D. ............... Ohio State

Assistant Professors:
Choo, Hahn (UT/ORNL Joint Faculty),
Ph.D. ........................................ Illinois IT
Hu, Bin, Ph.D. .......... Chinese Academy of Sciences
Kit, Kevin, Ph.D. ....................... Delaware
Rack, Philip D., Ph.D. ............... Florida
Rawn, Claudia J. (UT/ORNL Joint Faculty),
Ph.D. ........................................ Arizona

Emeriti Faculty:
Brooks, Charlie R., Ph.D. .......... Tennessee
Fellers, J. F., Ph.D. ............... Akron
Oliver, Ben F., Ph.D. ............ Penn State

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 metallurgy; materials processing; welding metallurgy and materials joining; corrosion science and engineering; biomaterials; and mechanical and physical behaviors of materials.

Areas of concentration within the Polymer Engineering degree program include rheology and polymer processing; polymer morphology; mechanical, physical and chemical behavior of polymers; and composite materials.

THE MASTER’S PROGRAM

Thesis Option
A total of 30 semester hours is required for the M.S. degree in either 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 concentration; 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.
2. Additional courses up to 12 hours total in related areas.
4. Satisfactory performance on a comprehensive oral examination administered by the faculty committee.

Non-Thesis Option
Any candidate may apply for a non-thesis option. Upon acceptance, a supervisory committee of three will be appointed. At least two members of the committee will be from the faculty in the major area, either materials science and engineering or polymer engineering. The requirements for completion of the non-thesis option are as follows:
1. Completion of a total of 30 hours of graduate coursework. At least 18 of those hours must be in the department, and up to 12 hours may be in related areas. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. The materials science and engineering major and the polymer engineering major must include the same courses required for the thesis option. The candidate’s degree program must be approved by the faculty committee.
2. Satisfactory completion of a culminating experience such as MSE 580 (Critical Review).
3. Satisfactory performance on a comprehensive examination administered by the faculty committee.

THE DOCTORAL PROGRAM

After one year in residence and with the approval of the faculty, a student may proceed directly to the doctoral program without completion of a master’s degree. Departmental requirements for completion of the doctoral degree are:
1. a. For students proceeding directly to the Ph.D. from the baccalaureate degree: 48 graduate course credit hours with at least six hours of 600-level courses. Six hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 30 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, metallurgical or polymer engineering operations and processes, thermodynamics, technology, mathematics, physics, chemistry, and other related fields.
   4. Active participation in graduate seminars conducted by the department. Resident students must register for the appropriate 503 or 504 every semester offered.

GRADUATE COURSES

465 Structural Characterization of Materials (4) X-ray diffraction and fluorescence; scanning and transmission electron microscopy; microanalytical techniques.
421 Mechanical Behavior of Materials II (3) Description of stress and strain; linear elastic constitutive equations, isotropic and anisotropic moduli in various materials; yield criteria; brittle fracture; crazing; plastic strain concepts and work-hardening; forming operations and limit criteria. Prereq: Mechanical Behavior of Materials, Mechanics of Materials I, sophomore mathematics.

429 Introduction to Ceramic Matrix Composites (3) Characteristics of composites: ceramic matrix composites; matrix mechanics and materials design; overview of fabrication techniques; microstructural characterization; physical and mechanical property evaluation; current and potential applications. Prereq: Intro- duction to Materials Science and Engineering. 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; plastic classification; design and selection criteria; processing techniques; characterization laboratory.


472 Fundamental Principles of Composite Materials (3) Establishment of physical principles basic to design, manufacture and application of fiber reinforced metals, polymers and ceramics. Prereq: 302 or equivalent.

474 Biomaterials (3) Metals, polymers and ceramics used in orthopaedic, cardiovascular, and dental surgical implant devices; corrosion and degradation problems; material properties of primary importance; tissue response to synthetic materials. Prereq: 201. Recommended for engineering science and mechanics majors.

484 Introduction to Maintenance Engineering (3) (Same as Nuclear Engineering 484, Chemical Engineering 484, Industrial Engineering 484, and Mechanical Engineering 484.)

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

502 Registration for Use of Facilities (1-15) P/NP only.

512 Fundamentals of Materials Science and Engineering I (3) Chemical bonding, structures, defects, short-range order, phase diagrams, microstructures, and phase transformations.

514 Fundamentals of Materials Science and Engineering II (3) Physical properties: electrical and thermal conduction, elementary quantum physics, band theory, dielectric materials, magnetic and optical properties. Mechanical behavior: stress and strain at a point, elastic constitutive equations, phenomenologi- cal bulk behavior, and deformation mechanisms.


522 Defects in Crystals (3) Analytical and experi- mental analysis of defect interactions in solids. Prereq: 421 or consent of instructor.

523 Plastic Deformation of Metals (3) Geometry and mechanisms of single crystal 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; tex- ture formation. Prereq: 301, 320 or consent of instructor.

524 Metallurgical Thermodynamics (3) Applications of chemical thermodynamics to metallurgical prob- lems: refining, oxidation, surface treatments, alloy systems. Prereq: 570 or equivalent.

525-26 Welding Metallurgy (3,3) Welding processes; solidification, microstructural characterization; heat flow; residual stresses; theories of hot cracking, cold cracking and porosity formation; application to process and product evaluation. Prereq: 524.

526 Ceramic Matrix Composites: Material and Mechan- ics (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, reac- tions of synthetic polymers. Molecular char- acterization: solution methods and spectroscopy. Prereq: Semester of organic chemistry and thermo- dynamics or equivalent.

541 Polymer Rheology (3) Deformation and flow of polymeric materials. Development of empirical models, linear viscoelasticity and finite strain constitutive equations; material functions, temperature depen- dence and rheometry with applications to synthesis and processing. Elementary kinetic theory of elastic dumbbell suspensions. Prereq: Chemical Engineer- ing 240 Fluid Flow and Heat Transfer or equivalent. (Same as Chemical Engineering 240.)

542 Further Topics in Polymer Processing (3) De- scription and analysis of selected polymer processing operations. Prereq: 541.


544 Polymer Solution Thermodynamics and Charac- terization (3) Theories of solutions, statistical thermodynamics. Characterization, treatment of chro- matographic, viscometric, and osmotic and osmotic pressure. Prereq: Undergraduate physical chemistry.

546 Mechanical Properties of Solid Polymers (3) Types of mechanical behavior; Hookean and rubber elasticity; plastic deformation; fracture; linear vis- coelasticity; dynamic mechanical behavior and test- ing; loss tangent; experimental methods. Introduction to mechanical properties of polymeric composites.

549-50 Laboratory Methods in Polymer Engineering (1,2) Basic experimental techniques and instrumenta- tion associated with characterization, x-ray and light microscopy, rheometry, mechanical prop- erties of solid polymers, polymer processing opera- tions. Coreq: 540 or consent of instructor. 549-S/NC only.

552 Fiber Science (3) Physical properties, mechan- ical properties and microstructure of polymeric fibers, relation to end-use properties. Prereq: Organic Chem- istry and Thermal Physics or equivalent.

553 Nonwovens Science and Technology I (3) Non- woven fabric technology; different web forming pro- cesses and relationships between the chemical, mor- phological and mechanical properties of fibers and orientation in webs to final performance properties of bonded structures. Prereq: Organic chemistry or consent of instructor.

554 Nonwovens Science and Technology II (3) Interrelations between mechanics of production and mechanical properties of nonwoven fabrics; charac- terization of fiber morphology and web structure; chemistry of nonwoven binders and finishes; and engineering of specific fabric properties. Prereq: 553 or equivalent.

555 Laboratory Methods in Nonwovens Processing and Characterization (3) Laboratory experience in nonwovens fabrication processes and character- ization techniques. Effect of processing conditions on structure development and properties of different types of webs. Prereq: 552 and 553.

560 Principles of Ceramic Processing (3) Treat- ment of ceramic processing; raw materials prepara- tion and characterization; powder consolidation; dry- ing, firing, sintering techniques, mechanisms and ki- netics. Prereq: 360 or equivalent.

570 Optical Microscopy (4) Basic compound and polarizing microscopy for imaging. Optical property measurements, and structure elucidation. Other meth- ods of optical microscopy. Prereq: Fundamentals of Physics: Wave Motion, Optics and Modern Physics or equivalent. 3 hrs and 2 labs.

572 X-Ray Diffraction (3) Symmetry of crystals, space group theory, reciprocal lattice and application to defi- nition of structures; powder and single crystal x-ray techniques; introduction to crystal structure determin- ation; characterization of orientation; application to inorganic, metallic and polymer structures.


576 Special Topics in Materials Science and Engi- neering (3) Topics of current significance and inter- est. Prereq: Consent of instructor. May be repeated.


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

621-22 Theoretical Metalurgy (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, magneto-hydrodynamics of incompressible fluids, growth- stability theory, thermal applications, rapid solidification theory, metastability. Prereq: Consent of instructor.

625 Materials Lifetime Science and Engineering I (1) Fundamentals of aqueous and nonaqueous 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.

630 Thin Film Materials Processing (3) Students learn materials issues and thin film processing techniques used to manufacture semiconductor devices. Topics include basic vacuum technology, plasma physics, sputtering, evaporation (resistive, electron beam, laser ablation), chemical vapor deposition, and etching. The fundamentals of each process are explored and relevant material and chemical reactions are discussed. Thin film growth models are also explained and processing variables are related to material properties. Prereq: Permission of instructor.


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 642.)

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.

644 Optoelectronic Processes in Polymeric Materials (3) This course introduces fundamental molecular orbitals and wave functions of bands and discusses optical and electronic properties of polymeric materials. Application to devices and devices, and 3) methods of applications of optical spectroscopy in characterization of crystalline phases. The focus is to understand electron related processes and opto-electronic characterizations of polymeric materials and devices. The fundamentals of optical spectroscopy are also explained in determining structure-property relationships in polymer research. Prereq: 543 or equivalent, and permission of instructor.

672 Introduction to Transmission EM and Electron Diffraction (3) Fundamentals of electron scattering, reciprocal space, the Ewald Sphere construction. Basic electron optics, operation of the transmission electron microscope (includes some laboratory sessions) and sample preparation. The kinematical theory of imaging of perfect and imperfect crystals in the TEM. Problems with the kinematic theory. Introduction to the dynamical theory of TEM imaging. The effect of inelastic scattering in the TEM. Fundamentals of analytical electron microscopy. The Transmission Scanning Electron Microscope (STEM) and its relation to the TEM. Prereq: Either 405, 511, or 572; and permission of instructor.

673 Introduction to Scanned Probe Microscopies (3) A survey of techniques for surface imaging and characterization. Young’s Topografiner, field emission, and the beginning of scanning tunneling microscopy (STM) and atomic force microscopy (AFM) (includes operation of the (STM) laboratory sessions). Image formation and interpretation in the STM, analytical STM imaging. The theory and control of feedback loops in SPM. The generalization of Scanning Probe Microscope (SPM) and the Atomic Force Microscope (AFM). Theory of operation of AFM, limits to resolution, and image interpretation (includes laboratory session). Important variants of the SPM including scanning capacitance, scanning near field optical, and scanning thermal microscopes. The theory of nanoscale structures. Prereq: Permission of the instructor.

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
Conway, J. B., Ph.D. ................. Louisiana State
Daverman, Robert J., Ph.D. ........ Wisconsin
Dobbs, D. E., Ph.D. ............... Cornell
Dyadk, J., Ph.D. ...................... Warsaw
Gavrilits, Sergey, Ph.D. .......... Moscow State
Gross, L. J., Ph.D. ................. Cornell
Hinton, D. B., Ph.D. ............... Tennessee
Jordan, G. Samuel, Ph.D. ........ Wisconsin
Karakashian, O., Ph.D. .......... Harvard
Kupershmidt, B. A. (UTSI), Ph.D. .... Mit
Lenhart, S., Ph.D. ................. Kentucky
Muly, 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
Schafer, P. W., Ph.D. .............. Maryland
Simon, H., Ph.D. ................. Cal Tech
Son, R. P., Ph.D. ................ Oregon State
Stephenson, K. R., Ph.D. .......... Wisconsin
Sundberg, C., Ph.D. .............. Wisconsin
Thistlethwaite, 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
Guan, Bo, Ph.D. ............... Massachusetts
Kimble, K. R. (UTSI), Ph.D. ...... Ohio State
Kub, Y., Ph.D. .................... Cincinnati
Schulze, Timothy, Ph.D. .... Northwestern
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
Gleason, Jim A., Ph.D. ............ California
Kachi, Yasuyuki, Ph.D. .......... Tokyo
Matthews, Gretchen, Ph.D. ......... Louisiana State
Todorov, Grozdena, Ph.D. ......... Moscow State
Tzermias, Pavlos, Ph.D. .......... Florida State
Ermer, K., Ph.D. ...................... Cornell
Sonu, R. P., Ph.D. ............... Oregon State
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. Of 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 constraints 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.

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.

3. Pass an examination in the field of specialization. After the requirements in 1. and 2. have been met, this examination will be given by a committee appointed by the department head. A student may take this examination only twice.

4. Pass a one-year, 400-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 selected for written examinations must be from Groups I, II, III. At least two groups must be represented in the three written examinations. At least three groups must be represented in the five subjects.


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 examinations in both Ordinary Differential Equations and Partial Differential Equations, but both may be included in a student’s five subjects. With prior approval of the graduate committee, a student may utilize 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 requirements.

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 and at least one must be passed before the start of a 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 is permitted for each of up to two subjects, and this use of a written examination must be declared before the examination is taken so that the sitting for the examination and any failure are not counted toward the limits in condition c.

**Mathematical Ecology Concentration**

The student must pass written examinations in three subjects:

2. A subject from Groups I, II, and III of the standard program.
3. A subject represented by a year-long graduate-level sequence from outside the Department of Mathematics. The sequence must be approved in advance by the mathematical ecology faculty and by the departmental Graduate Committee. At least one member of the mathematical ecology faculty must be involved in the grading of the examination. The examination in this subject may be taken only twice.

The student also must earn grades of B+ or better each semester in the courses associated with two additional subjects 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 d. placed on the taking of written examinations, 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 from ancient 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 non-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.

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 equations, 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 designs. 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: Probability and Statistics or consent of instructor.

425 Statistics (3) Derivation of standard statistical distributions: t, F and X2; independence of sample statistics. (3)

426 Prerequisites: 423. Derivation of standard statistical processes. Other topics as selected by instructor. Prereq: 425 Differential Equations, and numerical solution of initial and boundary value problems of ordinary differential equations, stiff systems. Prereq: Numerical Algorithms I or consent of instructor. (Same as Computer Science 472.)


471 Topology (3) Topology of line and plane, separation properties, compactness, connectedness, 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 splines. Numerical integration and numerical solution of initial and boundary value problems of ordinary differential equations, stiff systems. Prereq: Numerical Algorithms I or consent of instructor. (Same as Computer Science 472.)


475 Industrial Mathematics (3) Modeling, analysis, and computation applied to scientific/technical/industrial problems. Prereq: Differential Equations I and either Computer Literacy for Mathematics or Numerical Algorithms, or consent of instructor.

490 Readings in Mathematics (1-3) Open to superior students with consent of instructor and independent study with faculty guidance. Prereq: Consent of faculty mentor to supervise independent work. May be repeated. Maximum 9 hrs.

499 Seminar in Mathematics (1-3) Topics vary. Requires formal class presentations by students. Credit hours announced for each seminar. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when she/he is using a University facility, and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. Prereq: Consent of instructor.

503 Discrete Mathematics for Teachers (3) Mathematical logic and methods of argument, sets, functions, relations, combinatorics. Normally first graduate course for students seeking M.M. degree. Prereq: 411-12, or 511-12. May be repeated. Prereq: 1 yr calculus or equivalent.

504 Discrete Mathematics for Teachers (3) Mathematical logic and methods of argument, sets, functions, relations, combinatorics. Normally first graduate course for students seeking M.M. degree. Prereq: 411-12, or 511-12. May be repeated. Prereq: 1 yr calculus or equivalent.

505 Analysis for Teachers (3) Development of differentiation, integration, proofs of basic theorems. Prereq: 504 or 511. May not apply toward M.S. degree in mathematics. Prereq: 1 yr calculus or equivalent.

506 Algebra for Teachers (3) Algebraic structures: integral domains and fields and their applications to algebra of integers and polynomials. Prereq: 505 or 511. May not apply toward M.S. degree in mathematics. Prereq: 1 yr calculus or equivalent.

509 Seminar for Teachers (3) For students in Master of Mathematics program and for students in graduate programs in College of Education. Prereq: 513-14, or consent of instructor.


514-15 Topology (3) Topology of linear and plane, separation properties, compactness, connectedness, continuous functions, homeomorphisms, and topological invariants. Prereq: Calculus III and Introduction to Abstract Mathematics, or consent of instructor.

517-18 Mathematical Methods in Physics (3,3) (Same as Physics 571-72.)

519 Seminar in Applied Mathematics (1-3) May be repeated. Maximum 12 hrs.

521-22 Enumerative Combinatorics (3,3) Sieve methods, Polya enumeration theorem, and permutation groups applied to enumeration of discrete structures. Incidence algebras and combinatorics of partially ordered sets.


525-26 Statistics (3,3) Pertinent facts from probability theory, formulation of statistical models; sufficiency, Fisher-Neyman factorization theorem, exponential families, Bayesian models; methods of estimation and optimality theory; uniform minimum variance unbiased estimates, asymptotic efficiency and optimality; the confidence procedures and hypothesis testing; optimal tests and confidence intervals, the Neyman-Pearson lemma and uniformly most powerful tests; general linear models, estimation and tests in linear models; non-parametric models, rank methods for comparison, linear models and independence; goodness-of-fit and robust tests; topics from decision theory. Prereq: 445-46. Recommended prereq: 423.

527 Stochastic Modeling (3) Models in probability applied to real world situations; queuing theory; branching processes; Monte Carlo simulation. Prereq: 445-46 or consent of instructor.


534 Calculus of Variations (3) Necessary conditions for extrema, Euler’s equation, broken extremals, Weierstrass condition, conjugate conditions for the extremum-Legendre’s and Jacobi’s conditions, conjugate points. Multiple integrals. Prereq: 431.

535-36 Partial Differential Equations (3,3) First order equations, classification of equations and properties of solutions of elliptic, hyperbolic, and parabolic equations in several variables. Prereq: 445-46 and 231 or consent of instructor.

537-38 Mathematical Principles of Continuum Mechanics (3,3) Conservation principles, equations of equilibrium and motion for fluids and elastic solids, constitutive relations and stress, convexity properties, bifurcation phenomena, existence theory. Prereq: 431, 435, 448 or 448, or consent of instructor.
539 Seminar in Differential Equations (1-3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.


549 Seminar in Analysis (1-3) May be repeated. Maximum 12 hrs.

551-52 Modern Algebra (3,3) Groups, rings, modules and linear algebra, fields and Galois theory. Must be taken in sequence. Prereq: 455-56 or consent of instructor.

553 Linear Programming (3) Theory and applications. Prereq: Consent of instructor or 453 and programming ability.


555-56 Number Theory (3,3) Introduction to algebraic number theory. Prereq: 445-56 or consent of instructor.

559 Seminar in Algebra (1-3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.


567-68 Differential Geometry (3,3) Classical differential geometry in two and higher dimensions: curves and surfaces in Euclidean space. Gauss map, curvature, Gauss-Bonnet theorem, hyperbolic geometry, Manifolds and Riemannian metrics; connections, geometry and probability in Banach spaces, probabilistic processes: Ito's calculus and stochastic differential equations. Prereq: 431 or 453 or consent of instructor.

569 Seminar in Topology (1-3) May be repeated. Maximum 12 hrs.


575 Matrix Theory and Techniques in Numerical Analysis (3) Study of iterative and direct methods for large systems of linear equations: sparse matrix analysis, relationship to modern computer architectures. Prereq: 435, 471-72, or consent of instructor. May be repeated. Maximum 9 hrs. (Same as Computer Science 575.)

577 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.

578 Numerical Methods for Partial Differential Equations (3) Numerical approximation of solutions of partial differential equations including conservation laws and hyperbolic, parabolic, and elliptic problems. Derivation, physical meaning, and implementation of schemes. Prereq: 435 or 512 or 515, Fortran or C, or consent of instructor.

579 Seminar in Numerical Mathematics (1-3) May be repeated. Maximum 12 hrs.

581-82 Mathematical Ecology (3,3) Deterministic and stochastic models of populations, communities, and ecosystems. Prereq: 431, 453 or consent of instructor. (Same as Ecology and Evolutionary Biology 581-582.)

583 Mathematical Evolutionary Theory (3) Population genetics and evolutionary ecology. Prereq: 431, 453 or consent of instructor. (Same as Ecology and Evolutionary Biology 583.)

585 Optimal Control Theory (3) Deterministic optimal control. Examples involving calculus of variations, optimal trajectories, and engineering control problems. Introduction to stochastic control. Prereq: 431, 445-46 or consent of instructor.

589 Seminar in Mathematical Ecology (1-3) May be repeated. Maximum 12 hrs.

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

598 Graduate Reading in Mathematics (1-3) Independent study with faculty guidance. Prereq: Graduate standing and consent of instructor. May be repeated. Maximum 6 hrs.

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


619 Seminar in Applied Mathematics (1-3) May be repeated. Maximum 12 hrs.

623-24 Advanced Probability (3,3) Selected topics in modern theory of probability and stochastic processes: Itô's calculus and stochastic differential equations, integration prediction theory, ergodic theory, probability on algebraic structures, limit theorems, geometry and probability in Banach spaces, probability methods in analysis. Prereq: 523-24 or consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

629 Seminar in Combinatorics (1-3) May be repeated with consent of department. Maximum 12 hrs.

631-32 Advanced Ordinary Differential Equations (3,3) Theory of ordinary differential equations from advanced viewpoint. Topics from current literature. Subject matter varies according to interests and prepa-
rations of students. Prereq: 531-32 or consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

635-36 Advanced Partial Differential Equations (3,3) Selected topics in classical and modern theoretical partial differential equations. Prereq: 541-42 or 547-48 or consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

641-42 Functional Analysis (3,3) Topological vector spaces, distributions, and Banach algebras with applications to Fourier analysis and differential equations: theorems of Krein-Milman, Paley-Wiener, Lax, Ma-

579 Seminar in Numerical Mathematics (1-3) May be repeated with consent of department. Maximum 12 hrs.

561-52 Advanced Modern Algebra (3,3) Selected topics in modern algebra or number theory. Prereq: 551-52 or consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

569 Seminar in Algebra (1-3) Prereq: Consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

563-64 Algebraic Topology (3,3) Homology, coho-
mology and homotopy theories; duality theorems and Hurewicz isomorphism theorem. Prereq: 561-52 and 1 yr of abstract algebra, 455-56 or 551-52. May be repeated with consent of department. Maximum 12 hrs.

567-68 Advanced Differential Geometry (3,3) Se-
lected 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.

569 Seminar in Topology (3) May be repeated with consent of department. Maximum 12 hrs.

573 Advanced Topics in Numerical Partial Di-

579 Seminar in Numerical Mathematics (1-3) May be repeated with consent of department. Maximum 12 hrs.


663-64 Algebraic Topology (3,3) Homology, coho-
mology and homotopy theories; duality theorems and Hurewicz isomorphism 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 Seminar in Numerical Mathematics (1-3) May be repeated with consent of department. Maximum 12 hrs.

681-82 Advanced Mathematical Ecology (3,3) Se-
lected topics in theoretical and applied mathematical ecology: population, community, ecosystem ecology and applied topics such as demography, ecotoxicology, epidemiology, environmental and resource management. Prereq: 581-82. May be repeated. (Same as Ecology and Evolutionary Biology 681-682.)
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 bio-mechanics.

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 in their engineering backgrounds. The general GRE is required of all international applicants for admission.

In Engineering Science, entrance into the graduate program is available to graduates of recognized curricula in engineering, mathematics, or one of the physical or biological sciences. A program application is required in addition to the Graduate Application for Admission. The names and addresses of four references must be included with the program application. The general GRE are 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 programs committee. The thesis option, Option I, requires submission of a dissertation and defense of a written thesis that satisfies all the requirements of the Graduate programs committee. Four independent investigations are available with majors in Mechanical Engineering or Aerospace Engineering (concentration in product development and manufacturing).
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 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 – Major in Mechanical Engineering

<table>
<thead>
<tr>
<th>Period</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 508</td>
<td>Integrated Product, Process, and Manufacturing System Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td>BA 514</td>
<td>Integrated Business Simulation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ME 509</td>
<td>Project Management</td>
<td>1</td>
</tr>
<tr>
<td>Fall – Second Year</td>
<td>IE 511</td>
<td>Business Planning and Commercialization</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ME 509</td>
<td>Multidisciplinary Project</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ME 551</td>
<td>Mechanical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ME 537</td>
<td>Mechanical Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ME 527</td>
<td>Thermal Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Spring</td>
<td>ME 505</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ME 509</td>
<td>Multidisciplinary Project</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ME 510</td>
<td>Prototype Development and Evaluation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>—</td>
<td>Math/Engineering Elective (select with advisor)</td>
<td>3</td>
</tr>
<tr>
<td>Summer (first session)</td>
<td>ME 594</td>
<td>Culminating Integrated Project Report</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>66</td>
</tr>
</tbody>
</table>

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 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 course(s) that are more appropriate.

In Engineering Science, the courses must include:

1. A minimum of 24 semester hours in engineering graduate courses, exclusive of thesis and dissertation credit. These courses will normally be numbered 500 and above, with at least 9 semester hours of 600-level courses, which constitute one or two areas of concentration selected by the student. The number of courses in this group to be taken will depend on the program selected by the student and the approval of his/her advisory committee.
2. A minimum of 12 semester hours in mathematics or computer science in courses numbered 400 and above, exclusive of a first course in ordinary differential equations.

Additional requirements for all students include:

1. Registration and participation in the graduate seminar in the major program.
2. Meet all departmental examination requirements, which include passing a written and oral comprehensive examination.
3. Presentation of a dissertation proposal to the student’s advisory committee and approval of that proposal by that committee.
CERTIFICATE IN COMPUTATIONAL FLUID DYNAMICS

The College of Engineering offers a certificate program in computational fluid dynamics (CFD). The program is designed primarily for the part-time student interested in gaining dexterity in this subject by taking a course sequence through distance education. All course work is permanently archived at the COE Computational Fluid Dynamics Laboratory web site, hence available on demand on a totally flexible schedule.

The 12-hour certificate is earned by completing the three courses, ES 551, ES 552 and ES 581 (CFD Laboratory), which are extensively cross-listed among departments in the College of Engineering. The certificate is completed with one elective 3 hour course from an approved list. Those currently approved are CHE 507 and ECE 599 (Computer Fire Modeling). A wider selection of courses will be added when they become available.

The sole academic prerequisite for the certificate program is a bachelor’s degree in engineering. Applicants must meet the minimum admission requirements of the UT Graduate School and become admitted thereto.

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 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 CREDIT FOR UNDERGRADUATE COURSES

Students majoring in Mechanical Engineering or Aerospace Engineering may not normally take 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 engineering may be used for graduate credit at the discretion of the advising committee. However, at least two-thirds of minimum required credit hours in a major’s degree program must be at or above the 500-level. With the approval of the student’s major department, a student whose major is outside the Department of Mechanical, Aerospace, and Biomedical Engineering may take senior (400-level) courses in the department for graduate credit. Such students should consult with their student’s major department for graduate credit. Applicants must meet the prerequisites for undergraduate courses.

Aerospace Engineering

NOTE: Not all the courses listed below are available at both the UT and the UTSA campuses.

GRADUATE COURSES


425 Propulsion (3) Principles of propulsion devices; turbo-jet, ram jet and rocket engines. Prereq. 351.


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.


494-95 Selected Topics in Aerospace Engineering (1-1,4,4) Problems and topics related to development and practice in aerospace engineering. Prereq: Consent of instructor.

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

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

511 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 for potential flow and viscous flow; boundary conditions 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 aerodynamics principles to air vehicles to provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speeds. Relations among thrust, drag, lift and attitude. Propulsion systems, stability, performance characteristics, and trajectory optimization. Prereq. 422; 515 for 516.

521-22 Aerodynamics of Compressible Fluids (3,3) One-dimensional internal and external flow; waves; small perturbation theory; shock wave interactions; 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 models and similarity considerations; aerodynamic test facilities: continuous and intermittent wind tunnels and ballistic ranges; propulsion test facilities; air breathing and rocket engines; space environment and space vehicle test facilities. Prereq. 521, 541 and Mechanical Engineering 522.

529 Rarefied Gasdynamics (3) Binary elastic collision; kinetic theory; flow regimes; Boltzmann and model equations, transfer equation, gas-surface interactions; slip boundary conditions, 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 Mathematics 471.

532 Introduction to Turbulence (3) Macroscopic effects, analogies, statistical treatment, correlation 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 during 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 Engineer- ing Science 539 and Mechanical Engineering 539.

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; transonic shockwave phenomena; solution techniques. Prereq. 522.


556 Vertical or Short Take Off and Landing Aircraft (3) Performance, stability, control of rotary wing, tilt wing, vectored lift and vertical riser type aircraft. Vertical and transition flight modes. High lift airfoils. Automatic controls. Simulation facility type and flight testing. Prereq. 555.

GRADUATE COURSES


528 Ceramic Matrix Composites: Material and Mechanics (3) Micromechanics and microstructural design of composites and composites for special applications; interface characterization and mechanics; electron microscopy examination; nondestructive evaluation; fracture; fatigue; applications. Prereq: Consent of instructor. (Same as Materials Science and Engineering 528.)

533 Dynamics (3) (Same as Mechanical Engineering 533 and Aerospace Engineering 533.)

534 Mechanical Vibrations (3) (Same as Mechanical Engineering 534 and Aerospace Engineering 534.)

539 Continuum Mechanics (3) Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy; solutions in solid mechanics. Prereq: Consent of instructor. (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.)

550 Advanced Engineering Applications (3) Computational procedures for differential equation statements in engineering and sciences. Approximation, boundary conditions, error extremization/estimation, element implementation; comparison to legacy finite difference methods. Applications in 1, 2, and 3 dimensions, non-linearity, unsteady problems, coupled equation systems. Examples from diverse technical fields; fluid mechanics, heat/mass transfer, elasticity, electromagnetics, reacting systems. Computer projects. Prereq: Bachelor’s degree in engineering or natural science. (Same as Aerospace Engineering 551 and Mechanical Engineering 551.)

551 Finite Elements for Engineering Applications (3) Computational procedures for differential equations. Applications in engineering and sciences. Approximation, boundary conditions, error extremization/estimation, element implementation; comparison to legacy finite difference methods. Applications in 1, 2, and 3 dimensions, non-linearity, unsteady problems, coupled equation systems. Examples from diverse technical fields; fluid mechanics, heat/mass transfer, elasticity, electromagnetics, reacting systems. Computer projects. Prereq: Bachelor’s degree in engineering or natural science. (Same as Aerospace Engineering 551 and Mechanical Engineering 551.)


553 Computational Solid Mechanics (3) Finite element techniques in structural mechanics and linear elasticity. Two and three-dimensional formulations; isoparametric elements, numerical quadrature. Equations of equilibrium, matrix iteration techniques. Applications in beams, plates and shells; use of representative computer programs in PC and networked Unix-CAD-software. Prereq: 551. (Same as Aerospace Engineering 553 and Mechanical Engineering 553.)


556 Optical Engineering I (4) Wave optics: scalar diffraction theory; introduction to Fourier optics; ray or geometric optics; lenses, mirror, gratings; paraxial design methods; introduction to aberrations.

563 Advanced Topics in Biomedical Engineering (3) Enroll-
568 Optical Engineering II (4) Statistical optics; spontaneous and induced emission: black and gray body radiation; incoherent, partial and totally coherent radiation; spectral 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; bioviscoelasticity of fluids and solids, mechanical properties of blood vessels; skeletal, heart and smooth muscle, cartilage. Research paper. (Same as Biomedical Engineering 571.)

572 Biomedical Fluid Mechanics (3) Application of fluid mechanics theory to fluid flows in living systems. Solutions to differential equations of motion for blood flow in arteries, veins and the microcirculation. Measurement of flow properties of blood and other biological fluids. Analysis of pathological flows, blood flow through arterial stenoses. Study of flow through artificial heart valves and in extracorporeal devices. Study of fluid 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.)


585 Industrial Pollution Prevention (3) (Same as Chemical Engineering 581 and Environmental Engineering 581.)

590 Selected Engineering Problems (2-6) Enrollment limited to junior and senior students. 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 UTSM. May be repeated. S/NC only.

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


645 Theory of Turbulence (3) Mathematical descriptions of turbulence; isotropic turbulence, energy spectra, Kolmogoroff’s hypothesis, large and small eddy structure for turbulent flows; turbulent diffusion by continuous movement; applications to turbulent jets, wakes, pipe flow, and boundary layers. Prereq: 542. (Same as Aerospace Engineering 445.)

651-52 Advanced Topics in Computational Fluid Dynamics (3,3) Modern approximation theory for nonlinear Navier-Stokes systems. Algorithm constructions: finite element, finite volume; accuracy, convergence, stability; smooth and non-smooth solutions; shocks, artificial dissipation mechanisms. Two- and three-dimensional, compressible viscous and inviscid flows; potential and complete Navier-Stokes equations. Descriptions: turbulence closure models, reacting flows; mixed subsonic-supersonic; Computer programs, production software. Prereq: 551, 552. (Same as Aerospace Engineering 651-52 and Mechanical Engineering 661-62.)

653-54 Advanced Topics in Computational Solid Mechanics (3,3) Fracture mechanics; singularity solutions; high performance computing 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 653-54 and Mechanical Engineering 663-64.)

657 Computational Mechanics Seminar (1) Current developments in computational 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 individual. Prereq: Consent 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 UTSM campuses.

GRADUATE COURSES


451 Systems and Controls (3) Analytical models of physical systems; comprised of combinations of mechanical, fluid, electrical, and thermal systems. Analysis and design of feedback control systems using transient and frequency response techniques, stability analysis, sampled data systems. Prereq: 345 Instrumentation and Measurement, Electrical and Computer Engineering 301 Circuits and Electro Mechanic Components.


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 engineering report. Prereq: Dynamics and Vibrations of Machines.

456 Introduction to Thermal Design (2) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering solid mechanics system. Participation in team design engineering report. Prereq: 332, 344.

466 Machine Design II (3) (Same as Mechanical Engineering 510.)

467 Thermal Engineering Design (3) Thermal systems, thermodynamics, exergy exchanges, combustion and system analysis and design, second law and economic analysis. Prereq: 332, 346, 567.

479 Thermal Engineering Design (4) Design of complete thermal-fluid system, economic, technical and optimization aspects. Participation in team design effort, technical presentations and design report. Prereq: 456, 475.

483 Introduction to Reliability Engineering (3) (Same as Nuclear Engineering 483, Chemical Engineering 483, and Industrial Engineering 483.)

484 Introduction to Maintenance Engineering (3) (Same as Nuclear Engineering 484, Chemical Engineering 484, Electrical and Computer 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.

500 Thesis (1-15) P/NP 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.

504 Product Development Process (1) Basic elements in product development process and project management. Business and engineering interfactions to development 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 market analysis. Preferred 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 Multidisciplinary Project (1) (Same as Industrial Engineering 509.)

510 Prototype Development and Evaluation (3) Prototype of selected product 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 to marketplace. Prototype development managed using project management plan. Prereq: 555.

511 Heat Transfer I (3) (Same as Chemical Engineering 511.)

512 Heat Transfer II (3) (Same as Chemical Engineering 512.)

520 Selected Topics in Mechanical Engineering (1-4, 1-4) Problems and topics related to developments and practice in mechanical engineering. Prereq: Consent of instructor.


523 Phase Change Heat Transfer (3) Mechanics of nucleation, growth and filmwise condensation; critical heat flux; forced convection boiling and post dry-out heat transfer; condensation processes; heterogeneous nucleation; dropletwise and filmwise condensation; flow condensation; liquid-solid phase change processes; moving phase fronts; mathe- ematical modeling. Prereq: 544, 511.

521-22 Thermodynamics I and II (3,3) Macrosopic thermodynamics, including First and Second Law analyses, availability, phase and chemical equilibrium criteria, combustion, gas mixtures, and property relations. Determination of thermodynamic properties from molecular structure, spectroscopic data, kinetic theory, statistical mechanics, quantum physics, Schrodinger equation. Prereq: 330.

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 I (3) Fundamentals of homogeneous mixture combustion and non-reacting flows. Equations of gas dynamics and conservation equations; phenomenological approach to laminar flames; diffusion and premixed flame theory; single droplet combustion; deflagration and detonation combustion; combustion of combustible gases and waves in laminar streams; laminar burning velocity; heat transfer to turbulent flames. Prereq: 522, 541, or consent of instructor.

526 Combustion and Chemically Reacting Flows II (3) Advanced theory of laminar and turbulent premixed and non-premixed flames; computational fluid dynamics; fluidized bed combustion; chemically reacting boundary layer flows; gas turbine and rocket engine combustion; traveling wave flames; ground testing; introduction to solid propellant rockets. Prereq: Consent of instructor.

527 Thermal Systems Analysis (3) Application of basic principles of heat transfer, fluid mechanics, and thermodynamics to the analysis of heat and material flow in systems. Prereq: Mathematics 431 or Engineering Analysis, (Same as Aerospace Engineering 533 and Engineering Science 533.)

528 Rocket Propulsion I (3)Rocket propulsion fundamentals; chemistry of non-reacting and chemically reacting ideal gases, rocket nozzle design; ideal rocket performance parameters; rocket heat transfer; chemical kinetics of rocket engine systems; ground testing; introduction to solid propellant rockets. Prereq: Consent of instructor.

529 Rocket Propulsion II (3) Solid propellant rocket performance, homogeneous and heterogeneous propellant chemistry and combustion system performance, rocket mixture design, thermal decomposition and gas phase reaction models; effect of chamber pressure and additives on solid propellant burn rates; droplet burning; analysis of two-phase solid rocket exhaust flow. Introduction to nuclear and electric propulsion; electrical resistance and electric field; multi-phase flow; liquid hydrous thrusters, traveling wave thrusters, exotic propulsion systems. Prereq: Consent of instructor.

584-85 Turbomachinery Systems I, II (3,3) Ideal cycle analysis of turbine engines, real cycle analysis, component performance analysis, component design and systems integration (inlets, nozzles, combustors, 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.


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 Culminating 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 UTShi. May be repeated. S/NC only.

599 Special Topics in Mechanical Engineering (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

601 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, multiphase 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: 527.

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.

621 Advanced Topics in Solid Mechanics (3) Advanced topics in solid mechanics, dynamics, vibrations, and strength of materials. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

642 Advanced Topics in Thermodynamics (3) Comparison of macroscopic and microscopic approaches to equilibrium of pure substances, metastable states. Non-equilibrium thermodynamics. Prereq: Consent of instructor.

651-52 Advanced Topics in Computational Fluid Dynamics I, II (3,3) Advanced topics in mathematical modeling and computer analysis of fluid flow. Prereq: 527.


671 Advanced Topics in Applied Artificial Intelligence (3) (Same as Nuclear Engineering 671 and Engineering Science 671.)

686 Telerobotics (3) Analysis of modern telerobotics concepts: review of current research and literature in telerobotics, comparison of teleoperated systems, robotic 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
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.
420 Medical Microbiology (3) Disease-producing microorganisms, including bacteria, rickettsia, chlamydia and fungi. Prereq: Introduction to Microbiology.
429 Medical Microbiology Laboratory (2) Laboratory exercises in medically important areas of microbiology: microorganisms, pathogenesis and immunology. Prereq: Introduction to Microbiology Lab. Coreq: 420.
430 Immunology (3) Principles of inflammation and immunity; immunoglobulin structure and theories of formation and diversity; complement, hypersensitivity, cell cooperation and recognitions in immune mechanisms; soluble factors. Prereq: General Genetics.
470 Microbial Ecology (3) Physiological diversity and taxonomy of microorganisms from natural environments. Functional role of microorganisms in natural and simulated ecosystems. Prereq: 310.
500 Thesis (1-15) P/NP 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.
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.
596 Laboratory Rotation (1) Familiarization with research areas in department through series of rotations in laboratories of individual faculty members. May be repeated. Maximum 18 hrs. S/NC only.
600 Doctoral Research and Dissertation (3-15) P/NP only.
601 Journal Club in Microbial Physiology (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only.
602 Journal Club in Microbial Pathogenesis (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only.
603 Journal Club in Immunology (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only.
604 Journal Club in Virology (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only.
605 Journal Club in Microbial Genetics (1) Readings and discussions based on current literature. May be repeated. Maximum 18 hrs. S/NC only.
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.

Microbiology-Veterinary Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

Modern Foreign Languages and Literatures

(College of Arts and Sciences)

MAJORS DEGREES

French .................................................. M.A.
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 30 semester hours of 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 519-20. 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. A research paper from a course, which the candidate substantially expands with the approval of the committee.
3. A written examination covering the coursework and selected items from a master reading list.
4. A final oral examination covering the research paper.

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 course above 500. A maximum of three 400-level courses may be counted toward the 24 semester hours of course credit. All M.A. candidates must sit for a standardized language examination, such as the Zentrale Mittelstufenprüfung. Students who are interested in future Ph.D. level study are strongly advised to choose the thesis option.

Non-Thesis Option: The minimum requirements are 30 semester hours of coursework, including at least one 600-level course, for which a seminar paper is required. German 510 and 519-20 are required, as are three courses on German literature or culture, one of which may be at the 400 level. In addition, students must take three further courses, only one of which may be chosen from 411-12 or 485. All graduate teaching assistants should take 512, and other candidates may take 512 or any other course above 500. 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 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 550. Under certain conditions, the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours must be taken in the major, 6 in the minor.
2. Three term papers that have been accepted by the student’s advisory committee.
3. A written examination covering the coursework and selected items from a master reading list.

THE DOCTORAL PROGRAM

The Ph.D. in Modern Foreign Languages requires advanced training in a major language and either a second language or applied linguistics.

Admission Requirements

Applicants must have completed a B.A. in either French, German or Spanish to be accepted into this program. Both graduates of institutions in the United States and those with undergraduate degrees from institutions outside the United States must have a grade point average of at least 3.0. Consideration will also be given to applicants who do not have an undergraduate degree in one of the three foreign languages but do have the equivalent of an undergraduate major in one of them.

Degree Requirements

Candidates must complete a minimum of 63 semester hours of coursework beyond the bachelor’s degree in addition to 24 hours of doctoral research and dissertation.

For candidates with French or Spanish as a first concentration, two tracks are available: The coursework for Track I must be distributed as follows: at least 39 hours in the first concentration; at least 18 hours in the second concentration; and at least 6 hours in a cognate field 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 concentra-
tion, 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: A minimum of either 39 (Track I) or 45 (Track II) hours of French or Spanish courses beyond the bachelor’s degree, as distributed as follows:

   400 level: A maximum of 6 hours of 400-level classes taken for the M.A. may be applied.

   500 level: A minimum of 21 hours must be taken. These must include French 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.

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 or 510, 512, 21 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, McClure, Rotary fellowships).

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.


411 French Literature of the 16th Century (3) Highights of 16th-century French literature. Excerpts from Rabelais and Montaigne; readings 12 poems to writers from Lyon and members of Pliade. Prereq: 300-level literature course.


413 French Literature of the 18th Century (3) Major works of Enlightenment. Prereq: 300-level literature course.


419 German Fairy Tales and Literary Fantasies (3) How and why forms of literary fantasies ranging from apocalyptic dreams to enchanted visions have changed over the centuries. Strong interdisciplinary component, tracing interconnections between philosophy, psychology, religion and literary history, as well as exploring the relationship between literary, musical and artistic representations of specific themes. Prereq: 6 hours of 300 courses or equivalent, excluding 331-332.

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.)


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. Stress on class comprehension and immediate prepara- tion. Prereq: Intermediate Composi- tion and Conversation or French for Business. 2 hrs weekly.

425 Introduction to Descriptive Linguistics (3) Theory and practice of techniques of linguistic analy- sis in subfields of phonetics, 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 clas- sical Latin through 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, arts and crafts, all arts of France. 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 major portion of the course.

434 Literature of Quebec (3) Survey of literature of Quebec as well as French literature connected with North America. Readings include explorer and mis- sionary works, such as 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. The approach is designed 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.

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) 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.
510 The French Language (3) French as spoken and written from Medieval period to present.

512 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and foreign language skills, and cultural aspects through seminars, demonstrations, peer teaching, and observation of foreign language classes. 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 culture through film.

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-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.

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/N/C.

594-95 French Directed Readings (3,3) 600 Doctoral Research and Dissertation (3-15) (same as Linguistics 425.)

415 Special Topics (3) Topics vary. May be repeated. Maximum 6 hrs.

416 Metropolis Revisited (3) The 20th Century German or Austrian metropolis in the mirror of history, literature, theory, art, architecture, and music. Taught in English. Prereq: 6 hrs of upper-division German language courses, enrollment in that sequence and consent of instructor.

419 German Fairy Tales and Literary Fantasies (3) How and why of literary fantasies ranging from apocalyptic dreams to enchanted visions that have changed over the centuries. Strong interdisciplinary component, focusing on literary and artistic forms and the sciences. Comparative analyses of literary and non-fictional texts, films, and other media. Prereq: 6 hrs of upper division German language courses (excluding courses in translation or graduate reading courses). (Same as Linguistics 436.)

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.

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. Surveys linguistic change, language families, Proto-Indo-European, and other proto languages. Prereq: 6 hrs of upper division German language courses (excluding courses in translation or graduate reading courses). (Same as French 426, Spanish 426, and Linguistics 426.)

431 Images of Nature and the Body in German Culture (3) Representations of nature from idiomatic expression and object to scientific subject and precious resource. Other themes include sexuality, the body, childhood, and aging. Discussions based on literary and documentary texts and films. Prereq: 6 hrs of 300 courses or equivalent, excluding 331-332.

432 German Creative Thinking: Interdisciplinary Dialogues (3) Interdisciplinary connections between German literature and art, music, philosophy, theatrical praxis, psychology, dance, anthropology, history, and the sciences. Comparative analyses of literary and non-fictional texts, films, and other media. Prereq: 6 hrs of 300 courses or equivalent, excluding 331-332.

433 Nation, Race, and Ethnicity (3) Examination of cultural constructions of nation, race, and ethnicity and how and how they have challenged each other and developed as German social constructs since the eighteenth century. Close study and analysis of fiction, non-fiction, and films that address controversial topics such as assimilation, integration, racial/ethnic identity formation and multiculturalism. Prereq: 6 hrs of 300 courses or equivalent, excluding 331-332.

434 Extraordinary Wo(Men)-Outcasts, Rebels, Martyrs and Saints (3) Examination of German texts and visual media that have challenged mainstream thinking throughout the centuries. Strong interdisciplinary component, focusing on literary and artistic forms that depict struggles involving religion, politics and gender. Prereq: 6 hrs of 300 courses or equivalent, excluding 331-332.

435 Structure of the German Language (3) Contrastrive English-German segmental and suprasegmental phonemes, contrasting English-German linguistic structures, selected topics in advanced German grammar and syntactic analysis. Prereq: 6 hrs of upper division German 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 German 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 language courses. (Same as Linguistics 485.)

494 German Community Service Practicum (1-15) Supervised by the director of the Lower-Division German program, students either assist German classes at local schools or perform supervised service with local institutions that promote awareness of German culture among the general public. Prereq: 18 hours of upper division German courses and consent of program chair. Maximum of one hour credit per semester. May be repeated for a maximum of 3 hours.

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

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 GTAs, except those whose previous training or experience warrants excuse by department.

519 Bibliography and Methods of Research (3) Critical research tools and scholarly contributions in German literature and language. Practical exercises on compiling of scholarly data using computer-based and non-computer sources.

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. Letter grade or S/N/C.

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

621-22 Seminar in German Literature (3,3) May be repeated. Maximum 18 hrs.

631-32 Seminar in German and Germanic Philology (3,3).
Modern Foreign Languages and Literatures

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, 1400-1550. Consent of instructor. Prereq: 212 or consent of instructor.

405 Modern Italian Poetry (3) From Pascaliano 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) (Same as Cinema Studies 421.)

422 Advanced Grammar and Translation (3) Struc- ture of grammatical system of Spanish. In-depth analy- sis of selected syntactic phenomena with practical illustration/application and exercise in Spanish-English/Spanish translation. Finer points of grammatical structures. Not available to native or bilingual students of Spanish without consent of department. Prereq: 323 Intermediate Composition and Grammar.

423 Advanced Composition and Conversation (3) Development of writing and speaking skills at ad- vanced level, wide range of topics and situations. Topics may vary. Prereq: At least one course at the 300 level or the equivalent. May be repeated. Maximum 12 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.

430 Selected Topics in Russian Literature (3) Con- tent 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 major novels or works by authors not normally included in the Russian Composition and Grammar course. Prereq: Consent of instructor.

510 Russian Phonetics and Advanced Grammar (3) Phonetics, pronunciation, stylistics, and selected topics in Russian grammar. For teachers and pros- pective teachers. Prereq: Consent of instructor.

550 Studies in Russian Literature (3) Content var- ies. 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 Conversa- tion and Composition or consent of instructor.

422 Advanced Grammar and Translation (3) Struc- ture of grammatical system of Spanish. In-depth analy- sis of selected syntactic phenomena with practical illustration/application and exercise in Spanish-English/Spanish translation. Finer points of grammatical structures. Not available to native or bilingual students of Spanish without consent of department. Prereq: 323 Intermediate Composition and Grammar.

423 Advanced Composition and Conversation (3) Development of writing and speaking skills at ad- vanced level, wide range of topics and situations. Topics may vary. Prereq: At least one course at the 300 level or the equivalent. May be repeated. Maximum 12 hrs.

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: pho- nology, 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 American Literature: 1700- Present and completion of an additional 9 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 female individuality to particular social context, role of women in society, patriarchal tradition, woman as cultural and as aesthetic value (“the femi- nine symbolic”), and feminist theoretical issues. Prereq: 323 Intermediate Composition and Grammar. (Same as Latin American Studies 433.)

434 Hispanic Culture through Film (3) Analysis of selected films on subjects concerning life, culture, and artistry of Hispanics in the Hispanic world. Prereq: Consent of department. Prereq: 323 Intermediate Composition and Grammar, 332 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. May be repeated. Maximum 6 hrs with consent of department. May be repeated. Maximum 6 hrs with consent of department. (Same as Cinema Studies 434.)

465 Latin American Film and Culture (3) Latin Amer- ican and Latino/a films and videos from 1900s to present as works of art and in light of political, cultural, and social contexts. Taught in English. Graduate credit available only for Latin American Studies and Cinema Studies majors. 1 hr lecture, 2 hrs screening, and 1 hr discussion. (Same as Latin American Studies 465 and Cinema Studies 465.)


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. Taught in Spanish. Taught in Spanish Literature 157. Prereq: 323 Intermediate Composition and Grammar, 332 Survey of Spanish Literature: 1700- Present,.externship, 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, or movements from historical peri- ods 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 Litera- ture (3) Close reading and analysis of literary texts that address issues of race and ethnicity in Hispanic and world, with regard to identity and concepts of nation- hood. Topics: mestizaje; conceptual distinctions be- tween race and ethnicity in Latin America; indigenismo; afrocentrism; issues of monarchy and empire; rela- tionship 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 His- panic World (3) Relationships (thematic, cultural, socio-political, aesthetic, philosophical, etc.) between specific trends in literature and other artistic media, in light of historical contexts in which those relationships emerged. 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.

489 Topics in Hispanic Civilization (3) Analysis of major trends, issues and/or movements in the civiliza- tions of Spain and Spanish America. Political, literary, and cultural perspectives dealing with topics from Middle Ages to present day. 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) P/NP only.

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

Portuguese

GRADUATE COURSES

400 Portuguese for Speakers of Another Romance Language (3) Accelerated class for beginning stu- dents of Portuguese with strong background in an- other Romance language. Introduction to grammar, reading and culture of Portugal and Brazil. Prereq: 3 hours at the 300 level in another Romance language or equivalent.

431-32 Topics in the Literature and Language of Portuguese-speaking World (3,3) Outstanding works of literature and culture from Portuguese countries. Topics may vary. Prereq: At least one course at the 300 level or the equivalent. May be repeated. Maximum 12 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.

Russian

GRADUATE COURSES

401-02 Advanced Grammar, Conversation, and Com- position (3,3) Prereq: Russian Composition and Conversation or equivalent.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, Spanish 425, and Linguistics 425.)

426 Methods of Historical Linguistics (3) (Same as French 426, German 426, Spanish 426, and Linguis- tics 426.)
512 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and cultural aspects through seminars, demonstrations, peer teaching, and observation of foreign language classes. Required of all M.A. and Ph.D. students holding Graduate Teaching Assistantships, except those whose previous training or experience warrants their being excluded by department.

531 Old Spanish (3) Evolution of Spanish language from its origins through 15th century.

532 Medieval Spanish Literature (3) Literary works of 11th through 15th century. Application of literary theories to understanding of literature, nature and evolution of major literary genres during Spanish Middle Ages, and socio-historical contexts of medieval works. May be repeated. Maximum 6 hrs with consent of department.

533 Golden Age Prose (3) Wide range of prose fiction in Spain during 16th and 17th centuries: Moorish, picaroque, sentimental, pastoral and exemplary novels, and dialogues.

534 Don Quijote (3) Cervantes' masterpiece in socio-cultural and literary context of its time: study of thematic, structural and stylistic issues: crisis of aristocracy, Quijotico "madness," discrepant cognitive and ethical perspectives, satiric irony, culture of 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 Góngora.

537 Golden Age Drama (3) Major dramatists of period: Lope de Vega, Tirso de Molina, Ruiz de Alarcón, Guilén de Castro, Calderón de la Barca, Moreto, and Rojas Zorrilla.

540 Spanish Romanticism (3) Major dramatists and poets representative of Romantic movement in Spain studied in historical perspective of 18th and 19th centuries: Feijoo, Cadalso, Duque de Rivas, Larra, Espronceda, Zorrilla, Hertzenbusch, Bécquer, Rosalía de Castro. Content may be repeated. Maximum 6 hrs with consent of department.

541 19th-Century Spanish Prose (3) Costumbrismo, realism, and naturalism in the novel, short story, and essay as represented in major authors: Larra, Mesonero Romanos, Fernán Caballero, Alarcón, Valera, Palacio Valdés, Pereda, Galdós, 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 counterparts. Indigenous texts and authors. 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 attributable to such factors as race, geography, immigration, and economic development. Key regions include Mexico and Central America, Caribbean, Andean countries, and the Southern Cone. Comparisons vary between specific regional perspective and transregional one. Content varies. May be repeated. Maximum 6 hrs with consent of department.

574 Spanish American Modernism and Vanguardismo (3) Critical study of modern writers and literary works associated with Spanish American modernismo and vanguardismo published between 1868 and 1950. Concepts and expressions of modernity are discussed in relation to specific works. Content varies. May be repeated. Maximum 6 hrs with consent of department.

575 Spanish American Modernism and Vanguardismo (3) Critical study of major projects of modernist groups in Spanish America from 1900 to present. Content varies. May be repeated. Maximum 6 hrs with consent of department.

576 Contemporary Spanish American Poetry (3) Critical study of major poets of Spanish America from 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 American'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 published throughout 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/N.C.

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

621 Seminar in Spanish Language (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:  

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  

Leach, C. F., D.M.  ............... Northwestern  

MacMinn, 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  

Stutzer, Germany, D. R., D.M.A.  Maryland  

Associate Professors:  

Adams, Fay, M.M.  .............. Tennessee  

Batye, 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.  ...... Tennessee  

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, Jr., L. C., Ph.D.  .......... Columbia  

Hough, Donald, M.M.  .......... Tennessee  

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  

Spera, G. R., M.M.  .......... Indiana  

Stephens, M. B., M.M.  ....... Ohio State  

Wentzel, A. N., M.M.  .......... Southern Cal  

Zelminovich, Matus, M.A.  .... Loyola

Assistant Professors:  

Al-Taeu, N., Ph.D.  .......... UCLA  

Baldwin, Wesley, D.M.A.  ....... Maryland  

Carlson, R. G., Ph.D.  .......... UNC, Chapel Hill  

Ewell, P., Ph.D.  ............... Yale  

Haar, Paul, M.M.  ............... Kansas  

Hawthorne, W., Ph.D.  .......... Cincinnati  

Lee, Christy, D.M.  ............. Florida State  

Powell, Edward, D.M.A.  ...... North Texas  

Richter, Jorge, M.M.  .......... Andrews  

Ryder, Donald, D.M.A.  ....... Iowa

MISSION STATEMENT

The School of Music provides specialized training in music to prepare students for professional work or advanced study; for teaching music in the elementary and secondary schools, and in higher education; and for general cultural enrichment.

The curriculum of the School of Music, therefore, is designed to present the learning of music as an integrated whole. Solo and ensemble performance, theoretical and historical studies, concert attendance, and electives both within and outside the school are intended to provide a balanced education. The School also provides general music studies and performance.

PROGRAMS

The School of Music offers the Master of Music degree with a concentration 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, piano, organ, strings, voice, piano, organ, strings, voice
winds, and percussion), and pedagogy (piano or vocal).

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.
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 theater. Prereq or coreq: 570. May be repeated. Maximum 2 hrs.
574 Analysis for Teaching for Professional Development (2) Strategies to document and analyze effectiveness of teaching and professional development. Study and application of various approaches. Coreq: 575.
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.
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 seminars during full-time internship. Application and evaluation of professional core 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.
503 Small Jazz Ensemble (1) May be repeated. Maximum 12 hrs.
504 Jazz Ensemble (1) May be repeated.
505 Studio Orchestra (1) May be repeated. Maximum 12 hrs.
506 Trombone Choir (1) May be repeated.
510 Percussion Ensemble (1) May be repeated.
511 Marimba Choir (1) May be repeated.
515 Chamber Music Ensemble (1) May be repeated. Maximum 12 hrs.
520 UT Singers (1) May be repeated.
530 Chamber Singers (1) May be repeated.
540 Opera Theatre (1) May be repeated.
550 Concert Band (1) May be repeated.
552 Symphonic Band (1) May be repeated. Maximum 12 hrs.
553 Wind Ensemble (1) May be repeated. Maximum 12 hrs.
554 Varsity Band (1) May be repeated.
559 Marching Band (1) May be repeated.
570 Symphony Orchestra (1) May be repeated.
580 Concert Choir (1) May be repeated.
589 Women’s Chorale (1) May be repeated.
599 Accompanying (1) May be repeated.

Music General

GRADUATE COURSES

500 Thesis (1-15) P/NP only.
501 Graduate Recital (2)
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 Music Bibliography (3) Bibliographic methodology in music.
511 Lecture Recital (2)
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.
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.

Music History

GRADUATE COURSES

410 Music History Genre (3) Topics vary. May be repeated. Maximum 6 hrs.
420 History of Opera (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 a scholarly discipline. History, theories, and methodologies as applied to study of music in culture. Prereq: Music in World Culture or equivalent.
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 580 and equivalent.

580 Band History and Literature I (3) Antiquity to 1900. Prereq: Consent of instructor.

581 Band History and Literature II (3) 1900 to present. Prereq: 590 and consent of instructor.

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 juried performance of band or orchestral work(s). Prereq: Consent of instructor.

Music Performance

GRADUATE COURSES

531-41 Recital Project (2,2) Preparation and accompaniment of full recital for accompanying concentrations only. 531—Vocal recital, 541—Instrumental recital. Prereq: Consent of instructor.

540-50 Advanced Piano Pedagogy I, II (2,2) 540—Evaluation and study of methods and materials for teaching piano at all levels. Supervised laboratory teaching. Prereq: Consent of instructor. 550—Introduction and principles of Kodaly, Orff, Suzuki, Dalcroze Eurhythmics, and class piano teaching. Prereq: Consent of instructor.

560 Organ Literature Seminar (3) Topics vary. May be repeated. Maximum 6 hrs.

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 Computer Projects (3) High-level programming languages used to design and implement computer-managed instruction; Internet development tools; writing of documentation for computer projects. Prereq: 540 or equivalent.

560 Technology in Music Research (3) Use of technology for research projects in music analysis or pedagogy: development and execution of research project. Prereq: 550.
fulfill deficiency requirements for graduate students in voice or accompanying.

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 6 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.

565 Special Projects in Vocal Pedagogy (3) Course is available only for graduate students majoring in vocal pedagogy. Prereq: Consent of instructor.

570 Vocal Chamber Music Performance (2) Prereq: Consent of instructor.

575 Internship in Vocal Pedagogy I (1) Opportunity for vocal pedagogy students to develop and improve applied teaching skills through a shared practicum experience in a seminar setting. Includes supervised instruction. Available only for graduate students majoring in vocal pedagogy. Prereq: Consent of instructor. May be repeated. Maximum 2 hours.

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 (2) Expansion and continued refinement of conducting technique. Score reading and preparation, rehearsal techniques, and interpretation of styles and performance practices. May be repeated. Maximum 8 hours.

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) Topics vary. Prereq: 590 or consent of instructor. May be repeated.

Research Assistants Professors

A.V. Gribok, Ph.D. .......... Russia (IPPE) H.M. Moussa, Ph.D. .......... Tennessee

Emeriti Faculty

Uhrig, R.E., Ph.D. .......... Iowa State

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 fissile 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 all projects.

The M.S. degree in nuclear engineering program is also available to distance students via selected courses that are delivered synchronously over the web to the student’s computer. More detailed information about this distance program is located at http://www.anywhere.tennessee.edu/ne/default.htm.

THE DOCTORAL PROGRAM

Students in the field of nuclear engineering desiring to study for the Doctor of Philosophy degree must have a Bachelor of Science or Master of Science from a recognized university with a major in engineering, physics, chemistry, biology, or mathematics. All candidates are required to demonstrate general competence in a comprehensive examination in the areas of engineering science, mathematics, chemistry, physics, and nuclear engineering.

Specific requirements for the Ph.D. in nuclear engineering include:

1. A minimum of 48 semester hours beyond the bachelor’s degree, exclusive of credit for the M.S. thesis or nuclear engineering practice.
2. A minimum of 24 semester hours in doctoral research, Nuclear Engineering 600. 3. A minimum of 30 semester hours in nuclear engineering courses numbered 500 and above (or the equivalent), with at least 9 semester hours of 600-level courses. These are exclusive of thesis or dissertation credit.
4. A minimum of 12 semester hours in mathematics, computer science, or statistics courses beyond nuclear engineering undergraduate requirements numbered 400 or above.
5. A minimum of 6 semester hours in courses numbered 500 or above from a department other than nuclear engineering.

The choice depends on the student’s overall program and should expand his/her knowledge in a given field.

The first part of the comprehensive examination is prepared by the nuclear engineering faculty and consists of 12 hours of written examination that is administered over a three-day period. All past written examinations are filed in the library, and students are encouraged to review them. Students are invited to take the written
examination after completing approximately 30 semester hours of graduate coursework. A student who fails the written examination must take and pass the examination the next time it is offered to remain in the Ph.D. program. Registration for 600 is not permitted unless the written examination is passed. The second part of the comprehensive examination is completed with the successful oral defense of a written dissertation proposal. A candidate must successfully defend, in an oral examination, 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,
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.

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 582 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. Applicants must meet the minimum criteria established by the Graduate Council. Students without a nuclear engineering background must take 301 (Fundamentals of Nuclear and Radiological Engineering) prior to beginning the graduate coursework described above.

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 1 (3) Cross section measurements, diffusion properties of neutrons, shielding, dynamics and controls, alpha and beta spectroscopy, radiation field and dosimetry. Prereq: Nuclear and Radiological Engineering Laboratory 1. 404 Nuclear Fuel Cycle 3 (3) Mining, millling, fabrication, in-core management, reprocessing, waste disposal, regulatory and radiation health issues and requirements. Prereq: 470 or equivalent. 406 Radiation Shielding 3 (3) Types of radiation sources, shielding, 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 (3) Fundamentals of nuclear criticality safety; criticality accidents; safety standards; overview of experiments, computational methods, and applications. Prereq: 301 Fundamentals of Nuclear/Radiological Engineering. 431 Radiation Protection 3 (3) External and internal dosimetry; biological effects of radiation, radiation detection, radiation risk assessment. Prereq: 301 Fundamentals of Nuclear/Radiological Engineering. 432 Radiation Risk Analysis 3 (3) Radiation risk estimates for external and internal radiation, dose-relevant models, dose rate effects, prediction of radiation risks, radiation safety standards. 470 Nuclear Reactor Theory I 3 (3) Fundamentals of reactor physics relative to cross sections, kinematics of elastic scattering, reactor kinetics, reactor systems and nuclear data. Prereq: Senior standing and consent of instructor. (Same as Chemical Engineering 483, Industrial Engineering 483, and Mechanical Engineering 483.) 484 Introduction to Maintenance Engineering 3 (3) Principles of maintenance and reliability engineering and maintenance management. Information extraction from machinery measurements, rotating machinery diagnostics, nondestructive testing, life prediction; failure models, lubrication oil analysis, establishing predictive maintenance program, and computerized maintenance management systems. Prereq: Senior standing and consent of instructor. (Same as Chemical Engineering 484, Industrial Engineering 484, Materials Science and Engineering 484, and Mechanical Engineering 484.) 494 Special Topics in Nuclear Engineering 3 (3) Problems related to reactor physics, reactor safety, and reactor operation. Prereq: Senior standing and consent of instructor. May be repeated. Maximum 6 hrs. 500 Thesis 1-15 P/NP 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. 511-12 Transport Processes in Nuclear Engineering 3, 3 (3) Rhelology 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 (3) Introduction to state variable methods for system dynamics and control analysis and application of these methods to nuclear plant dynamics, simulation and control problems. 522 Experimental Methods in Reactor Dynamics 3 (3) Introduction to time domain and frequency domain techniques. Measurement, analysis, and interpretation of process signals for reactor surveillance and diagnostics. Introduction to time-series modeling. Prereq: 521. 541 Reactor Fuel Management 3 (3) Topics relative to in-core fuel management. Applicable topics in reactor physics, fuel management, systems analysis, control and computational methods. Prereq: Consent of instructor. 542 Management of Radioactive Materials 3 (3) Technology for processing, treatment, handling and storage of radioactive nuclides. Analytical and numerical methods for evaluating environmental impact of radioactive materials. Licensing and regulation issues. 543 Selected Topics in Nuclear Criticality Safety 3 (3) Criticality safety computational and experimental methods for enrichment, reprocessing, and transport applications; overview of safety practices and regulatory requirements. Prereq: 421 or consent of instructor. 550 Radiation Measurements Laboratory 3 (3) Physics and electronics associated with radiation detection and measurement, methods of data analysis. Applicability of particular detector measurements and fundamentals of radiation detection instrumentation operation. Prereq: 551. 551 Radiation Protection 3 (3) Fundamental concepts and definitions used in radiation protection. Interactions of photons, neutrons and heavy charged particles with matter and mechanisms of energy loss. Chemical and biological effects of radiation. Introduction to current radiation protection standards and regulations. Prereq: 301 Fundamentals of Nuclear/Radiological Engineering. 552 Radiological Assessment and Dosimetry 3 (3) Transport of radionuclides in environment, food chain pathways, internal dosimetry and personnel dosimetry. Prereq: 551 or consent of instructor. 553 Radiation Risk Analysis 3 (3) Methods for radiation risk prediction, survival analysis, parameter estimation, real data analysis, extrapolation techniques. Prereq: 552 or consent of instructor. 557 Medical Physics I 3 (3) Ionizing radiation use in radiation therapy to cause controlled biological effects in cancer patients. Physics 57 of interaction of various radiation modalities with body equivalent materials and physical aspects of clinical applications. Lecture and lab. Prereq: Consent of instructor. 558 Medical Physics II 3 (3) Physics of ionizing radiation therapy with emphasis on quality assurance, treatment planning, radiation protection, and special treatment procedures. Lecture and lab. Prereq: 557. 567 Reactor Theory and Design 3 (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. Prereq: 470 or consent of instructor. 572 Nuclear System Design 3 (3) Design and analysis of a nuclear system, interface with non-nuclear aspects of system design: system reliability and economics; class project. Prereq: Consent of instructor. 577 Neural Networks in Engineering 3 (3) Neural networks, neural networks and their applications, neural networks, and computational intelligence. Prereq: Consent of instructor. Prereq: 577 and Engineering Science 377. 578 Fuzzy Systems in Engineering 3 (3) Fuzzy numbers, fuzzy environment, uncertainty and randomness, approximate reasoning, fuzzy models and structures, decision process in fuzzy environment, fuzzy computing, fuzzy logic controllers, fuzzy expert systems and other engineering applications. (Same as Engineering Science 578.)
Nursing

(College of Nursing)

MAJOR DEGREE

Nursing ........................................ M.S.N., Ph.D.

Joan L. Creasia, Dean
Sandra McGuire, Chair of M.S.N. Program
Sandra Thomas, Chair of Ph.D. Program

Professors:


Associate Professors:


Assistant Professors:


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.

Admissions 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.

THE DOCTOR'S PROGRAM

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 for nurse anesthesia students.

6. New students normally are admitted to the program only at the beginning of fall semester. However, under special circumstances, space may be available. 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. Nurse anesthesia applications must be received by March 1 for spring admission.

Non-Degree Status

Only 503, 505, 510, 511, and 515 are open to students in Non-Degrees Status. Students not yet accepted into the Master's Program must see the Chair of the MSN Program for advising prior to enrolling in any course.

Special Requirements

1. Each student must hold personal professional liability insurance and health 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 applicant 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
THE DOCTORAL PROGRAM

The College of Nursing offers a doctoral program leading to the Doctor of Philosophy degree with a major in Nursing. This is a unified program offered jointly with the University of Tennessee, Memphis, College of Nursing. Students may complete all or part of the program at either site. The dissertation must be completed in its entirety at one site. The doctoral program prepares nursing scholars capable of integrating research, theory, and practice into their roles as researchers, educators, and/or administrators. Specifically, the graduate of this program should be able to:

1. Analyze, test, refine, 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 grade point average of 3.3 on a 4.0 scale for previous college work.
Program Requirements
The following courses are required for all students:

- 601 Nursing Knowledge Development (3)
- 602 Theory Analysis and Construction (3)
- 603 Nursing 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 (3)
- 611 Advanced Nursing Seminar (2)
- 612 Health and Nursing Policy/Planning (3)
- 613 Nursing Leadership in Complex Systems
  - 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 representative from the cognate area. The student then selects the dissertation committee. Four faculty holding the rank of assistant professor or above comprise the committee, three of whom (including the chair) must be approved by the Graduate Council to direct doctoral dissertations. At least one member of the committee must be from an academic unit other than nursing.

Special Policies
1. A maximum of 6 graduate hours taken before acceptance into the doctoral program may be applied toward the degree.
2. A minimum grade of B in all nursing doctoral courses and a 3.0 cumulative GPA are required for continuation in the program.

Nursing Education Minor
Graduate students in the College of Nursing may pursue a Nursing Education Minor. The minor consists of 12 hours: 6 hours in Nursing and 6 in Education.

Required courses in the College of Nursing are 566 Education Principles and Strategies (3) and 565 Nursing Education Practicum (3). Students select from a listing of courses in the College of Education, Health, and Human Sciences (see CON Graduate Handbook for listing) or make these at the discretion of the student and advisor.

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 concentrations.

POST-MASTER'S CERTIFICATES
The College of Nursing offers post-master's certificate programs for nurses who need additional training. A master's degree in nursing is required for admission.

The total hours will vary depending on the student's academic record, clinical experience and objectives. Students must complete a minimum of 12 credits. Most students complete 16-20 hours of course credit with the exception of those pursuing the nurse anesthesia certificate. Typically, this certificate program requires students who have completed the master's degree in nursing within the preceding five years to complete 60-70 hours of course credit. Contact the MSN chair for more information.

• Adult Health Nursing
  - Course requirements are 530, 531, and 572, plus additional hours as determined by the college.

• Family Nurse Practitioner
  - Course requirements are 570, 571, and 572, plus additional hours as determined by the college.

• Mental Health Nursing
  - Course requirements are 560 and 561, plus additional hours as determined by the college.

• Nurse Anesthesia
  - 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. One year of 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, 516, 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.

• Nursing Administration
  - Course requirements are 590 and 591, plus additional hours as determined by the college.

• Nursing Education
  - The Post-Master's Certificate in Nursing Education consists of 12 hours: 6 hours in Nursing and 6 in Education. Required courses in the College of Nursing are 566 Education Principles and Strategies (3) and 565 Nursing Education Practicum (3). Students select from a listing of courses in the College of Education, Health, and Human Sciences (see CON Graduate Handbook for listing) or make these at the discretion of the student and advisor.

• Nursing of Women and Children
  - Course requirements are 550 and 551, plus additional hours as determined by the college.

GRADUATE COURSES

400 Aging and Society (3) An examination of the health and social effects of longevity and the aging process including societal and personal attitudes about old age. Resources, trends, issues, and potentials of aging are explored. Volunteer community service, a service learning component, is required. Open to students in all colleges.

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

501 Nursing Research: Methods, Design, and Analysis (3) Basic principles of research process in application to clinical questions; critical evaluation of nursing and health-related research. Prerequisite: coreq: Graduate level statistics.

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.

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. Prerequisite: 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. Prerequisite: Admission to MSN program or consent of instructor. Didactic (2.5) and lab (1.5).

505 Advanced Clinical Pharmacology (3) Pharmacological agents utilized to treat common, recurrent health problems; indications, contraindications, side and interactive effects of commonly prescribed drugs. Prerequisite: Undergraduate pharmacology course or consent of instructor.

506 Advanced Anesthesia Pharmacology (3) Continuation of 505. Pharmacological implications of anesthetic delivery to acutely ill patients with multisystem influences. Advanced states of illness, extremes of age, and co-morbidities. Agents used in general
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: 541. Didactic (2) and practicum (4).


550 Nursing of Women and Children I (8) Advanced practical experience in women's health, focusing on the unique health needs of women and children. Prereq: 504, 505, 515. Prereq or coreq: 503, 510, 520. Didactic (3) and practicum (5).

551 Nursing of Women and Children II (8) Continuation of 550. Role refinement of nurse practitioner or clinical specialist in women's health and restoration for women, children, and families. Prereq: 550, 515. Prereq or coreq: 582. Didactic (3) and practicum (4).


570 Family Nurse Practitioner I (4) Application of advanced health care skills and diagnostic reasoning in the health care of individuals and families. Prereq: 504, 505, 515. Didactic (2) and practicum (2).

571 Family Nurse Practitioner II (6) Continuation of 570. Prereq or coreq: 503, 510, 520. Didactic (2) and practicum (4).

582 Scholarly Inquiry for Advanced Practice Nursing (3) Utilization of research process through experience, critical evaluation of science in area of interest under faculty guidance culminating in scholarly paper. Prereq or coreq: 501 or consent of instructor. May be repeated. Maximum 6 hrs.

583 Directed Clinical Practice (1-9) Additional opportunities for advanced practice nursing. Prereq: Enrollment in or completion of graduate level courses in clinical nursing. Maximum 9 hrs. S/NC or letter grade.

585 Seminar in Gerontology I (1) Coreq: 585. Prereq: Consent of instructor. Letter grade.

590 Nursing Administration: Macro-Analysis (6) Advanced analysis and application of selected organizational, management, and leadership theories and methodologies to current issues within the health care delivery and health care service systems. Prereq: 503, 510, 515, 520. Didactic (2) and practicum (4).

591 Nursing Administration: Micro-Analysis (6) Advanced analysis and application of selected organizational, management, and leadership theories and methodologies to current issues within the health care delivery and health care service systems. Prereq: 503, 510, 515, 520. Didactic (2) and practicum (4).

593 Independent Study (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

600 Doctoral Research and Dissertation (3-15) Prereq: 550, 571, 504, 505. Must be taken in sequence.

601 Nursing Knowledge Development (3) Philosophical and historical context of knowledge for nursing practice. Prereq: 550, 571, 504, 505. Must be taken in sequence.


606 Nursing Research Seminar (3) Prereq: 550, 571, 504, 505. Must be taken in sequence.

607 Quantitative Research Methods (1) Prereq: 550, 571, 504, 505. Must be taken in sequence.

608 Qualitative Research Methods (1) Prereq: 550, 571, 504, 505. Must be taken in sequence.

611 Advanced Nursing Seminar II (Exploration of historical and current issues of interest to doctorally prepared nurses.

612 Health and Nursing Policy/Planning (3) Policies affecting nursing education and practice; health care policy and political processes; interactions between health care professionals, consumer groups, and government in health policy development and health planning activities.

613 Nursing Leadership in Complex Systems (3) Analysis and evaluation of nursing leadership/management in complex professional, academic and health care systems.

614 Nursing Preceptorship (3) Prereq: 550, 571, 504, 505. Must be taken in sequence.

Nutrition

(College of Education, Health, and Human Sciences)
Human Ecology ................................. Ph.D.
Nutrition ................................. M.S., M.S.-M.P.H.

Jay Whalen, Head

Professors
Karlstad, Michael, Ph.D. ............... Loyola
Sachan, Dileep S., Ph.D. ............... Illinois
Skinner, Jean D., Ph.D. ............... Oregon State
Whelan, Jay, (Liaison), Ph.D. ....... Penn State
Zemel, Michael, (Liaison), 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
Moussa, Naima, Ph.D. .................... Paris

Assistant Professors:
Bittle, Joyce (Memphis), Ph.D. ...... Tennessee
Jones, Sonya, Ph.D. ..................... North Carolina
Kim, Jung-Han, Ph.D. ................... Tennessee
Truett, Gary, Ph.D. ..................... Georgia

The Department of Nutrition offers graduate programs leading to degrees, majors, and concentrations in:

Master of Science
Nutrition
Nutrition Science
Public Health Nutrition

Master of Science – Master of Public Health (Dual Degree)

Doctor of Philosophy
Human Ecology
Nutrition

The Master of Science program is available in Nutrition, with a concentration in nutrition science or public health nutrition.

A graduate degree combined with a Dietetic Internship (D.I.) beyond the baccalaureate degree qualifies the graduate to apply for the Registration Examination to become a Registered Dietitian (R.D.). Students may request more information from the Department about the D.I. program. The Dietetic Internship is currently granted accreditation by the Commission on Accreditation for Dietetics Education of The American Dietetic Association, 216 W. Jackson Blvd., Chicago, IL 60606-6995, Tel: 312 899-5400. Students may also select an interdisciplinary minor in gerontology.

ADMISSION REQUIREMENTS

A complete file for review includes the Graduate Application for Admission file, completed departmental application form, Graduate Record Examination (GRE) scores for the general section, and three Graduate Rating Forms completed by individuals who can attest to the applicant’s potential for graduate education. Forms may be obtained from the Departmental Office, 229 Jessie Harris Building, University of Tennessee, Knoxville, 37996-1900. Forms may also be obtained from the Department’s web site at http://nutrition.utk.edu/.

Admission into the graduate program in the department is dependent on completion of undergraduate courses that give the necessary background for success in the graduate program. Required undergraduate courses include: general and organic chemistry, physiological chemistry/biochemistry, physiology, statistics and advanced nutrition. Admission to the Ph.D. program in Human Ecology with a concentration in Nutrition Science requires a master’s degree. Applicants to all programs with related experience may be given preference.

THE MASTER’S PROGRAM

Students may choose a thesis or non-thesis option in Nutrition. Attendance at Nutrition 540 is required every semester.

Thesis Option: The program consists of a minimum of 33 hours with at least 16 hours of coursework in the department. NTR 511, 512, 540, 541 and 3 hours of graduate level statistics are required. Students in public health nutrition must take 511, 512, 513, 514, 515, 541 and the minor in public health. 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 Education, Health, and Human Sciences 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 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).

THE PH.D. PROGRAM

The Doctor of Philosophy degree enables students to study the science of nutrition from the cellular/molecular level to the application of nutrition 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.

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.

508 Culture, Food, and Nutrition (3) Food-related behavior of individuals and groups in United States. Sociocultural, economic, and technological influences. Nutrition and food surveys, public policy. Prereq: Advanced Nutrition or consent of instructor.

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 interrelationships. Prereq: Advanced Nutrition or equivalent.


513 Community Nutrition I (3) Orientation to community assessment of nutrition problems, needs, and resources; functional roles of public health nutritionists. Concurrent field experiences. Prereq: Advanced Nutrition or consent of instructor.

514 Community Nutrition II (3) Planning, implementation, and evaluation of public health nutrition programs. Concurrent field experiences. Prereq: 513 or consent of instructor.

515 Field Study in Community Nutrition (1-12) Perusal participation in and analysis of state or regional community nutrition program. Location of in-depth study to be selected in consultation with instructor. Prereq: 513, 514 and consent of instructor. S/NC only.

516 Maternal and Child Nutrition (3) Nutrition principles related to growth and development during pregnancy, infancy, and childhood to age 5, high risk conditions. Prereq: Advanced Nutrition or consent of instructor.

517 Childhood and Adolescent Nutrition (3) Application of nutrition principles to school age children; effects of diseases on growth and health maintenance; nutritional assessment and counseling for nutrition. Prereq: Advanced Nutrition or consent of instructor.

518 Nutrition and Aging (3) Nutritional problems of adults; nutritional requirements, dietary intakes; affects of nutrition on biological aging. Prereq: Advanced Nutrition or consent of instructor.

520 Nutritional Ecology (2) Examination of issues in natural, political, physical, and social environments that impact availability of food and nutrients in U.S. food supply.

521 Physiological Basis for Diet and Disease (3) Altered nutrient needs as result of metabolic changes that occur in selected disease states. Prereq: Nutrition in Disease or consent of instructor.

522 Nutrition Counseling (2) Individual eating habits and disorders, evaluation strategies for effectiveness of helping process. Prereq: Nutrition in Disease or consent of instructor.

524 Nutrition Education: Principles, Implementation, and Evaluation (3) Conceptual models, principles, application, and evaluation models in nutrition education research. Prereq: 508 or consent of instructor.

530 Molecular Application in Nutrient-Gene Interaction (1) Theories and applications of gene regulation methodologies. Experimentation with DNA and RNA. RNA and DNA isolation and analysis to illustrate nutrient regulation of gene expression. Combination of lab/lecture.

540 Seminar in Nutrition (1) May be repeated. S/NC only.

541 Research Methods (2) Basic principles of planning, conducting, and interpreting nutrition and foodservice systems administration research. Prereq: 6 graduate hrs in nutrition and food system administration and statistics.

542 Advanced Experimental Nutrition (2) Application of research principles to individual project using experimental animals. Prereq or coreq: 541.

544 Survey Methods in Food and Nutrition (2) Application of survey research methods to nutrition projects: assessment of food consumption, nutrient intake, nutritional status, sociocultural-economic parameters, food production and service. Prereq or coreq: 541.

547 Field Experience (3-9) Experience in food-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/NC only.

548 Directed Study in Nutrition (1-3) Advanced study in nutrition. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

549 Special Topics (1-3) Recent advances in nutrition or food systems administration. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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

602 Advanced Topics in Nutrition Science (1-3) Comprehensive individual study and group discussion of topics related to current problems in nutrition. Prereq: 512 or consent of instructor. May be repeated.

603 Current Trends in Food and Sociocultural Change (2) Critical evaluation of research. Prereq: 508 or consent of instructor.

Pathology

See College of Veterinary Medicine and Comparative and Experimental Medicine
Philosophy

(College of Arts and Sciences)

MAJOR DEGREES

Philosophy ........................................ M.A., Ph.D.

John Hardwig, Head

Professors:

Aquila, Richard E., Ph.D. .......... Northwestern
Arnold, Denis G., Ph.D. ............... Minnesota
Cohen, Sheldon M., Ph.D. .......... Northwestern
Graber, Glenn C., Ph.D. .......... Michigan
Hardwig, John, Ph.D. .......... Texas
Nolt, John E., Ph.D. .......... Ohio State
Postow, Betsy C., 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 thesis are 30 hours, including 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. This is 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.

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.

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 Philosophical Research (3) Paper workshop (writing, revising papers, getting papers ready to publish). Does not count toward hours required for degree. May be repeated. S/NC only.

520 Topics in Ancient or Medieval Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

522 Topics in Modern Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

524 Topics in Twentieth-Century Philosophy (3) Intensive critical work on themes in late 20th-century philosophy. May be repeated. Maximum 9 hrs.

528 Topics in Contemporary Philosophy (3) Intensive critical work on themes in late 20th-century philosophy. May be repeated. Maximum 9 hrs.

540 Topics in Ethics or Value Theory (3) May be repeated. Maximum 9 hrs.

542 Topics in History of Ethics (3) Dominate movements in history of ethics. May be repeated. Maximum 9 hrs.

544 Topics in Applied Ethics (3) Single author, tradition, or topic in ethical theory, application to issues in health, business, technology, ecology, and other practical fields. May be repeated. Maximum 9 hrs.

546 Orientation to Medical Ethics (3) Survey of ethical theories in application to issues in medical ethics.

547 Ethical Issues in Mental Health (3) Values in “mental health” and “mental illness,” informed consent in psychiatry, competence, patients’ rights, involuntary hospitalization and treatment, and behavior control therapies.

548 M.A. Clinical Practicum (3) Series of clinical rotations at one or more local health care institutions. Open only to graduate students concentrating in medical ethics. Prereq: 544 and consent of Medical Ethics Committee and the UTMC Graduate Education Committee.

575 Topics in Metaphysics and Epistemology (3) May be repeated. Maximum 9 hrs.

577 Topics in Philosophy of Mind (3) Relation of mental to physical and of role of words in discourse for mental activities, thinking and feeling. May be repeated. Maximum 9 hrs.

585 Special Topics (3) May be repeated. Maximum 9 hrs.

587 Advanced Clinical Medical Ethics (3) Critical concepts in medical ethics, relationship of theory to practice, and professional roles and responsibilities for health care ethics consultant. Open only to Ph.D. students concentrating in medical ethics. Prereq: Consent of Medical Ethics Committee.

588 Ph.D. Clinical Practicum (9) Series of clinical rotations at one or more medical health care institutions. Open only to Ph.D. students concentrating in medical ethics. Prereq: 587 and consent of Medical Ethics Committee.

590 Topics in Social and Political Philosophy (3) Philosophical problems concerning social and political life: family, state, freedom, justice; major theoretical responses: anarchism, social contract, Marxism. May be repeated. Maximum 9 hrs.

591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.
600 Doctoral Research and Dissertation (3-15) P/ NP only.
620 Topics in Ancient or Medieval Philosophy (3) May be repeated. Maximum 9 hrs.
622 Topics in Modern Philosophy (3) May be repeated. Maximum 9 hrs.
624 Topics in Contemporary Philosophy (3) May be repeated. Maximum 9 hrs.
640 Topics in Ethics or Value Theory (3) May be repeated. Maximum 9 hrs.
646 Topics in Applied Ethics (3) Prereq: Consent of Medical Ethics Committee. May be repeated. Maximum 9 hrs.

Physics and Astronomy
(College of Arts and Sciences)

MAJOR DEGREES
Physics ................................. M.S., Ph.D.

Soren Sorensen, Head

Professors:
Barnes, F. E., Ph.D. ...................... California
Breinig, M., Ph.D. ............................ Oregon
Callcott, T. A., Ph.D. ........................ Purdue
Blass, W. E., Ph.D. ...................... Michigan State
Breinig, M., Ph.D. ............................ Oregon
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
Eston, S. B., Ph.D. .......................... Massachusetts
Georgiou, S., Ph.D. ....................... Manchester
Greene, G. L., Ph.D. ........................ Harvard
Guidry, M. W., Ph.D. ........................... Tennessee
Hendler, T., Ph.D. ............................ Rutgers
Kamyshkov, I., Ph.D. ............................. ITEP (Russia)
Lewis, J. W. L. (Distinguished Professor) (UTSI), Ph.D. ...... Mississippi
Macek, J. (Distinguished Scientist), Ph.D. ...... Rensselaer
Nazarewicz, 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 Johnson 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
Thompson, J. R., Ph.D. ..................... Duke
Ward, B. F. L., Ph.D. ............................ Princeton
Weitinger, H. H., Ph.D. ................. Groningen (Netherlands)

Associate Professors:
Dai, P., Ph.D. ............................ Missouri
Davis, L. (UTSI), Ph.D. ............... Auckland
Efremenko, Y. Y., Ph.D. .............. ITEP(Russia)
Levin, J. C., Ph.D. ........................ Oregon
Mandrus, D. G., Ph.D. ................ SUNY (Stony Brook)
Pangerc, 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:
Barzykin, V., Ph.D. ....................... Illinois-Urbana, Champaigne
Dean, D. J., Ph.D. ............................ Vanderbilt
Spanier, S.M., Ph.D. ....................... Mainz

Research Professors:
Pinnaduwardge, L. A., Ph.D. .......... Pittsburgh
Strayer, M. R., Ph.D. ................. MIT
Zhang, J. Y., Ph.D. ........................ Lanzhou

Research Associate Professor:
Datko, P. E., Ph.D. ........................ Tennessee

Research Assistant Professors:
Sanders, A. J., Ph.D. ..................... Tufts
Yost, S. A., Ph.D. ............................ Princeton

Lecturer:
Daunt, S. J., Ph.D. ........................ Queens

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 courses prerequisite to graduate study.

A student who intends to present Physics as a graduate minor will have completed an undergraduate minor in Physics or its equivalent. Physics 311 and 431-32 constitute the minimum coursework prerequisite to a minor in Physics.

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, 571-72, 573. 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, 521-522, 531-32, 541-42, 571-72, 573; 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, 573 (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 thePhysics 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, 571-72, 573; 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 611-12 for students concentrating in theoretical elementary particle physics); Physics 615-16 of students in astrophysics and cosmology; and Physics 671-72 of students in condensed matter and surfaces 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, d) complete a research proposal, 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 mature command 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 format of the examination 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. Topical and interdisciplinary, consideration of quasars, pulsars, black holes and current developments in field. Acceptable for major credit in physics. Prereq: Physics 136 Introduction to Physics for Physical Science and Mathematics Majors, or 138 Honors Fundamentals of Physics for Physics Majors, or 222 Elements of Physics, or 222 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.

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 theory of laser, photon coherence, mode-locking and frequency stabilization; specific laser types: semiconductor and solid-state, excimer, copper vapor and dye lasers.

511-12 Theoretical Physics (3,3) Concepts and applications in applied physics. Topics: one-body, two-body and rigid body dynamics, ideal fluid, small oscillations, waves, electromagnetism, applied quantum mechanics, quantum and statistical mechanics, computer simulation techniques, statistical complexity and information theory, special relativity, general relativity and black holes, quantum chaos, quantum information, and quantum cryptography.

521-22 Quantum Mechanics (3,3) Fundamentals of quantum mechanics and applications. Prereq: Physics 615-16 or equivalent. Fundamental principles of quantum mechanics and applications. Prereq: Physics 615-16 or equivalent.

561 The Theory of Relativity (3) Fundamental aspects of special and general relativity. Topics may vary according to interest of students and instructor. Prereq or coreq for 541: 571.

571-72 Mathematical Methods in Physics (3,3) Linear vector spaces, matrices, tensors, curvilinear coordinates, and applications of matrix algebra to differential equations; partial differential equations and boundary value problems, Green's functions, integral transforms, integral equations, spherical harmonics, Bessel functions, calculus of variations. Prereq: Advanced calculus and differential equations. Must be taken in sequence. (Same as Mathematics 517-18.)

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.


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

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 spectroscopy of atomic 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, summ-frequency and difference frequency generation, harmonic generation, parametric amplification and oscillation, stimulated Raman processes, two- and multi-photon processes, four-wave mixing and phase conjugation, transient effects, and generation of optical frequency and difference frequency generation, harmonic generation, parametric amplification and oscillation, stimulated Raman processes, two- and multi-photon processes, four-wave mixing and phase conjugation, transient effects, and generation of optical frequencies.

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, Lamb shift, anomalous magnetic moments, gauge theories, electroweak theory, quantum chromodynamics, grand unified theories, and advanced topics in laser physics and quantum optics. Topics vary according to interest of students, instructor and present state of physics. Prereq: 611 or consent of instructor.

615-616 Astrophysics and Cosmology (3.3) 615—Stellar evolution: hydrostatic equilibrium, energy production and transport, star birth, main sequence, red giants, variable stars, and stellar explosions. General relativity and gravitation, white dwarfs, neutron stars, pulsars, and black holes. 616—Galaxies and the interstellar medium. Active galaxies, quasars, and supermassive black holes. Large-scale structure, the expanding Universe, cosmologies, big bang, cosmic background radiation, inflation, dark matter, formation of structure, and fate of the Universe. The Planck scale 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 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. Interaction of beams. May be repeated 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 molecular 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: 521, 531, 571.

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.

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Plant Sciences

(College of Agricultural Sciences and Natural Resources)

MAJORS DEGREES

Plant Sciences and Landscape Systems ...................... M.S.

Plants, Soils, and Insects ................................. Ph.D.

5. Neil Rhodes, Jr., Head

Professors:

Albrecht, Mary L., Ph.D. ......................... Ohio State

Allen, Fred L., Ph.D. .............................. Minnesota

Auge, Robert M., Ph.D. ...... Washington State

Deyton, Dennis E., Ph.D. NC State

Lockwood, David W., Ph.D. .......... Georgia

McDaniel, Gary L., Ph.D. ........................ Iowa State

Miller, Robert D., Ph.D. ................. Kentucky

Mullins, Charles A., Ph.D. ........ Tennessee

Rhodes, G. Neil, Jr., Ph.D. .......... NC State

Samples, Tom J., Ph.D. .......... Oklahoma State

Sams, Carl E., Ph.D. ......................... Michigan State

Stewart, C. Neal (Rachef Chair), Ph.D. ......................... Virginia Tech

West, Dennis R., Ph.D. ........................ Nebraska

Associate Professors:

Bates, Gary E., Ph.D. .......................... Georgia

Cheng, Z. Max, Ph.D. ..................... Cornell

Guthwehr, C. Owen, Ph.D. ....... California (Davis)

Hamilton, Susan L., Ed.D. ............. Tennessee

Menendez, Gary L., M.S. .......... Tennessee

Mueller, Thomas O., Ph.D. .......... Georgia

Rogers, Sam M., M.L.A. ............. Georgia

Wyatt, Jim E., Ph.D. .................... Florida

Assistant Professors:

Garton, Stephen Ph.D. ................. Minnesota

Klingeman, Bill E., Ph.D. .......... Georgia

Pantalone, Vincent, R., Ph.D. ........ NC State

Robinson, Darren K., Ph.D. .......... NC State

Sorochan, John, Ph.D. ............ Michigan State

Straw, R. Allen, Ph.D. ............. Tennessee

Emeriti Faculty:

Coffey, David L., Ph.D. .............. Purdue

Insects (PSI). For additional information, please visit our departmental homepage at http://plsl.ag.utk.edu. Inquiries may be directed to the Chair, Graduate Committee, Department of Plant Sciences, The University of Tennessee, Knoxville, Tennessee 37996-4561, or uthort@utk.edu.

THE MASTER’S PROGRAM

Both thesis and non-thesis options are available for the major in Plant Sciences and Landscape Sciences, each guided by a graduate committee consisting of the major professor and two or more other faculty members. Studies are possible in a wide variety of commodities and subject areas, including fruits, vegetables, weeds, cereals, grains, turfgrass, woody ornamentals, and public horticulture. Students may specialize in one or more disciplines, including plant protection, molecular biology, breeding, genetics, biotechnology, physiology, ecology, culture, and management.

Admission Requirements

Students should have a Bachelor’s degree from an accredited college or university, with evidence of ability to do work of graduate quality. Applicants are expected to have a minimum cumulative grade-point average of 2.7 on a 4.0 scale.

Application must be made to both the Office of Graduate Admissions and the PLSL department. The departmental application requires three letters of reference (or three Graduate Rating Forms) from persons capable of assessing the applicant’s suitability for graduate work in plant science, resume, and a statement of professional goals and reasons for applying to the program. Applicants are also required to submit scores from the general Graduate Record Examination (GRE) to Graduate Admissions (please send photocopy to department). Successful applicants will usually have a composite score on the verbal, mathematical and analytical sections of the GRE of at least 1400. Prior undergraduate course work in mathematics, biology and chemistry is recommended.

Degree Requirements

1. Approval of the academic program by the master’s committee.

2. Successful completion of 12 hours of course work in the major at the graduate level (400 or above), exclusive of Plant Sciences and Landscape Sciences 500, 502, and 503. Two of these hours must be Plant Sciences and Landscape Sciences 504. Six of these hours may be satisfied by Botany 404, 412, 521, 522, Animal Science 571, Environmental and Soil Sciences 434, 444, 516, Ecology and Evolutionary Biology 431, 520, 560, Information Sciences 560, Art 481, or Geography 459.

3. Presentation of at least two departmental seminars.

Please see the Degree Program Requirements/Master’s Degrees section at the front of this catalog for additional information.

Thesis Option:

1. Satisfactory preparation of a written thesis proposal and its oral defense to the student’s committee.
2. Successful completion of 30 hours of graduate credit, which must include 6 hours of 500. At least 14 of these hours must be numbered 501 or above.


Non-Thesis Option:

1. Successful completion of 34 hours of graduate credit, which must include 2-4 hours of PSLS 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 course work.

THE DOCTORAL PROGRAM

A Ph.D. in Plants, Soils and Insects (PSI), with concentrations in horticulture, crop sciences, weed biology and plant improvement, is offered under a multi-departmental doctoral program. Three departments participate: Plant Sciences, Entomology and Plant Pathology, and the soils faculty in Biosystems Engineering and Environmental Sciences. Other concentrations within the PSI major include integrated pest management and bioactive natural products. Please see the Plant Sciences homepage for additional information, http://psls.ag.utk.edu/, or contact a faculty member in the area of interest.

Students may select a formal concentration as a focus of study but this is not a requirement. We recognize that modern research approaches in plant sciences often overlap. Students may specialize in one or more areas, including plant biotechnology, molecular biology, breeding, genetics, physiology, ecology, culture and management. Research may feature fruits, vegetables, turfgrass, weeds, woody ornamentals, cereals, grains, fiber, public horticulture or model plant systems.

Admission Requirements

Submit application, fee, official transcripts, and scores from the general portion of the Graduate Record Examination to the Graduate Admissions Office. In your application, indicate that you are applying to the Plants, Soils and Insects doctoral program. Submit resume, three letters of reference (or three Graduate Rating Forms), photocopy of GRE scores and a short statement of professional goals and reasons for applying to the Ph.D. Program Coordination Unit, Department of Plant Sciences, 2431 Center Drive, 252 PSB, University of Tennessee, Knoxville, Tennessee, 37996-4561. In your statement letter and application, please indicate your concentration of interest and intended major professor.

Degree Requirements

To obtain the doctorate, the student must meet the following requirements:

1. The student and the major professor will select a minimum of three additional faculty, holding at least rank of assistant professor or above, to serve on the student's doctoral committee. The major professor and two committee members must be approved to direct doctoral research by the Graduate Council, and at least half of the committee must hold teaching appointments. At least one member of the committee must be from outside the department. The doctoral committee must be formalized by the end of the second semester of graduate study.

2. Subsequent program of study by the end of the second semester of graduate study. A candidate for the doctoral degree must complete a minimum of 24 hours of graduate coursework numbered 503 or higher beyond the master’s degree. Candidates must have a minimum grade of B- in each course. The candidate must meet the following requirements:

3. Satisfactory preparation of a written dissertation proposal and its oral defense to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 600. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.

4. Satisfactory completion of 48 hours of graduate coursework beyond the baccalaureate degree, 24 hours of which must be numbered 503 or higher. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. At least 9 hours of the student’s coursework must be from outside the PSI major, and a minimum of 6 semester hours must be taken in UT courses numbered 601 or higher. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.

5. Satisfaction of all degree requirements.


Please see the Degree Program Requirements/Doctoral Degrees section at the front of this catalog for additional information.

Plant Sciences and Landscape Systems

GRADUATE COURSES


427 Management and Administration of Public Horticulture Institutions (3) Management of resources in non-profit institutions, support organizations and communities. Theoretical framework and institutional mission; strategic planning and programing; financial accounting and budgeting; development of fund raising; personnel policies; volunteer development; marketing and publicity; legal issues; relationships between state and local boards; the use of information technology in management and government systems; and conservation/preservation/preservation of community development. Prereq: 326 Public Horticulture.

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.

480 Advanced Landscape Design (3) Comprehensive application of landscape design skills to variety of project experiences: landscape planning and analysis, planting design, and materials estimating. Prereq: 280 Fundamentals of Landscape Design and 380 Supplemental Landscape Design Graphics. 2-3 hr labs.


494 Professional Horticultural Communications (3) Communication for public horticulturists through written, oral and visual media. Communication skills using proper writing techniques and grammar for print media, brochure design using desktop publishing, slide show development, oral presentations, and video use for educational presentations in ornamental horticulture. Prereq: Agriculture and Natural Resources 290 Computer Applications to Problem Solving and senior standing.

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

501 Special Topics in Plant Sciences (1-3) Topics to be assigned. May be repeated. Maximum 6 hrs. Prereq: Consent of instructor.

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.

503 Non-Thesis Project (1-2) Library, field or laboratory project under supervision of faculty member. Not for thesis candidates. May be repeated. Maximum 4 hrs.

504 Seminar (1) Presentations and discussion of topics. May be repeated. Maximum 2 hrs.

505 Seminar Preparation (1) Application of speaking, writing, and organizational skills in preparation and presentation of scientific material to both scientific and general audiences. Preparation of abstracts for scientific presentations. Required of all entering graduate students during their first year of graduate study. (Same as Environmental and Soil Sciences 501.)

507 Professional Development Seminar (1) Same as Agriculture and Natural Resources 507, Agricultural Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Food Science and Technology 507, S/NC only.

510 Plant Disease Fungi (4) (Same as Entomology and Plant Pathology 510.)

521 Flowering Physiology (1) General phenomenology, photoperiodism, thermoecraphy, interaction of external factors, juvenility, and hormonal regulation. Prereq: Introductory Plant Physiology or equivalent. 3 hrs weekly for 5 weeks.

522 Drought Physiology (1) Biophysical and biochemical aspects of plant water relations and drought physiology. Prereq: Introductory Plant Physiology or equivalent. 3 hrs weekly for five weeks.

530 Integrated Pest Management (3) (Same as Agriculture and Natural Resources 530.)


536 Ecology of Grazing Land Systems (3) Multi-university, field-oriented course. Components and functions of grazing lands and how these vary in different ecoregions; research needs, objectives, and techniques in soil-plant-animal research; forage- livestock ecology and systems in grazing lands (cropland, pastureland, rangeland and forestland); role of forages in conservation practices, wildlife habitats, and sustainable agriculture; and industries involved with forages and livestock. Two-week field trip, inclusive report and examination. Prereq: Consent of instructor.

543 DNA Analysis (2) (Same as Entomology and Plant Pathology 543.)

544 Protein Gel Electrophoresis (1) (Same as Entomology and Plant Pathology 544.)

545 Plant Microtechnique (1) (Same as Entomology and Plant Pathology 545.)

551 Organismal Plant Genetics (3) Discovery of genetics, polyploidy, extrachromosomal inheritance, apomixis, incompatibility systems, mutations, control elements, quantitative inheritance and heritability. Prereq: General genetics, Plant Sciences and Landscape Systems 471 or equivalent.

571 Design and Analysis of Biological Research (3) (Same as Animal Science 571.)

592 Internship (1-2) Application of horticulture and design principles and management technicals in a professional setting, approved by department. S/NC or letter grade.

593 Problems in Plant Sciences (1-3) Independent study. Current topic related to technology, science or design. May be repeated. Maximum 6 hrs.

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

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. Interactions 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.

605 Special Topics in Plant Breeding and Genetics (1-3) Genotype by environment interactions, linkage, screening methods, genome organization. May be repeated. Maximum 6 hrs.

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 521 or 522 and organic chemistry or biochemistry.

653 Advanced Plant Breeding (3) Principles and methodologies targeting genetic gain for crop improvement. Concepts of qualitative and quantitative trait improvement. Parental germplasm, hybridization, population formation, inbreeding, genetic variance, heritability, selection methods, molecular genetic markers, genetically engineered crops. Prereq: 571 and general genetics, or equivalent, or consent of instructor.

Political Science

(Majors in 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
Schein, John M., II, Ph.D. .......... Florida
Smith, T. Alexander, Ph.D. ......... Ohio State
Stephens, Otis H. (Distinguished Professor), Ph.D. .... Johns Hopkins

Associate Professors:
Foil, 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:
Caprio, Mary, Ph.D. ................... Connecticut
Carcieri, 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 departmental 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 on coursework and the thesis, is required. At least 12 of these hours must be in political science, with 6 in the field of methodology (Political Science 510 and either 511 or 512); 6 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, a general average of 3.0 and an advanced score of at least 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 Resources 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.

3. Recommended Internship (6 hours)

Internships are arranged in consultation with the coordinator of the M.P.A. degree program.

4. Final Examination

A written final examination, which may be followed by an oral examination, is required.

DUAL J.D.-M.P.A. PROGRAM

The College of Law and the Department of Political Science offer a coordinated dual degree program leading to the conferred 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 student may earn the M.P.A. and J.D. Administration degrees. In this program, a Doctor of Jurisprudence and Master of Public Sciences offer a coordinated dual degree program 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. coordinators in both academic units. In the third and fourth years, students are strongly encouraged to take both law and political science courses each semester.

Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

Awarding of Grades

For grade recording purposes in the College of Law and the Department of Political Science, grades awarded in courses in the other unit will be converted to either Satisfactory or No Credit and will not be computed in determining a student’s GPA or classes standing. The College of Law will award a grade of Satisfactory for an approved M.P.A. course in which the student earns a grade of B or higher and a grade of No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of 2.5 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 (GRE).

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 of the five 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.)
520 Political Theory (3) Survey of major ideas, thinkers and works of Western political theory.

522 American Political Thought (3) Systematic examination of the normative 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 structures, 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 and models of the 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 analysis of government, politics, coalitions, 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.

549 Environmental Policy (3) Overview of contemporary environmental policy and its evolution. Examines the roles of values in the environmental arena. Provides a framework for policy analysis and analytical tools for selection and choosing among policy options.

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 service.

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 dealing with political systems of less developed countries. May be repeated with consent of department. Maximum 9 hrs.

572 The Politics of Development (3) Selected topics in modern governments. 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) Institutional 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 (1-5) 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 of MPA students in use of software applications for personal computer. S/NC only.

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

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 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 decision: 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.
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 Thesis 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 Ph.D. program in Psychology with a concentration in experimental psychology is designed to allow students to select from a variety of specializations oriented toward careers in research, teaching, and application of psychology in academic, institutional, or industrial settings. The program is flexible, individualized, and emphasizes a professional apprenticeship model of training.

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. This examination is comprised of an integrative review or theoretical paper and an oral exam or additional questions.
9. Twenty-four hours of dissertation research (600).
10. An original piece of research in the form of a doctoral dissertation, proposed, conducted, and defended.

Clinical Psychology

This program is designed to lay the groundwork for a career as a clinical psychologist capable of working in both academic and applied settings. The program emphasizes the theoretical foundations of psychology as well as supervised experience oriented toward the development of practical skills. The program embodies a model of clinical psychology in which practice and research are integrated.

Clinical program students must complete a predissertation research project by the end of the second year. Before forming the doctoral committee, each student must pass a comprehensive examination administered and evaluated by an advisory committee. The comprehensive examination is organized around a research case study of one client who has been assessed and/or treated by the student in the departmental psychological clinic. In addition to the case presentation, the paper presents the student's comprehensive review of relevant research and theory as a context for procedure, results, and discussion of the case. 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);
Psychology

b. Interviewing and Observation (558) and Laboratory (559);
c. Research Practicum (509) (4 hrs.);
d. Life-Span Development (512) or Developmental Psychology (511);
e. Personality: Theory and Research I and II (570-71);
f. History and Systems of Psychology (565);
g. Research Questions and Designs (580);
h. Psychological Assessment I and II (594-95) and Laboratory (596);
i. Analysis of Variance for Social Sciences (521) and Multiple Regression for Social Sciences (522);
j. Social Psychology (550);
k. Field Placement in Clinical Psychology (695) (18 hrs.);
l. Dynamics of Psychopathology (573);
m. Psychometrics (555) or Applied Psychological Measurement (557);

5. Students who choose a teaching assistantship in the third or fourth year must have satisfactorily completed 528 College Teaching in Psychology.

6. Satisfactory completion of a one-year clinical internship at a site approved by the program.

Counseling Psychology

The Counseling Psychology program is based upon the scientist-practitioner model of training which stresses both research and practice. It is designed to enable students to become behavioral scientists, skilled in psychological research and its application. Students are trained to work with people who have generally integrated or intact personalities, to focus on these individuals' strengths and assets, and to use relatively brief interventions to further enhance these strengths or to remediate deficiencies within them. While working with others, counseling psychologists tend to focus on the interactions of the personal, educational and vocational environments of the individuals, groups, families and organizations with whom they work.

The Counseling Psychology program consists of a minimum of 107 semester hours of graduate credit. This includes 83 hours of course work and 24 hours of dissertation research (see below).

Students are assigned a temporary faculty advisor upon admission to the program. By the end of the first calendar year students are expected to have selected an advisory committee. Prior to taking their comprehensive examinations, students must have an advisory committee meeting, present an acceptable program of study to the advisory committee, and have their research competency approved and accepted by the program's research review committee. The examinations cover the counseling psychology core and the student's cognate.

After passing comprehensive examinations, the student may form the doctoral committee, which approves the student's dissertation proposal and verifies that the student's dissertation is acceptable for the doctoral degree. The doctoral dissertation is original research that is theoretically based and psychological in nature. It must fulfill the requirements and procedures of the University of Tennessee Graduate Catalog, current edition.

The following are required of all students:
1. Students must accumulate a minimum of 60 hours in practicum experience. Students are required to have three semesters of individual practicum and one semester of group practicum. Practicum sites include the University of Tennessee Counseling Center, community agencies, the UT Career Resources Center, and area schools. Opportunities for additional practicum experiences exist in the community.
2. In addition to course work, students must demonstrate competency in research methodology and academic scholarship prior to the doctoral committee's approval of the student's dissertation proposal. The research project is to be initiated after the student has entered the Counseling Psychology program.
3. Satisfactory completion of the following curriculum:

A. P. Psychological Foundations—minimum of 21 semester hours
1. History and Systems of Psychology
2. Biological Bases of Behavior
3. Cognitive-Affective Bases of Behavior
4. Social Basis of Behavior
5. Individual Behavior—minimum of six semester hours
6. Life Span or Developmental Psychology
7. Quantitative and Research Skills—minimum of 15 semester hours
1. Statistics—minimum of six hours
2. Qualitative Research—minimum of three hours
3. Research Design—minimum of three hours
4. Directed Research
5. Counseling Psychology Core—minimum of 39 semester hours
1. Practicum in Career Development
2. Vocational Theory and Practice
3. Practicum—minimum of 9 semester hours
4. Foundations of Counseling Psychology—minimum of 6 semester hours
5. Cross-cultural Counseling
6. Legal and Professional Issues in Psychology
7. Assessment—minimum of 6 semester hours
8. Group Counseling
9. Supervision on
D. Departmental Seminar
4. Students are also required to complete a 2000-hour internship prior to graduation. In consultation with the student and the student's doctoral committee chair, the Training Director approves the internship site, which must meet APA Guidelines.
5. Students who wish to have experiences as a teaching assistant must first satisfactorily complete department's teaching practicum course.

GRADUATE COURSES


409 Group Facilitation (3) Study of theory and technique through supervised experience in small groups. Prereq: General Psychology or consent of instructor. May be repeated. Maximum 6 hrs.

410 Sensory Processes and Perception (3) Survey of physiological and psychological theories of perception. Audition and vision. Prereq: General Psychology or consent of instructor, Statistics in Psychology or Statistical Reasoning or Introduction to Statistics or graduate standing.

415 Psychology of Religion (3) History of psychology of religion: various philosophical and empirical orientations. Psychological function of religion for individuals and society. Prereq: General Psychology or consent of instructor.

420 History and Systems of Psychology (3) History of psychological thought. Classical approaches and recent developments. Prereq: General Psychology or consent of instructor or graduate standing.

424 Psychology and the Law (3) Psychological aspects of legal systems. Prereq: General Psychology or consent of instructor.

430 Health Psychology (3) Survey of psychological factors related to health and illness: stress, personality, and environment. Applications of psychological treatments to physical illness. Prereq: General Psychology or consent of instructor.

434 Psychology of Gender (3) Biological, psychological, and social factors in gender. Importance of gender roles and stereotypes for behavior and experience. Prereq: General Psychology or consent of instructor. (Same as Women's Studies 434.)

440 Organizational Psychology (3) Social-psychological analysis of organizational role theory and systems theory. Prereq: General Psychology and Social Psychology or consent of instructor.


450 Comparative Animal Behavior (3) (Same as Ecology and Evolutionary Biology 450.)

459 Comparative Animal Behavior Laboratory (3) Coreq: 450. (Same as Ecology and Evolutionary Biology 459.)

461 Physiological Psychology (3) Nervous system and physiological correlates of behavior. Biological basis of emotion, learning, memory and stress. Prereq: General Psychology or consent of instructor and either Biodiversity and Organization and Function of the Cell, or Human Origins and Principles of Biological Anthropology.

470 Theories of Personality (3) Survey of major theories of human personality and their development. Prereq: General Psychology or consent of instructor.

475 Adolescent Development (3) Theoretical perspectives and empirical research findings pertinent to adolescent development. Prereq: General Psychology or consent of instructor.

480 Theories of Learning (3) Classical and current approaches to learning and cognition. Prereq: General Psychology or consent of instructor.

482 Topics in Psychology (3) Intensive analysis of special topics: Afro-American psychology or evaluation of programs in community. Prereq: General Psychology or consent of instructor. May be repeated. Maximum 6 hrs.

489 Supervised Research (1-9) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs in 489, 489H, 491, 491H, 492, and 493 combined may apply toward undergraduate major.

500 Thesis (1-15) P/NP 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 when degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only.
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.

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.

509 Research Practicum (1-3) Required of first-year graduate students in psychology. May be repeated. Maximum 9 hrs. S/NC only.

510 Topics in Psychology (3) Intensive examination of selected issues in psychology. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

511 Developmental Psychology (3) Normal processes of human socialization, physical, cognitive, and emotional development from conception through infancy, childhood, and adolescence. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

512 Life-Span Development (3) Theories and research concerning normal human development throughout life, adulthood and old age. Prereq: Consent of instructor.

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.

517 Foundations of Counseling Psychology (3) History, theory, research and practice of counseling psychology. May be repeated. Maximum 6 hrs.

521 Analysis of Variance for Social Sciences (3) Analysis of variance and statistical theory: application within social science framework. Contrasts among means, trend analysis, analysis of covariance, analysis of factorial designs, and multivariate approaches to analysis of within subjects data.

522 Multiple Regression for Social Sciences (3) Completeness of multiple regression analysis and application within social science framework. Bivariate correlation and regression, multiple regression, analysis of variance, interactions among continuous predictors and levels of fixed predictors, complexity between main effects and interaction of multiple regression to testing procedures of mediation and moderation.

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.


531 Personality and Mental Hygiene (3) Mental health perspectives and their application to social institutions.

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. (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.

554 Laboratory in Psychometrics (3) Further learning about psychometric 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 Psychometric Statistics 537-538 or equivalent. May be repeated. Maximum 6 hrs.

557 Applied Psychological Measurement (3) Issues and techniques in applying psychological measurement in organizational, clinical, and community research. Prereq: Statistics 537-538 or equivalent or consent of instructor. 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 psychological 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: 400 and consent of instructor. May be repeated. Maximum 6 hrs.

565 History and Systems of Psychology (3) History of philosophy concerning psychology. Major systems of psychology which emerged during 20th century. Prereq: Graduate students only. May be repeated. Maximum 6 hrs.

567 Group Dynamics and Methods (3) (Same as COIN 554.)

568 Prepractice in Career Development (3) Didactic instruction and practice in counseling and career exploration. Prereq: Admission to doctoral program in Counseling Psychology.

569 Practicum in Counseling (3) (Same as COIN 555.)

570 Personology: 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.

571 Personology: Theory and Research II (3) Advanced survey of humanistic and social psychological approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor.

572 Individual Cognitive Assessment in Counseling (3) Basic concepts and applications in individual assessment of intelligence; proficiency in administrative scoring, interpretation for Wechsler, adults and children, Stanford-Binet, Prereq: 445; COIN 525 or equivalent. Satisfactory/No Credit grading only.

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.

574 Cross-Cultural Counseling: Theory and Research (3) (Same as COIN 570)

575 Psychopharmacology (3) Connections between pharmacology and psychology. Prereq: Consent of instructor.

576 Object Relations (3) European and American conceptions of mental life; psychodynamic 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.

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.

596 Laboratory in Psychological Assessment (1) Prereq: Admission to doctoral program in clinical psychology or related research and conceptual analysis. Coreq: 584 or 585. May be repeated. Maximum 4 hrs. S/NC only.

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

601 Seminar in Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.


610 Seminar in Applied Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

613 Seminar in Existential-Phenomenological Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.


623 Seminar in Methods of Naturalistic Research (3) Prereq: 546 or consent of instructor. May be repeated. Maximum 12 hrs.

625 Advanced Study in Personality (3) Theory, research and conceptual analysis. Coreq: 584 or consent of application to education and counseling. Prereq: 470 or equivalent. (Same as COIN 625.)

635 Ethical, Legal, and Professional Issues in Psychology (3) Research, human services, teaching and publishing. 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.

661 Education Implications of Neuropsychology (1) Theorists and practitioners assess behavioral syndromes and their behavioral and cognitive manifestations. Prereq: 461 or consent of instructor.

667 Personality and Vocational Assessment (3) Use and interpretation of personality and vocational measures in assessment of clients. Prereq: 445 or 504 or COIN 525 or consent of instructor. (Same as COIN 671.)

670 Psychotherapy I (3) Theories and principles. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 400 or equivalent. Prereq: 596 or consent of instructor.

671 Psychotherapy II (3) Theories and principles. Prereq: Admission to doctoral program in clinical psychology and 670 or consent of instructor.

672 Psychological Dysfunction (3) Classification methods, dynamics and treatment of dysfunctional individuals in counseling. Prereq: 425 and a course in abnormal psychology, or consent of instructor.

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 135 clock hrs required each semester. Prereq: Admission to doctoral program in Counseling Psychology, 445 or equivalent, 569 and consent of instructor. May be repeated. Maximum 6 hrs.

674 Practicum in Counseling Psychology (3) Supervised practice of individual counseling. Minimum 135 clock hrs required each semester. Prereq: Admission to doctoral program in Counseling Psychology, 445 or equivalent, 569 and consent of instructor. May be repeated. Maximum 6 hrs.
675 Advanced Theory and Practice in Group Counseling (3) Theories and supervised practice. Prerequisite: 567 and consent of instructor.

676 Field Placement in Counseling Psychology (3) Prerequisite: 674 and admission to the doctoral program in counseling psychology. May be repeated. Maximum 12 hrs. Satisfactory/No Credit grading only.

678 Theory and Practice of Counseling Supervision (3) Theory and practice of supervision in counseling. Prerequisite: 674 or consent of instructor. Satisfactory/No Credit grading only.

679 Internship in Counseling Psychology (1-6) Supervised employment in departmentally approved counseling psychology internship sites. Prerequisite: Admission to counseling psychology doctoral program and consent of instructor. May be repeated. Maximum 12 hrs. Satisfactory/No Credit grading only.

683 Seminar in Behavioral Medicine (3) Current research and theory concerning relationships between behavior and health. Prerequisite: Consent of instructor. May be repeated. Maximum 12 hrs.

695 Field Placement in Clinical Psychology (3) Prerequisite: Admission to doctoral program in clinical psychology and consent of instructor. May be repeated. Maximum 24 hrs. S/NC only.

696 Advanced Psychology Clinic Placement (1-3) Prerequisite: Admission to doctoral program in clinical psychology or consent of instructor. May be repeated. Maximum 24 hrs. S/NC only.


Religious Studies

(College of Arts and Sciences)

Gilya G. Schmidt, Head

Professors:

Dungan, David L., Th.D. .......... Harvard
Fitzgerald, James L., Ph.D. .......... Chicago
Hackett, Rosalind J. I., Ph.D. ...... Aberdeen
Levering, Miriam L., Ph.D. .......... Harvard
Reynolds, Charles H., Ph.D. ........ Harvard
Schmidt, Gilya G., Ph.D. .......... Pittsburgh

Associate Professors:

Gwynne, Rosalind W., Ph.D. ......... Washington
Hodges, John O., Ph.D. ............. Chicago
Hulseher, Mark, Ph.D. ............... Minnesota

Assistant Professors:

Jacobs, Rachelle M., Ph.D. .......... Northwestern
Stiebert, Johanna, Ph.D. .......... Glasgow

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. Prerequisite: 374 or 376 or consent of instructor.

425 Seminar in Western Religions (3) Selected figures, themes, movements, and problems. Content varies. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.

430 Seminar in American Religion (3) Selected figures, themes, movements, and problems. Content varies. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.

440 Seminar in Comparative Religion (3) Selected figures, themes, movements, and problems. Content varies. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.

490 Readings and Research in Religious Studies (3) Prerequisite: 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. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.


505 Religious Texts and Contexts (3) Critical study of texts and their interpretations; sacred texts, commentaries, religious autobiographies, and religious themes in literature. 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, sacred texts, images, representations, 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) Prerequisite: Consent of instructor.

533 Topics in Religious Thought (3) Prerequisite: 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.

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. Prerequisite: 374 or 376 or consent of instructor.

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430 Seminar in American Religion (3) Selected figures, themes, movements, and problems. Content varies. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.

440 Seminar in Comparative Religion (3) Selected figures, themes, movements, and problems. Content varies. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.

490 Readings and Research in Religious Studies (3) Prerequisite: 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. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs.


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513 Religion, the Arts, and the Media (3) Material and expressive culture, religion and journalism, mass communication technologies, sacred texts, images, representations, 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.


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532 Topics in the History of Religions (3) Prerequisite: Consent of instructor.

533 Topics in Religious Thought (3) Prerequisite: 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.
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 Science subjects. Applicants must have a course in human 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. Applicants with other academic backgrounds may request consultation to discuss ways that they can meet the requirements.

2. A grade point of 2.7 or higher on a 4.0 scale. Applicants falling below this average may be considered for probationary admission on the basis of supplemental evidence of the ability to perform at a satisfactory level.

The University requires a minimum GPA of 2.7 for admission to graduate study.

3. Personal qualifications acceptable for entrance into the professional practice of social work.

4. Applicants must submit up-to-date scores from the Graduate Record Examination (general).

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 admitted into advanced standing are required to complete a minimum of 36 hours of study in either a professional concentration—clinical social work practice or social welfare 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 administered by the College is made available after admission.

General Requirements

1. The program requires successful completion of a minimum total of 60 semester hours including completion of the foundation curriculum (30 hours) and 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 presents 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 psychosocial, interpersonal problems; (2) ethically and culturally sensitive practice; and (3) influencing the development of services and programs that are responsive to the needs of vulnerable, high-risk clients and groups.

Required courses:

521 Clinical Social Work Practice with Individuals (3 hours)
525 Clinical Social Work Practice with Groups (3 hours)
526 Evaluating Clinical Practice (3 hours)
582-83 Field Practice (12 hours)

Minimum of three (total of 9 hours) advanced course electives as follows:

One or more from a pool of advanced clinical practice courses.

One or more from a pool of advanced general courses.

Social Welfare Management and Community Practice: The social welfare management and community practice concentration focuses on students’ developing skills directed toward the management and analysis of complex service delivery needs within organizations and communities, knowledge and skills in the development of service intervention strategies to address such and related needs, and the organizational and management skills that enable practitioners to work in a variety of challenging and turbulent environments. The concentration emphasizes theory and skills related to leadership and administration and permits flexibility in tailoring a program to fit the student’s individual interests, capabilities, and career goals.

Required courses:

541 Leadership and Management in Human Services (3 hours)
543 Financial Management and Resources Development (3 hours)
547 Evaluation Research (3 hours)
582-83 Field Practice (12 hours)

Minimum of three (total of 9 hours) advanced course electives as follows:

One course in advanced policy (3 hours).
Two courses from a pool of advanced general courses (6 hours).

Field Practice

Field instruction is a critical component of the student’s first- and second-year programs. Through cooperation with a wide range of social agencies and human service programs throughout Tennessee, the college is able to provide field placements in a variety of social work practice areas. The faculty works closely with the placement agencies and the field instructors to ensure 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 educational objectives.

Second-year placements are selected according to the student’s area of concentration, individual career interests, and educational needs. The student actively participates with the field practice coordinator and the educational committee in selection of the

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.

Social Work and Anthropology Program

The Social Work and Anthropology Program prepares students to provide practice experiences related to the 1) amelioration of complex psychosocial, interpersonal problems; (2) ethically 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.
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 Nashville and Memphis, 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.

Applications may be downloaded at www.csw.utk.edu/phd/.

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 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.
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 II (3, 3) Major social science theories that inform social work profession’s understanding of human behavior and interaction from ecological perspective. Interactions among biological, social, psychological, and cultural systems on development across life cycle. Concepts of individual, family, 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 professionals to formal policy-making process through which macro-social change is effected and through which aggregate social welfare services are proposed, authorized, financed, and programmed. Theories of complex organizations applied to social welfare 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. Connections 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 perspective of major family therapy models. Techniques of intervention in terms of application to families with varied system and individual problems and to families from varied social and cultural backgrounds.

524 Psychopathology and Social Deviance (3) Assessment of psycho social functioning of individuals. Examination of mental disorders: clinical presentation, causes, and processes. Ecological perspective. Prereq: Foundation or consent of instructor.

525 Clinical Social Work Practice with Groups (3) Theoretical and historical approaches to social work with groups and clinical 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 services to clients.

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 planned 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 (3) Techniques for practice modalities 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 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, and issues in practice and utilization of evaluation research as applied to development and evaluation of social work programs and policies. Issues pertaining to strengths and limitations of various evaluation methods, microcomputer application of data, and measurement of program goals and objectives.


552 Community Organization (3) Locality development, social policy, theory, techniques, and practice models 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 or management and community practice. S/NC only.

583 Field Practice (6) Instruction and supervision in clinical social work practice or management and community practice. S/NC only.

584 Field Practice (2-6) Instruction and supervision in social work practice. May be repeated. S/NC only.

585 Seminar in Gerontology (1) (Same as Counselor Education 585, Educational Psychology 585; Exercise Sciences 585, Nursing 585, Public Health 585; 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.

601 Research for Social Work Practice I (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice.

602 Research for Social Work Practice II (3) Epistemological and methodological considerations for both qualitative and quantitative research for social work practice.

604 Research in Social Service Settings (3) Advanced research, under faculty supervision, of practice issues in community agencies. Prereq: First year required Ph.D. courses or consent of instructor. May be repeated. Maximum 9 hrs.

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.
concentration includes 505, 551, 653 and 655. The Environmental Sociology 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, 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 hours in a second area, including areas outside the department, subject to the approval of the student’s committee; Plan 2, 12 hours in a special area of study approved by the student’s committee and the 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 credit). 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 Curriculum Committee. Sociology courses at the 400 level may not be taken without the consent of the student’s advisor and the Curriculum Committee. Six hours may be taken in related fields without petitioning 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 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.

GRADUATE COURSES

405 Sociology of Sport (3) Social meaning, organization, and process of sport. Prereq: 291 or consent of instructor.
414 Sociology of Health Care (3) Organization of health care facilities, staff-patient relationships, demographic characteristics, and prevalence of disease.

415 Sociology of Aging (3) How roles and statuses change with age in relation to major social institutions; impact that rapidly increasing number of older people has on society, effect of society on older people.
446 The Modern World System (3) Critical examination of capitalist world system; its coherence, boundaries, regions, member groups, cleavages, and patterns of conflict. Analysis of who gets what, why, and how in global economic system.
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, organizations 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 control 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) S/NP 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/NP only.
504 Sociological Foundations of Political Economy (3) Survey of substantive theories of political economy, sources of political and economic power and conflict.
505 Foundations of Criminology (3) Critical overview of contemporary developments in criminology, theories of crime causation and theories of responses to crime. Prereq: 350 or equivalent.
507 Foundations of Social Psychology (3) Current and classical theoretical perspectives in social psychology.
510 Teaching Sociology (3) Art and craft of teaching sociology from curricular considerations through teaching techniques. May be repeated. Maximum 6 hrs.
521 Sociological Theory I (3) Assessment of what sociological theory is; its major figures and their approaches to understanding society.
531 Research Methods in Sociology (3) Research design, measurement, sampling, quantitative and qualitative data collection techniques, data, reduction, and analysis.
534 Advanced Sociological Analysis (3) Underlying assumptions and logical procedures used by sociologists in formulating explanations; foundations of sociological research strategies and techniques.
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.
515 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.

565 Advanced Rural Sociology (3) (Same as Rural Sociology 555.)

585 Seminar in Gerontology (1) (Same as Counselor Education 585, Educational Psychology 585; Exercise Science 585; Health 585; Nursing 585; Public Health 585; Social Work 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 Readings (3) Selected topics. May be repeated. Maximum 6 hrs.

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

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 survey 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.


661 Environmental Theory (3) Systematic treatment of current research in environmental sociology. Social impact analysis and conflicts over environmental issues.

665 Advanced Studies in Environmental Sociology (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.

685 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

Sport and Leisure Studies

(College of Education, Health, and Human Sciences)

MAJORS DEGREES

Education ................................ Ph.D. Recreation and Leisure Studies .......... M.S. Sport Studies .................. M.S.

J.T. DeSensi, Head

Professors:


Assistant Professors:


Adjunct Assistant Professors:


Adjunct Instructors:

M. Brown, M.S.; E. Catignani, M.S.; D. Jennings, B. S.; D. Thomas, M.S.; K. White, B.S.

Internship Coordinator:

L. Y. Brown, M.S.

Lecturers:

S. Causey, M.S.; L. Y Brown, M.S.

Artist in Residence—Dance

P. Burke

699 Readings (3) Selected topics. May be repeated.

541 Readings (3) Selected topics. May be repeated.

545 Advanced Studies in Political Economy (3) Topical seminar covering particular lines of research and theory within area. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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.

585 Seminar in Gerontology (1) (Same as Counselor Education 585, Educational Psychology 585; Exercise Science 585; Health 585; Nursing 585; Public Health 585; Social Work 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 Readings (3) Selected topics. May be repeated. Maximum 6 hrs.

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

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 survey 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.


661 Environmental Theory (3) Systematic treatment of current research in environmental sociology. Social impact analysis and conflicts over environmental issues.

665 Advanced Studies in Environmental Sociology (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.

685 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.

Non-Thesis Option
Recreation and Leisure Studies
420 or 425, 510, 515, 520, 521, 522
Research Methods 3
Statistics 3
Internship 6
Elective 6
Total 36

Sport Studies

Sport Management
The sport management concentration provides the opportunity for students to have a quality academic experience and to gain professional experience as they prepare for careers in the sports industry.

Graduate Assistantships. Graduate assistantships are available to qualified candidates. Students should contact directly the area in which they are pursuing an assistantship. A limited number of graduate teaching assistantships are available in the Physical Education and Activity Program for sport management students. Please contact Glenda Dills at gdills@utk.edu or 865-974-1272 for more information regarding these assistantships.

THE MASTER’S PROGRAM

Project Option
SM 511 3
SM 532 3
SM 535 3
1Sport Management Electives 6
2Cultural Foundations of Sport 3
3Electives 12
SM 501 - Project 3
Total Hours 33

Thesis Option
SM 511 3
SM 532 3
SM 535 3
1Sport Management Electives 6
2Cultural Foundations of Sport 3
3Electives 6
Total Hours 30

1SM 440, 512, 530, 540, 544, 553, 554, 555, 570, 580.
2SS 507, 514, 542.
3These courses can be taken within Sport and Leisure Studies or outside the department. A total of six hours may be earned in SM 590 and SM 595 combined.

Recruitment and leisure studies
GRADUATE COURSES
415 Development and Maintenance of Recreation and Athletic Facilities (3) Principles of designing, planning, equipping, operating and maintaining various facilities. Elements of risk management and safety in design process. Prereq: 310 Development and Evaluation of Recreation and Tourism Programs or consent of instructor. (Same as Sport Management 415.)
430 Organization and Administration of Leisure Services (3) Principles of administration applied to provision of leisure services offered by public, private, and/or commercial enterprises. Organizational structures, personnel management, evaluation, legal authority, introduction to budgeting and fiscal procedures. Prereq: 310 or consent of instructor.
440 Dimensions of Commercial Recreation and Leisure Enterprises (3) Prereq: 201, junior standing or consent of instructor.
450 Special Topics in Leisure Education (1-6) Development of special topics in recreation, therapeutic recreation and leisure. May be repeated. Maximum 6 hrs.
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.
500 Thesis (1-15) P/NP 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.
540 Fiscal Policies for Recreation and Sports Related Organizations and Facilities (3) Application of fiscal policies and procedures to operation of recreation 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.
541 Management and Operation of Recreation and Sport Related Facilities (3) Research for making program and management decision, process of cost analysis, and basic design and maintenance of recreation and sport related facilities. Prereq: Consent of instructor.
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.
591 Directed Study in Leisure and Recreation (1-6) Detailed study of theme, issue, or concern. Designed to meet needs of individual students. May be repeated. Maximum 6 hrs.
592 Special Topics in Recreation and Leisure Studies (1-6) May be repeated. Maximum 6 hrs.

Sport Management
GRADUATE COURSES
415 Development and Maintenance of Recreation, Tourism and Athletic Facilities (3) (Same as Recreation and Tourism Management 415.)
**Statistics**

(College of Business Administration and Intercollegiate Program)

**MAJORS DEGREES**

Statistics .......................................................... M.S.
Business Administration ................................. Ph.D.

Robert W. Mee, Head

Professors:
Bozdogan, Hamparsum, Ph.D. .......... Illionis
Guess, Frank M., Ph.D. ........... Florida State
Mee, Robert W., Ph.D. ............... Iowa State
Parr, William C., Ph.D. .... Southern Methodist

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; Carney, 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; Huch, Schuyler, Education; James, Lawrence, Business Administration; Ladd, R. T., Business Administration; Lounsbury, John, Arts and Sciences; Lyons, William, Arts and Sciences; McLemore, Dan, Agricultural Sciences and Natural Resources; Mefford, Linda, Nursing; Miller, Mark, Communications; Orme, John, Social Work; Rajput, Balram, 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.

Emeriti Faculty:
McLean, Robert A., Ph.D. ............... Purdue
Phipot, John W., Ph.D. ............... VPI
Sanders, Richard D., Ph.D. .......... Texas
Sylwester, David L., Ph.D. .......... Stanford
Thigpen, Charles C., Ph.D. .......... VPI

**THE MASTER'S PROGRAM**

The M.S. program in Statistics provides students with the foundations in theory and practice required for careers in applied statistics. In addition to the education traditionally offered in such a program, the department offers a concentration in industrial statistics, which provides unique opportunities for experiences in practical applications of statistics. Through involvement in the University of Tennessee Practical Strategies for Process Improvement Institute and related programs, department faculty participate in a variety of consulting and research projects in industry. Students may supplement their classroom study with an industrial internship and participation in research projects dealing with industrial problems. Department faculty also collaborate with researchers from many academic disciplines. Statistics graduate students may gain consulting experience by working with faculty involved in these consulting activities. All students are encouraged to participate in supervised internship or consulting activities as part of their graduate program.

Individuals with undergraduate or graduate degrees in other disciplines are encouraged to enter the program. The candidate's mathematics background should include differential and integral calculus of several variables. Individuals with limited mathematics background should seek departmental guidance regarding specific ways in which they may prepare themselves for the program by taking coursework as non-degree students. Requests for application forms and further information may be sent to the Director of Graduate Studies, Department of Statistics, Stokely Management Center, University of Tennessee, Knoxville, Tennessee 37996-0532 or mleitnaker@utk.edu or http://www.bus.utk.edu/STAT.

**Admission Requirements**

General admission requirements for graduate studies are stated beginning on page 12. Applicants for Statistics must submit results of the Graduate Record Examination (GRE) general portion, although GMAT exam scores may be substituted. Applicants for the statistics program must have completed at least two years of college-level mathematics, including the calculus of several variables and matrix algebra, and be proficient in a computer language. Applicants whose native language is other than English must submit results of the Test of English as a Foreign Language (TOEFL).

**Curriculum**

A minimum of 33 credit hours must be completed for the master's degree. Required of all students is 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
Doctorate in home department, minor in Statistics 24
Doctorate in home department, M.S. in Statistics* 24

*The M.S. in Statistics requires 33 hours.

Course options consist of courses in statistics, offered either by the Department of Statistics or by other departments, which have been reviewed and approved by the IGSP Executive Committee. Students taking an M.S. in Statistics must pass the two-part comprehensive examination covering statistical theory and methods. Students taking a minor in Statistics in conjunction with a doctorate in another field must pass a written comprehensive examination in Statistics, constructed and evaluated by the student's 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 Executive Committee. That 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 assist the student in obtaining a Department of Statistics faculty member to serve on the student’s graduate committee.

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 msysonger@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 makes the place where 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 program is designed 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 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 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.

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.

531 Survey of Statistical Methods I (3) Univariate and bivariate data collection and organization, statistical estimation and hypothesis testing; treatment of relationships for categorical and numerical data, including Chi-square tests and simple linear and quadratic regression. Use of computing facilities required. Credit not given for both 531 and 537. Prereq: 1 yr college mathematics.

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.

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 non-parametric 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.

538 Statistics for Research II (3) General linear model as applied to multiple regression and analysis of variance. Diagnostic and influence techniques. One-way, factorial, blocking, and nested designs, preplanned versus post-hoc contrasts. Random factors and repeated measures. Prereq: 537 or 532.

561 Introduction to Computing for Data Management and Analysis (1) UT computing environment for beginning statistics graduate students. Use of operating system commands, shell, 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.


564 Theory of Statistical Inference (3) Introductory theory underlying common statistical procedures of hypothesis testing and estimation. Prereq: 538.

566 Statistical Techniques in Industrial Processes (3) Applications of control charts and other statistical techniques in industrial setting. Attributes and 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.


571 Statistical Methods (3) Data collection strategies. Descriptive statistics. Probability distributions, simulation of random variables, sampling distributions. Estimation and hypothesis testing, regression, Chi-Square test for categorical data, simple design of experiments, nonparametric methods. Use of statistical software. Prereq: 1 yr of calculus and a statistics course.


573 Design of Experiments (3) One-way ANOVA, multiple range tests, equal and unequal variances, transformations; factorial experiments, completely random designs, analysis of covariance, split-plot and nested designs, fractional factorials, sequential designs. Prereq: 571.

574 Data Mining Methods and Applications (3) Understanding and application of data mining methods. Data preparation; exploratory data analysis and visualization; cluster analysis; logistic regression; decision trees; neural networks; association rules; model assessment; and other topics. Applications to real world data. Use of standard computer packages. Prereq: Stat 532 or Stat 538 or Stat 571, or consent of instructor.

575 Applied Time Series (3) Fundamental concepts of time series analysis: Box-Jenkins approach, stationary and nonstationary models, forecasting model identification, seasonal models, transfer function models, and spectral theory. Prereq: 538 or 572 or consent of instructor.

576 Categorical Data Analysis (3) Log-linear analysis of multidimensional contingency tables. Logistic regression. Theory, applications, and use of statistical software (e.g., SAS, R). Prereq: Stat 538 or consent of instructor. Prereq: 571 and analysis of variance, or consent of instructor.


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 instructor.

587 Graduate Seminar (1) Directed readings and active participation in colloquium program of Department of Statistics and of student’s minor program. Prereq: Consent of 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 topics or areas 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 report or detailed diary. Prereq: 572 or 538. May be repeated. Maximum 6 hrs.

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


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, information testing of significance with multivariate data, multivariate analysis of variance, multivariate regression and variable selection, multivariate cluster analysis, common principal component model, factor analysis model, covariance structural models with latent variables, mixture-model cluster 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/N/C 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
(du College of Arts and Sciences)

MAJOR DEGREE

Blake Robison, Head

Professors:
Black, W., M.F.A. ......................... Illinois
Custer, M., M.F.A. ....................... Wisconsin

Associate Professors:
Craven, E. H., M.A. ...................... Tennessee
Gould, B. K., M.F.A. .................... Catholic
Weber, T., M.F.A. ....................... Alabama

Assistant Professors:
Heil, M., M.F.A. ......................... Texas
Speas, B., M.F.A. ....................... Virginia
Van den Berg, Klaus, Ph.D. .......... Indiana
Veager, 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, lighting design, scene design, and performance. 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 in the first year of residence. Three additional hours at the 500 level are required from history, literature, or dramaturgy. Students in the M.F.A. degree program are evaluated annually by juried performance or portfolio submission. Continuation in the program is with the approval of the faculty committee for the M.F.A. degree program. Theatre 599, Projects in Lieu of Thesis, and an oral defense of the project must be completed satisfactorily before the degree is conferred.

In addition to the core requirements listed above, each area of concentration has specific requirements.

Design
Required courses are at least 12 hours of Theatre 580, Design Seminar, and at least 6 hours in the projects courses. Theatre 503 Elements of Design for Theatre 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

409 Stage Make-up (3) Study and problems in makeup 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.

425 Selected Musical Theatre Techniques (2) Study and practice of musical theatre material: dance and vocal work. May be repeated. Maximum 4 hrs.


440 Advanced Theatre Costume Design (3) Costume as expressive element in dramatic production. Prereq: 345.

445 Advanced Costume Construction (3) Advanced studies in construction technique, tailoring, vacuum forming, plastic molding, and cobbling. Prereq: 345 or consent of instructor.

446 Costume Pattern (3) Draping patterns for period costume; construction and study of historic patterns 1500-1900. Prereq: 345 or consent of instructor.

450 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.

451 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.

452 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.

454 Scenery Painting (2) Introduction to materials, techniques, and principles of craft. Gaining skill and understanding through studio experience. Prereq: Consent of instructor.
456 Rendering (3) Techniques in monochrome and full color illustration of space and form. Prereq: Acquaintance with basic mechanical perspective and freehand sketching.

462 Advanced Lighting Design (3) Advanced lighting design and production. Lab and project intensive. Prereq: Theatre 362 or consent of instructor.

464 Computer Assisted Design for Theatre (3) Advanced techniques in computer assisted design for theatre. Work with CAD, Computer Drawing, Graphical, and 3D Modeling software for preparation of theatrical designs. Specific content varies with semester. Admission by consent of instructor only. May be repeated. Maximum 9 hrs.

470 Playwriting (3) Advanced instruction in writing of plays. Prereq: Consent of instructor.

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

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

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

501 Introduction to Graduate Research in Theatre (3) Research tools and methods for theatre artist and scholar.

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.

503 Elements of Design for the Theatre (3) Analysis of principles of design through visual, structural, and emotional relationships.

510 Studies in Theatre History (3) Intensive study of selected topics in theatre history. May be repeated. Maximum 9 hrs.

512 Dramatic Literature Analysis (3) Dramaturgical strategies of major playwrights, using variety of analytical approaches from Aristotelian to deconstruction.

520 Master Class in Performance : Acting (3) Master class in acting techniques. Theatre MFA students only. May be repeated. Maximum 18 hrs.

523 Master Class in Performance: Movement (3) Master class in movement techniques. Theatre MFA students only. May be repeated. Maximum 18 hrs.

525 Master Class in Performance: Voice (3) Master class in voice and speech techniques. Theatre MFA students only. May be repeated. Maximum 18 hrs.

536 Projects in Play Directing (3) Practical work in play direction involving various lengths and kinds of scripts. May be repeated. Maximum 18 hrs.

542 The Social History of Costume (3) Study and analysis of costume as related to society's manners and mores, architecture and furniture.


545 Millinery for the Stage (2) Pattern making and construction techniques for hats from antiquity to present. Prereq: Consent of instructor.

546 Advanced Costume Patternning (3) Advanced studies in patterning period costume. Development of historic patterns through flat pattern method. Prereq: 446.

547 Painting and Dyeing for the Theatre (3) Fibers, dyes and dye processes; color matching and distressing.

549 Projects in Costume Technology (1-3) Individualized studies in costume technology in theatre production. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.


551-552 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.

553 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.

554 Studies in Scenic Design (3) Advanced scene design techniques and approaches to design for complex dramatic and varied dramatic forms. May be repeated. Maximum 6 hrs.

555 Model Building (3) Techniques of model building for scenic designer. Theatre MFA students only. Prereq: 401 and one semester of 580.

556 Drafting (3) Drafting techniques for scenic designer. Theatre MFA students only.

560 Lab Analysis of Realized Lighting Design (3) Realized lighting design projects from concept meeting through opening night. Prereq: Consent of instructor. May be repeated. Max 18 hrs.

562 Special Problems in Lighting Design (3) Advanced problems in lighting design and theory, problems in casting and tourng. Prereq: Consent of instructor.

564 Computer Aided Drafting for the Theatre (3) Computer drafting programs and their use in theatre design and production. Prereq: Consent of instructor.

570 Design Seminar (1-6) Analysis, research, interpretation, and design of plays in a cross-disciplinary environment. May be repeated. Maximum 18 hrs.

584 Photography for the Theatre (3) Photographic techniques for shooting live performance events under challenging lighting environments. Prereq: Consent of instructor.

585 Production Workshops (1-6) Directed experience in production collaborations. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

587 Computer Aided Rendering for the Theatre (3) Computer rendering programs and their use by theatrical designers. Prereq: Consent of instructor.

593 Independent Study (1-3) Individual or group projects. Available to Theatre MFA students only. Prereq: Consent of instructor. May be repeated. Maximum 15 hrs.

599 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.

599 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 Theatre Education offers graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Teacher Education

Track 1 (for previously licensed teachers and does not result in a teaching license).

Art education

Early childhood special education

Education of the deaf and hard of hearing

Elementary education

English education

Foreign language/ESL education

Mathematics education

Modified and comprehensive special education

Reading education

Science education

Social science education

Track 2 (for individuals who are seeking an initial teaching license.)

Art education

Early childhood special education

Education of the deaf and hard of hearing

Elementary teaching

Modified and comprehensive special education

Secondary teaching

Educational Specialist

Teacher Education

Elementary education

English education

Foreign languages education

Mathematics education

Reading education

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**Theory and Practice in Teacher Education**

(College of Education, Health, and Human Sciences)

**MAJORS**

**DEGREES**

Education

Teacher Education

Ph.D.

Ed.D., Ed.S., M.S.

L. Knight, Head

Professors:

Benner, Susan M., Ed.D. .......... Columbia

Brozo, William G., Ph.D. .......... South Carolina

Davis, A. R., Ph.D. .......... Ohio State

Davis-Wiley, Patricia, Ed.D. .......... Houston

Hargis, Charles H. (Liaison),

Ed.D. .......... Colorado State

Hatch, J. Asmo, Ph.D. .......... Florida

Jost, Karl J., Ed.D. .......... Oklahoma

Knight, Lester N., Ph.D. .......... Texas

Lindy, LeVerne B., Ed.D. .......... Mississippi

Long, Vena M., Ph.D. .......... Missouri (Columbia)

Rowell, C. Glennon, Ed.D. .......... Georgia

Schindler, W. Jean, Ph.D. .......... Kent State

Turner, T. N., Ed.D. .......... Penn State

Associate Professors:

Barclay, McLaughlin, Ph.D. .......... Michigan


Chance, Charles A., Ph.D. .......... Iowa State

Gilrane, Colleen P., Ph.D. .......... Illinois

Hannum, Michael C., Ed.D. .......... Northern Colorado

Hodge, R. L., Ph.D. .......... Texas

Judge, Sharon L., Ph.D. .......... California (Santa Barbara)

Melear, Olaer 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, Krist T., Ph.D. .......... Texas A&M

Taylor, Mark P., Ph.D. .......... Illinois

Emeriti Faculty:

Christensen, Mark A., Ph.D. .......... Kansas

Harris, G. A., Jr., Ph.D. .......... Michigan

Huff, P., Ph.D. .......... Oregon State

Hull, Howard N., Ed.S. .......... Peabody

Watkins, J. Paul, M.S. .......... Tennessee
The College of Education, Health and Human Sciences offers the Master of Science, Educational Specialist, Doctor of Education, and Doctor of Philosophy degrees through the Department of 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 masters degree with a major in Education.

The department also houses programs for students seeking licensure in early childhood, primary, and middle school education (Grades K-8), reading endorsement, special education, secondary social studies, and licensure in the education of the deaf/hard of hearing. Early childhood licensure and degree programs are also available in the college. The department houses four Program Areas: (1) education of the deaf/hard of hearing/educational interpreting; (2) holistic/teaching/learning; (3) content fields teaching; and (4) urban/multicultural teacher education.

The deaf/hard of hearing/educational interpreting program area focuses on preparing teachers for deaf and hard of hearing children and youth Pre-K-12. Preparation emphasizes the ability to teach children with a hearing loss using all modes of communication (e.g. aural/oral, sign systems, American Sign Language) and in residential or inclusive settings. Educational interpreting is a concentration under the undergraduate special education program. Courses are designed to prepare interpreters to work in mainstream (K-12) settings with deaf and hard of hearing students. Educational interpreters facilitate communication between deaf and hard of hearing students and other non-signing members of the school community, including teachers and learning classmates.

The holistic teaching/learning area’s central emphasis is on holistic, integrative, and interdisciplinary teaching/learning as opposed to teaching disciplinary subject content (e.g., science, mathematics, language arts) as separate entities. The focus on integration is similar to how children learn and how language is central to the teaching/learning process. The faculty believe that students should be prepared as teachers who can facilitate learning rather than merely dispense content. Central to the philosophy of holistic teaching and learning is knowing each individual child’s learning skills, abilities, and interests. The holistic teaching/learning program area houses programs in elementary education, reading education, and special education.

The urban/multicultural teacher education area offers programs for students interested in teaching children of all ability levels in K-8 urban and multicultural settings. Faculty promote innovation in education through alternative approaches to instructional delivery, curriculum development, assessment, and program evaluation. The area also provides preparation in early childhood special education for special educators working in classroom, home-based, and community settings.

The content field teaching area’s mission is the preparation of teachers for instruction in art, ESL, English, foreign language, mathematics, social science and science. The emphasis is on how these disciplines are taught in context of different cultures.

For admission, most programs expect the GRE to be completed. The minimum required scores are 3.0 in the major and 3.0 overall. The Praxis Test 5103 Reading Education: Teaching All Students is required for candidates with a bachelor’s degree in a discipline other than education who are seeking initial teacher licensure. The Praxis Test 5101 English as a Second Language is required for candidates with a bachelor’s degree in a discipline other than education who are seeking initial teacher licensure.

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The master’s degree in Teacher Education has two tracks. Track 1 is intended for students who are licensed to teach art, English, elementary education, foreign language, mathematics, natural science, reading education, 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 the non-licensure program.) Track 2 is designed for students seeking initial teacher licensure in one of the above fields. Both Track 1 and Track 2 offer thesis and non-thesis options and require students to submit to a written comprehensive examination. In addition, students completing theses must sit for an oral examination on their thesis.

**TRACK 1 (NON-LICENSED)**

**Concentrations Offered Track 1**
- Art education
- Early childhood special education
- Education of the deaf and hard of hearing
- Elementary education
- English education
- Foreign language/ESL education
- Mathematics education
- Modified and comprehensive special education
- Reading education
- Science education
- Social science education

**Admission Requirements Track 1**
- Hold a Bachelors Degree; minimum 2.80 GPA (3.0 in major)
- Hold a valid teaching license.
- Present acceptable scores on the Praxis II: National Teachers Examinations (information about these exams and exemptions to them is available in the College’s Student Services Center, A332 Claxton Complex).

Submit a Post-Baccalaureate Teacher Education Program of Study (i.e., a written plan resulting from transcript analysis that addresses possible course deficiencies; see the College’s Student Services Center, A332 Claxton Complex)

Post-baccalaureate candidates seeking to teach in a field apart from their undergraduate major must complete 30 semester hours, to include 15 at the 300 level or higher, in addition to the requirements described above. Enrollment may begin in any academic term after notification of admission by letter, both from the Office of Graduate Studies and the College of Education, Health and Human Sciences.

**Completing Degree Requirements**
Meet each semester with a faculty advisor to assess progress and to discuss next semester courses.
Admitted candidates will complete a prescribed set of courses:
- Core Area: Education Foundations, Trends and Issues, Research (9 hours minimum).
- Major Area: Specialization Courses (12 hours minimum); and Related Studies (6 hours minimum)

Completion of thesis or non-thesis option:
Thesis: 30 semester hours of Education, satisfactory completion of written thesis, comprehensive written examination, and oral defense of thesis; 2/3 of total hours for MS must be 500-level or above.
Non-Thesis: 33 semester hours (36 semester hours for early childhood special education, modified and comprehensive special education and education of deaf and hard of hearing) and satisfactory completion of written comprehensive examination; 2/3 of total hours for MS must be 500 level or above.

**PROGRAMS OF STUDY**

**TRACK 1: Non-Licensure**

- **Art Education (Track 1)**
  - Core
    - TPTE 517
    - ITCE 580
  - Concentration
    - (Non-Thesis Option) 21
    - (Thesis option) 18
  - Admission Requirements Track 1
    - Hold a Bachelors Degree; minimum 2.80 GPA (3.0 in major)
    - Hold a valid teaching license.
    - Present acceptable scores on the Praxis II: National Teachers Examinations (information about these exams and exemptions to them is available in the College’s Student Services Center, A332 Claxton Complex).

- **Total Hours**
  - Non-Thesis Option 33
  - Thesis Option 30
Advising Note:
1. The Track 1 M.S. serves those students who have a BS, BA, or BFA Degree and desire a Master’s Degree, but do not wish to pursue certification to teach art, or who already have certification to teach art and wish to pursue a Master’s.
2. An exhibition offered instead of a Thesis toward graduation must be of work directed by art and art education faculty, and the artwork completed while pursuing the Master’s Degree. A written paper must accompany the exhibition. The paper includes: (a) a philosophical statement, (b) process and media explanation (demonstration of knowledge); (c) compositional analysis of each work; and (d) how the work relates to one’s personal artist statement.
3. For both tracks, a comprehensive written examination is required during the final semester of work. An oral exam is given over the thesis, Students are expected to read and meet requirements of the Graduate School with regard to admission applications, candidacy forms, scheduling comprehensive examination, and meeting all the unit requirements regarding the courses in their graduate program.

• Content Fields Teaching (Track 1)
(Concentrations in English Education, English as a Second Language Education, Foreign Language Education, Mathematics Education, Science Education, Social Science Education)

Credit Hours
Core Area
ITCE Research (Non-Thesis) or ITCE 520 Research (Thesis) 3
TPTE 517 Current Trends and Issues 3
Choose one:
CS 511 History of American Education 3
CS 526 Philosophy of Education 3
ITCE 535 Program Evaluation in Education 3
ITCE 541 High School Curriculum 3
ITCE 558 Curriculum Planning and Development 3
Major Area (12 hours, minimum) 12
Specially Education Area courses (400-500 levels) 3
Related Studies (6 hours, minimum) 6
Choose courses in one area: Art, Reading, English as a Second Language English, Mathematics, Science, Drama, Communications, School Administration, History, Instructional Technology, etc. 6
Electives (3 hours, minimum) 3
Thesis Option Only
TPTE 500 Thesis 3
TOTAL HOURS
(The Thesis Option) 30
(Non-Thesis Option) 33

• Early Childhood Special Education (Track 1)
Course Credit Hours
Audiology and Speech Pathology 563 3
Early Childhood Education 554 3
Early Childhood Education 566 3
Early Childhood Education 567 3
Early Childhood Education 568 3
Special Education 504 6

Child and Family Studies 530 3
Instructional Technology 580 3
(Other approved research design class may be substituted)
Electives 9
(Advisor approval required)

Total Hours 36

• Education of the Deaf and Hard of Hearing (Track 1)
Contact the department head for information on this concentration

• Elementary Education (Track 1)

Core
Credit Hours
(Non-Thesis Option) 12
(Thesis Option) 9
ITCE 580 3
TPTE 517 3
Determined by student and advisor 3-6

Concentration
Credit Hours
(Non-Thesis Option) 15
(Thesis Option) 12
Choose from at least three areas:

Related Studies
Credit Hours
(Non-Thesis Option) 6
(Thesis Option) 3
Determined by student and advisor
Thesis Option only
TPTE 500 6

Total Hours
Non-Thesis Option 33
Thesis Option 30

• Modified and Comprehensive Special Education (Track 1)

Core
Credit Hours
Special Educ. 587 or TPTE 51 9
Special Educ. 586 3
Special Educ. 590 3

Concentration
Credit Hours
Select (with major advisor) from:
Affective/Motivational Disorders 6-9
General Special Education 6-9
Elementary Education 6-9
Reading Education 6-9
Cognitive Education 6-9
Gifted Education 6-9
Modified Programs 6-12
Comprehensive Programs 6-12
Others by Committee approval

Thesis Option
Courses 24
Thesis
TPTE 500 Thesis 6
OR
Problem Courses in lieu of Thesis 30
Additional Problems Courses 6

Oral Exam over Problems Courses

Total Hours
Non-Thesis Option 36
Thesis Option 30

• Reading Education (Track 1)

Core
Credit Hours
(Non-Thesis Option) 12
ITCE 580, TPTE 517 9
Determined by student and advisor (6)
(Thesis Option) 19
ITCE 580, TPTE 517 9
Determined by student and advisor (3)

Concentration
Credit Hours
Thesis (Non-Thesis, Thesis Options) 33
Choose from Reading Education 12
Related Studies (Non-Thesis Option) 9
(Thesis Option) 3
Choose 3 hrs from Language Arts Education, English Education, Early Childhood Education, Elementary Curriculum, Middle School Curriculum, Special Education, or Educational Psychology

Thesis Option only

TPTE 500 6

Total Hours
Non-Thesis Option 33
Thesis Option 30

Track 2: Initial Licensure Programs

The Track 2 Masters is intended for individuals desiring to earn teacher licensure. Applicants to this program must first be admitted to Teacher Education and complete the equivalent of an undergraduate minor in either Elementary, Middle School, or Secondary Education. Post-baccalaureate students interested in seeking licensure in Art Education, Special Education, or in other fields that require students to earn an undergraduate major would be expected to complete an equivalent undergraduate program of study. Please refer to The University of Tennessee’s Undergraduate Catalog for complete details. Individuals are encouraged to contact the College’s Student Services Center, A332 Claxton Complex, for a diagnostic interview and to develop a tentative course of study and time line.

• MS Track 2 Common Course Requirements

Master’s Track 2 programs are 36 credit hour, non-thesis (42 credit hour thesis) programs; students, regardless of teaching area (e.g., Elementary, Secondary, etc.), complete a common, teacher licensure, core of 24 credit hours during the Professional Year (see below):

Professional Year Courses
Credit Hours
Education 574: Analysis of Teaching for Professional Development 2
Education 575: Professional Internship 12
Education 591: Clinical Studies 4
Specialty Studies 6

Theory and Practice in Teacher Education 193
THE SPECIALIST IN EDUCATION PROGRAM

The Educational Specialist degree program with a major encompasses concentrations in:

- Elementary education
- English education
- Foreign language/ESL education
- Mathematics education
- Reading education
- 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. Both thesis and non-thesis options are available.

Degree Program Requirements

An MS/MA is required for admission; most programs in Theory and Practice in Teacher Education also require a minimum of three years of professional experience.

• MS Track: Additional Course Requirements

  In addition to the above common core of courses, students must complete an additional 12 credit hours of course work that is unique to their particular teacher preparation field (see below):

Early Childhood Special Education

Early Childhood Education 554, 566, 567, 568 12

Education of the Deaf and Hard of Hearing

Research Elective 3
Non-Specified Elective 9

Elementary Teaching

TPTE 517: Trends and Issues in Education 3
Educational Electives (chosen from at least three areas): 9
Historical, Philosophical, or Social Foundations, Instructional Technology, Reading Education, Language Arts Education, Science education, Social Science Education, Elementary Education, Middle School Curriculum

Modified and Comprehensive Special Education

Special Education 553: Assessment of Special Students 3
Special Education 590: Application of Microcomputer Technology in Special Education and Vocational Rehabilitation 3
Electives (see advisor) 6

THE DOCTOR OF EDUCATION PROGRAM

The Ed.D. is offered with a major in Teacher Education and concentrations and specializations in the following areas:

- Literacy, language, and ESL education (literacy, English education, ESL education)
- Teacher education (elementary education, social science education, mathematics education, science education)

The program requirements are:

- The total EdS Program involves a minimum of four semesters of study with no fewer than 60 semester hours of graduate credit beyond the baccalaureate, including research/thesis hours.
- 400-level education courses required for licensure are not eligible.
- At least 2/3 of semester hours accumulated in MS/MA and all of the last 30 semester hours of coursework must be in 500-600-level courses.
- The EdS thesis must be approved by the student’s committee prior to submission to the Office of Graduate Studies for final approval and acceptance. The student must register for thesis hours during this time.
- Residency requirements include full-time registration during a given semester on the UT campus. The summer term is included in this period.

Credit Hours

Core Area

Must include two areas from the following, not including the area of specialization:

- Curriculum or Leadership
- Anthropological, Historical, Philosophical or Social Foundations
- Human Growth and Development
- PreK-14 Teaching Methodology
- Instructional Technology

Specialization

a. Research 6
   TPTE 518 Educational Specialist Research
   Thesis 500 6

b. Concentration 12
   Specialty Area Methods
   TPTE 593, 594, 595 Independent Study, Supervised Readings, Special Topics 12

Related Studies

6
Must be related to focus of degree and must be outside Specialty Area education program, e.g., English, Reading, Speech, Drama, Communication, Instructional Technology, Math, Science, Social Sciences

Total Hours

Non-Thesis 36
Thesis 30

Concentration in Literacy, Language and ESL Education (Literacy, Foreign Language Education, English Education and English as a Second Language)

Credit Hours

Concentration

Elementary Education 504 Studies in Language Development 3
TPTE 595 Teaching English Grammar 3
FL/ESL 578 Teaching English as a Second Language 3
TPTE 595 Teaching Adolescent Literature 3
FL/ESL 678 Advanced Studies in English as a Second Language 3

Cognate 1: in a related field in CEHHS, outside CEHHS, in a related field selected by the candidate and major professor; e.g., Instructional Technology, School Administration. Plus: TPTE 604 Doctoral Seminar 2

Cognate 2: outside CEHHS, in a related field selected by the candidate and major professor; e.g., English Language Arts, Reading, Speech, Drama, Communication

Research: to include:

- ITCE 561 Statistics 3
- ITCE 671 Advanced Statistics 3
- CS 560 Introduction to Qualitative Research 3

Plus: 6 hours selected from Research and/or Survey Techniques: ITCE 823 or Sociology 531, 534 or 633 3

Concentration in Teacher Education

Contact the department head for information on concentrations in elementary education, social science education, mathematics education, science education.
Concentration Courses

The following constitute the courses typically taken by students enrolled in the above cited concentrations:

Early Childhood Education

Concentration:

ECE 604 Seminar in Curriculum and Instruction
TPTE 610 Internship in Teaching and Supervision
SPED 620 Internship in Research in Special Education
SPED 630 Internship in Institutional Leadership
TPTE 640 Theoretical Analysis and Theory Construction
ECE 650 Advanced Studies in Early Childhood Education
TPTE 679 Special Topics
TPTE 689 Internship
TPTE 693 Independent Study
TPTE 694 Supervised Readings
TPTE 695 Special Topics

Specialization: ECE or ECSE (minimum 9 credits)

ECE 554 Assessment in ECSE
ECE 566 Curriculum in ECE
ECE 567 Application of Theory in Early Childhood Education
ECE 568 ECSE: Theories and Interventions
TPTE 579 Special Topics
SPED 584 Seminar in Early Childhood Education
SPED 504 Clinical Experience in Teaching and Supervision of Exceptional Children

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 hour, 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 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.

Early Childhood Education

Graduate Courses

445 Early Childhood Education: Program Development and Teaching in Kindergarten (3) Curriculum planning, classroom organization and management practices for teaching young children; relationship of kindergarten to total elementary school. Prerequisite: Admission to teacher education.

471 Early Childhood Special Education (6) Assessment, curriculum planning and development and teaching approaches used in early childhood special education. Prerequisite: Admission to teacher education.

515 Seminar (1-3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to goals of students' programs. May be repeated. Maximum 6 hrs. S/NC only.

554 Assessment in Early Childhood Special Education (3) Development of knowledge and skills in appropriate formal and informal assessments of handicapped infants and young children: screening, identification, diagnosis, placement and programming assessment issues. Prerequisite: 553 or consent of instructor.

566 Curriculum for Early Childhood Education (K-3) (3) Theoretical foundations and current research in content and skill areas of curriculum for kindergarten through grade 3; application to local school setting. Prerequisite: 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. Prerequisite: Course in early childhood education or consent of instructor. May be repeated. Maximum 6 hrs.

568 Early Childhood Special Education: Theories and Practices (3) Theoretical perspectives of early childhood special education; exploration of grammatical models, family-focused concepts and curriculum development.

584 Seminar in Early Childhood Education (3) Analysis of research and theory in early childhood education; educative process of young children. Prerequisite: Course in early childhood education. May be repeated. Maximum 6 hrs.

650 Advanced Studies in Early Childhood Education (3) Prerequisite: 2 graduate courses in early childhood education and consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

Art Education

Graduate Courses

510 History and Philosophy of Art Education (3) United States from 1860's to present. Prerequisite: Consent of instructor.

520 Studies in Art Education (3) Issues and topics current to the field of art education. Prerequisite: 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.

Education of the Deaf and Hard of Hearing

Graduate Courses

415 Language Development of Deaf/Hard of Hearing I (3) Language problems of hearing impaired contrasted with scope and sequence of normal language development. Formal linguistic systems used to describe language development problems.

416 Language Development of Deaf/Hard of Hearing II (3) Developmental and remedial systems of teaching language for hearing impaired children: Comprehension and production differences, idiosyncratic and figurative structures. Prerequisite: 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 habituation. 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 audiologic 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 methodology, language development and education of hearing impaired. Survey of literature. Visits to programs.

504 Clinical Experience in Teaching an Supervision of Exceptional Children (3-9) (Same as Special Education 504.)

509 Vocational Guidance and Career Planning With Hearing Impaired (3) Utilization of psychological, educational, social and vocational, diagnostic materials and resources appropriate for hearing impaired persons to provide guidance in career decisions and individualized rehabilitation plan.

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 methods necessary to teach the prelingually 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.

579 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 9 hrs. S/NC or letter grade.

Educational Interpreting

GRADUATE COURSES

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.

Elementary Education

Note: See Mathematics, Reading, Science, and Social Science Education for additional Elementary Education courses.

GRADUATE COURSES

421 Elementary and Middle School Science and Social Studies Instruction (3) Methods and materials for teaching science and social studies. Development of functional relationships and entities of two fields. Not open to students with recent course or background in teaching science and/or social studies. Prereq: Admission to teacher education.

429 Language Arts/Reading Instruction in Elementary and Middle Schools (3) Language and language development as applied to teaching of oracy (listening-speaking) and aspects of literacy (reading process/reading and writing). Not open to students with recent course in language arts methods. Prereq: Admission to teacher education.

504 Studies and Theory in Language Development (3) Studies and theory of language development in children. Prereq: 1 elementary school language arts course or consent of instructor.

505 Elementary and Middle School Teaching Methods II (8) Applied methods of teaching reading, language arts, science, social studies and mathematics; accommodation strategies for students with diverse needs. Prereq: Elementary and Middle School Teaching Methods I. Coreq: 575.

523 Diagnosis and Correction of Children's Difficulties in Learning Mathematics (3) Children's difficulties in learning mathematics and procedures for helping classroom teacher correct difficulties. Prereq: 522 or equivalent or consent of instructor.


527 Elementary School Curriculum (3) Examination, evaluation and application of curriculum designs in elementary school. Trends and issues which affect elementary education. Prereq: Consent of instructor.

528 Teaching Language Arts Elementary and Middle School (3) Recent trends and current materials and methods in teaching elementary language arts (except reading). Prereq: Course in language arts or consent of instructor.

529 Practicum in Diagnosis and Remediaion of Difficulties in Learning Mathematics (3) Assessment and practicum experience with children having difficulties in learning elementary school mathematics. Prereq: 523 or consent of instructor.

550 Assessment and Correction of Language Arts Difficulties (3) Procedures and materials for diagnosing and correcting language arts difficulties; analysis of children's work. Prereq: At least one language arts course or consent of instructor.

606 Research in Elementary Education (3) Analysis of research in elementary education with application to classroom teaching. Prereq: Research course.

651 Advanced Studies in Elementary School Language Arts (3) Selected issues in elementary school language arts. Prereq: Graduate course in elementary school language arts or consent of instructor.

Foreign Language/ESL Education

GRADUATE COURSES

455 Teaching of Foreign Languages, Grades 7-12 (3) Instructional methods, lesson planning, peer teaching; materials for teaching foreign language and culture; evaluation techniques. Required for certification in modern foreign languages and Latin. Prereq: Completion or near completion of foreign language hours for certification and Admission to teacher education.

555 Foreign Language in the Elementary Schools Practicum (3) Experiences designing, implementing and assessing second language instruction in elementary school setting. Prereq: 587 or consent of instructor.

556 English as a Second Language Practicum (3) Experiences designing, implementing and assessing English instruction to non-native English speakers. Required course for ESL certification. Prereq: 578 or consent of instructor.

578 Teaching English as a Second Language (3) Instructional methods; utilization of assessment procedures to diagnose English linguistic proficiency; materials for non-native speaker in K-12 classroom. Prereq: 528 or consent of instructor.


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.

687 Advanced Studies in Foreign Language Education (3) Research, curricula, assessment, trends and issues in foreign language education. Prereq: 587 or consent of instructor.

Mathematics Education

GRADUATE COURSES

485 Teaching Mathematics, Grades 7-12 (3) Preparation of teaching plans, evaluation, materials for teaching mathematics; teaching simulation and directed observation in schools. Prereq: Admission to teacher education.

522 Programs and Materials in 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.

530 Teaching Mathematics to Young Children: K-4 (3) Unit planning, daily planning, grouping and other strategies of teaching mathematics. For those with little preparation in teaching elementary school mathematics.

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.


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. Rationale for curriculum decisions. Prereq: 485, Elementary Education 505, or equivalent.
583 Teaching Mathematics in Senior High Schools and Community Colleges (3) Topics appropriate for high school and community/junior college mathematics curriculum, problems related to enrichment, problem solving, and use of microcomputers. Opportunities for special projects. Prereq: 485 or equivalent.

622 Research Trends in Mathematics Teacher Education (3) Analysis of current research trends in mathematics teacher education and impact of such research on development of teachers both preservice and in-service. Prereq: Minimum 9 hrs of 500-level Mathematics Education courses.

683 Advanced Studies in Mathematics Education (3) Analysis of current research in mathematics education and implications of research for classroom practice. Prereq: Two graduate courses in mathematics education.

Science Education

GRADUATE COURSES

496 Teaching Science Grades 7-12 (3) Methods, materials, recent trends in science and environmental education programs for secondary schools. Prereq: Admission to teacher education.


531 Teaching Science in Elementary and Middle Schools (3) Recent trends in methods, materials and content in teaching elementary school science. Prereq: Course in teaching elementary school science or consent of instructor.

565 Instructional Trends and Issues in Science Education (3) Analysis of current trends in science instruction, instructional issues facing elementary, secondary, and community college science teachers, and application of learning theory to teaching biological, physical, and environmental sciences. Prereq: 496, teaching methods, or equivalent.

572 Nature of Mathematics and Science Education (3) Teaching and assessment of mathematics and science based upon student conceptions of nature of mathematics and science.

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.


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.

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: 402 and admission to Teacher Education Program.

420 Field Experience in Modified Programs (3) Practicum in teaching in modified programs: planning, developing, implementing and evaluating instruction. Prereq: 402 and admission to Teacher Education Program. Coreq: 419. S/NC only.

431 Field Experience in Comprehensive Programs (3) Prereq: 402 and admission to Teacher Education Program. Coreq: 432. S/NC only.

432 Psychology and Education of Students with Moderate to Severe Disabilities (6) Characteristics of persons with moderate/severe disabilities and educational strategies appropriate for those persons. Prereq: 402 and admission to Teacher Education Program. Coreq: 431.

454 Education of the Gifted and Talented Children (3) Orientation to psychometric and behavioral studies of giftedness. Analysis of past and present school practices in reference to curriculum and program implementation. S/NC only.

456 Speech and Language Basis of Learning Disabilities in the Classroom (3) Normal communication development; understanding of speech and language impairments in school-age students; integration of oral language with written language in the curriculum, especially for high incidence special education students.

470 Psychology of the Exceptional Child (3) Varieties of exceptional children; general characteristics and educational needs. Implications of developmental variations for functioning as adults. Opportunity to expand study upon particular exceptionality. Enrollment limited to non-special education majors.

504 Clinical Experience in Teaching and Supervision of Exceptional Children (3-9) Placement in educational settings. May be repeated. Maximum 9 hrs. S/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 five-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 other innovative assessment approaches; advanced study of application to educational programming, basic statistics and application in assessment.

555 Characteristics of Affective/Motivational Functioning in Children with Disabilities (3) Definition, methods, identification and symptoms of children with affective/motivational development in disabled youngsters. Comparison to normal development and that of children labeled disturbed or behavior disordered.
556 Instructional Systems for Affective/Motivational Education for Children with Disabilities (3) Educational strategies and models of instruction; simulation, demonstration, and media. Teaching techniques, materials, and teacher/pupil/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 effects efficiency of classroom. Research on how curriculum can encourage age appropriate interactions of children and youth. Prereq: Admission to graduate program.

558 Neuromuscular and Health Disorders: Educational Implications (3) Neurological impairments; physical disabilities; mental health conditions, 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) Instructional methods and systems evaluated in terms of effectiveness in various educational environments. Prereq or coreq: 564 or consent of instructor.

575 Creative Problem-Solving Strategies for Special Educators (3) Techniques for solving problems encountered by special educators in any setting.

586 Seminar in Research Techniques in Special Education (3) Evaluation of appropriate research methodologies with handicapped populations.


590 Application of Microcomputer Technology in Special Education and Vocational Rehabilitation (3) Application of microcomputer technology with all categories of exceptionalities and across all chronological and functional age ranges. Microcomputer adaptive software, special switch access, authoring systems, telecommunication, and strategies for cognitive development.

620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional engaged in the educationally-based research: 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 practicitioner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

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.

535 Inquiry Teaching and Learning (3) Use of children’s and adolescent literature. Exploration of ways to create setting that invite learners to engage in inquiry learning and teaching.

540 Topics in Improvement of Instruction (1-3) Special conferences, workshops, and inservice programs. May be repeated. Maximum 6 hrs. S/NC or letter grade.

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.

594 Supervised Readings (1-3) May be repeated. S/NC or letter grade.

595 Special Topics (1-3) May be repeated. S/NC or letter grade.

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.

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

604 Seminar in Curriculum and Instruction (1) Required 2 consecutive semesters. S/NC only.

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.

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 studied. Prereq: Admission to doctoral program or consent of instructor.

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.


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.

693 Independent Study (1-3) May be repeated. S/NC or letter grade.

694 Supervised Reading (1-3) May be repeated. S/NC or letter grade.

695 Special Topics (1-3) May be repeated. S/NC or letter grade.

Transportation

See Marketing, Logistics and Transportation

Urban and Regional Planning

MAJOR  DEGREE

Planning ..................................................  M.S.P.

C. W. Minkel, Head

Professors:

Minkel, C. W., Ph.D. ......................... Syracuse
Spencer, James A. (Liaison), M.C.P. ................. Ohio State
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 requested 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 or graduate statistics course will be required to do so.

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 and use planning, environmental planning, real estate development planning, and transportation planning. Students have the latitude to propose an alternate specialization consisting of at least 9 hours of coursework, subject to approval of a faculty committee. Each student is required to demonstrate competence in individual research. This may be done in one of two ways:

**Thesis Option:** Complete a thesis for 6 hours credit; 

**Non-Thesis Option:** Complete a major study with acceptable documentation. To be eligible for the major study option, the student must have completed at least 12 hours of graduate coursework in planning with at least a 3.5 cumulative grade-point average. The student, meeting these criteria may present a proposal to his/her committee for a major study that will include at least 6 hours of subsequent coursework. The proposal 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 exam 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.

### Planning

#### GRADUATE COURSES

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>The City in the U.S. (3)</td>
<td>Development and character of U.S. cities. Contemporary issues and selected case studies. (Same as Urban Studies 401.)</td>
</tr>
<tr>
<td>Survey of Planning (3)</td>
<td>History of city development and of planning; U.S. experience in urban and other levels of planning. State of the art, process, comprehensive plan, implementation devices. Planning issues in society. Not for credit for M.S.P. degree.</td>
</tr>
<tr>
<td>Housing (3)</td>
<td>Nature and demand for housing in U.S. and abroad, U.S. experience. Private market processes and influences. Problems of change in housing supply, impact of new technology, and governmental programs to improve supply and quality of housing.</td>
</tr>
<tr>
<td>Registration for Use of Facilities (1-15)</td>
<td>Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty laboratories. May be repeated. S/NC only.</td>
</tr>
<tr>
<td>Fundamentals of Planning (3)</td>
<td>History of planning, structure and development of urban areas, operations of contemporary planning, trends and issues.</td>
</tr>
<tr>
<td>Theory of Planning (3)</td>
<td>Analysis of nature and objectives of planning process; role of planner and planning function in public decision-making. Prereq: 510 or consent of instructor.</td>
</tr>
<tr>
<td>Planning Research Methods (3)</td>
<td>Overall structuring of social science research in planning practice; familiarity with structure of planning literature information sources, systematic retrieval techniques, processes and tools, practice in posing research questions relevant to planning.</td>
</tr>
<tr>
<td>Information Systems and Networks in Planning (3)</td>
<td>Use and impact of computer-based information systems and global networks in planning and public management. Development of practical skills in design of planning-decision support systems, data-bases, Internet based tools and geographic information systems (GIS). Prereq: Basic experience with computer software and hardware or consent of instructor.</td>
</tr>
<tr>
<td>Planning Policy Analysis (3)</td>
<td>Basic methods of policy analysis and planning. Economic factors underlying the dynamics of change in cities and regions, Coreq: 520 or consent of instructor.</td>
</tr>
<tr>
<td>Land Use Analysis (3)</td>
<td>Concept and framework for land-use analysis. Population, employment, economic-base studies and forecasting techniques.</td>
</tr>
<tr>
<td>Planning Methods (4)</td>
<td>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.</td>
</tr>
<tr>
<td>Planning and Transportation (3)</td>
<td>(Same as Civil Engineering 558.)</td>
</tr>
<tr>
<td>Urban and Site Design (3-6)</td>
<td>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.</td>
</tr>
<tr>
<td>Planning for Historic Preservation (3)</td>
<td>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.</td>
</tr>
<tr>
<td>Legal Aspects of Planning (3)</td>
<td>Legal basis for planning and guiding community development. Legal tools of planning. Prereq: 510 or consent of instructor.</td>
</tr>
<tr>
<td>Cultural Resources Planning (3)</td>
<td>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.</td>
</tr>
<tr>
<td>Planning and Property Development (2)</td>
<td>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.</td>
</tr>
<tr>
<td>Negotiation (1)</td>
<td>Methods, strategies, techniques and skills useful to planners in mediation, negotiation, and dispute resolution concerning urban planning and development.</td>
</tr>
<tr>
<td>Tourism Planning (3)</td>
<td>Planning of tourist resources and programs within a geographic region. Tourism planning models. Relationships among tourists, tourism developments and planning of tourist attractions and services. Application of techniques in selected area.</td>
</tr>
<tr>
<td>Development Planning in the Third World (3)</td>
<td>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.)</td>
</tr>
<tr>
<td>International Planning (3)</td>
<td>Alternative development models. Comparative analysis of planning practices and policies around world. Population growth, urbanization, environmental degradation, and economic development in developing countries.</td>
</tr>
<tr>
<td>Environmental Planning (3)</td>
<td>Role of planners and planning in maintenance of balance between natural and built environment. (Same as Ecology and Evolutionary Biology 555.)</td>
</tr>
<tr>
<td>Futures Planning (3)</td>
<td>Overview of world and community futures literature. Skills in trends assessment, scenario writing, and other futures planning techniques.</td>
</tr>
<tr>
<td>Strategic Planning and Policy Development (3)</td>
<td>Models of strategic planning and process of policy development in applied decision making. Qualitative approaches, program evaluation and impact assessment.</td>
</tr>
<tr>
<td>Practicum (3)</td>
<td>Prereq: Consent of instructor. S/NC or letter grade.</td>
</tr>
<tr>
<td>Special Topics (1-3)</td>
<td>Prereq: Consent of instructor.</td>
</tr>
<tr>
<td>Readings in Planning (1-3)</td>
<td>Prereq: Consent of instructor. May be repeated.</td>
</tr>
<tr>
<td>Problems in Planning (1-3)</td>
<td>Prereq: Consent of instructor.</td>
</tr>
</tbody>
</table>

### Veterinary Medicine

(College of Veterinary Medicine)

#### MAJOR

<table>
<thead>
<tr>
<th>Degree</th>
<th>Veterinary Medicine</th>
<th>D.V.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative and Experimental Medicine</td>
<td>M.S., Ph.D.</td>
<td></td>
</tr>
</tbody>
</table>

#### 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 pre-veterinary 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. Pre-veterinary course requirements must be completed by the end of spring term of the year in which the applicant intends to enroll. Biochemistry requirements must have been satisfactorily completed within five years of the time the applicant wishes to enter the program.

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>6</td>
</tr>
<tr>
<td>Humanities and Social Sciences*</td>
<td>18</td>
</tr>
<tr>
<td>Physics</td>
<td>8</td>
</tr>
<tr>
<td>General Chemistry</td>
<td>8</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>8</td>
</tr>
</tbody>
</table>
**Biochemistry**  
**General Biology**  
**Genetics**  
**Cellular Biology**  

**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 Piver Drive, Room A102, Knoxville, Tennessee 37996-4500.

Note: The deadline for receipt of the completed application materials is November 1. NON-TENNESSEANS 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 and two. The final year of the professional curriculum begins immediately following semester six and is a continuous clinical rotation experience extending over 54 weeks.

Development of a strong basic science foundation is emphasized in the first year. Courses consist mostly of preclinical subjects of anatomy (gross and microscopic), physiology, immunology, bacteriology, virology and parasitology. Also included in the first year are clinical subjects of physical diagnosis and epidemiology. Considerable integration of subject matter is incorporated during this year.

The second and third years include the study of diseases, their causes, diagnosis, treatment and prevention, and courses are team-taught on an organ system basis.

The final year (three semesters) is devoted to intensive education in solving animal disease problems involving extensive clinical experience in the Veterinary Teaching Hospital. Each student will participate exclusively in clinical rotations in the Veterinary Teaching Hospital and in required externships (preferably off-campus).

Innovative features of this curriculum include: 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 sciences 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 curriculum requires successful completion of 164 semester credits.

**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, physiology, genetics and animal management), Microbiology (bacteriology, virology and immunology), Ecology and Evolutionary Biology (environmental toxicology), Public Health, and Comparative and Experimental Medicine. (Refer to other sections of this catalog for a full description of these programs.) The majority of the graduate students and graduate faculty of the College of Veterinary Medicine are involved in the Comparative and Experimental Medicine program. This program provides a wide spectrum of interdisciplinary training that prepares graduates for teaching and research careers in the health sciences.

**PROFESSIONAL COURSES**

801-02 Application Based Learning Exercise (ABLE), I, II (1,2) Small group, student-centered learning sessions with faculty facilitator for self discovery of new information. Based on specific clinical case or problem, and integration of basic science and clinical material. S/NC only.

804-05-06 Application Based Learning Exercise (ABLE) and Clinical Exposure I, II, III (2,2,2) Weekly small group, student-centered learning sessions with faculty facilitator for self discovery of new information; based on specific clinical case or problem; integration of basic science and clinical material. One week of clinical experience during participation in specific clinical rotations in Veterinary Teaching Hospital. S/NC only.

811 Infection and Immunity I—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 II—Immunology (2) Basic biology and practical aspects of immunology: cells of immune system, immune function and dysfunction, immunoprophylaxis and diagnostic 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. Thoughts on the spectrum of current veterinary ethical issues. 816—Student-led discussions follow faculty presentations.


821-22 Veterinary Anatomy I, II (6,6) Integrated approach to study of developmental, macroscopic (gross), and microscopic anatomy of common domestic animals. Dissections of embalmed specimens of common domestic species for comparative purposes. Microscopy relates structure with function. Study of developmental anatomy related to normal 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, pathology, 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 veterinarian.

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 determents 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. Immunology: cells of immune system, immune function and dysfunction, immunoprophylaxis and diagnostic testing and specific diseases involving immune system.


836 Toxicology (2) Principles of toxicology, molecular mechanisms, pathologic processes and clinical features of animal diseases caused by common toxic agents.

837 Food Hygiene and Zoonoses (2) Host-agent relationships, public health aspects of veterinary medicine and role of veterinarians in ecology and food hygiene.

840 Integumentary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of integumentary system. Laboratory examination, pathology, diagnosis and treatment.

841 Reproductive System (3) 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, 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 in all species of domestic and wild animals. Applied nutrition relating to individual small and large animal patient or to herd situations.
846 Multispecies Medicine (3) Anatomy, pathophysicsiology, 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 pharmacokinet- ics 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 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 avian 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 morphologic 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 experiences not associated with required clinical rotations may be arranged.

881 Clinical Rotations in Small Animal Clinical Sciences I (4) Clinical 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 laboratory diagnostics: clinical pathology 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.

894 Clinical Rotations in Large Animal Clinical Sciences IV (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.

896 Clinical Rotations in Large Animal Clinical Sciences V (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 I (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.
Bureau of Evaluation, Research, and Service
(College of Education, Health, and Human Sciences)

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.

The Center offers three executive track Masters of Business Administration degrees for working managers. Non-degree programs for the business community include general management programs, programs for process improvement, programs in lean enterprise practices and programs in supply chain management.

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.

A prominent feature of all programs is their applied nature. Through projects, assignments and workshops, participants use courses to analyze their organizations and implement immediate changes.

Additional information about the Center for Executive Education can be found at http://TheCenter.utk.edu.

Center for Information Studies
(College of Communication and Information)

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 401K Student Services Building, 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, Health, and Human Sciences)

The Center for Literacy Studies was founded in 1988. The Center's purpose 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 dixilee@utk.edu.

Center for Physical Activity and Health

(College of Education, Health, and Human Sciences)

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 dixilee@utk.edu.

Center for Transportation Research

(Office of Research)

Stephen H. Richards, Executive Director

The Center for Transportation Research, formerly the Transportation Center, was created in 1970 to foster and facilitate interdisciplinary research, public service, and outreach in the field of transportation at The University of Tennessee. It began operating full-time in 1972 and since then has contributed greatly to the overall research program of The University.

The Center, 600 Henley St., Suite 309, is a University-level organization administratively positioned within the Office of Research at UT. The Center’s multidisciplinary staff includes over 120 full-time researchers and technicians augmented with numerous faculty and students. The Center is 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 inter-disciplinary 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 in 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 Holy 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 and 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 of 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
Sommers-Murphy Chair of Excellence in Neurology
Mark S. Sowolow 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
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, Tennessee 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, Tennessee 37403
(423) 756-4787
(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, Tennessee 37996
(865) 974-5570
(rmoore1@utk.edu)

**Center of Excellence for Materials Processing**
Dr. Carl McHargue, Director
University of Tennessee
513 East Stadium Hall
Knoxville, Tennessee 37996-2351
(865) 974-7690
(cf@utk.edu)

**Center of Excellence for Neuroscience**
Dr. David V. Smith, Director
UT Health Science Center
875 Monroe Avenue
Memphis, Tennessee 38163
(901) 448-5957
(dvsmit@utmem.edu)

**Center of Excellence for Pediatric Pharmacokinetics and Therapeutics**
Dr. Richard A. Helms, Director
UT Health Science Center
62 S. Dunlap Street, Suite 210
Memphis, Tennessee 38163
(901) 448-6034
(rhelms@tennessee.edu)

**Center of Excellence for Science and Mathematics Education**
Dr. Geraldine Farmer, Interim Director
UT Martin
145 Gooch Hall
Martin, Tennessee 38238
(731) 587-7166
(jgfarmer@utm.edu)

**Molecular Resource Center of Excellence**
Dr. Michael E. Dockter, Director
UT Health Science Center
62 S. Dunlap, Suite 400
Memphis, Tennessee 38163
(901) 448-7105
(mdockter@tennessee.edu)

**The Science Alliance**
Dr. Jesse Poore, Director
University of Tennessee
101 South College
Knoxville, Tennessee 37996
(865) 974-6765
(jpoore@utk.edu)

**Waste Management Research and Education Institute**
Dr. Gary Saylor, Director
University of Tennessee
UT Conference Center, Suite 311
Knoxville, Tennessee 37996
(865) 974-8080
(saylor@utk.edu)

**Child Development Laboratories**
(College of Education, Health, and Human Sciences)
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 and students; 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/~utkcdcl/.

**Communications Research Center**
(College of Communication and Information)

The Communications Research Center, 420 Communications Building, is an adjunct to the communications graduate program. Objectives of the Center are: (1) to conduct original research in 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 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 interdisciplinary research directed at solving 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 Environmental, 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 Technology Research and Development Program. Grants and contracts bring approximately $4 million in research to the university each year.

**Institute of Agriculture**
Jack H. Britt, Vice President

The Institute of Agriculture dates to 1869 when the University was designated as Tennessee’s Federal Land-Grant Institution. Since the enabling federal legislation, agriculture education programs expanded to include mission-oriented basic and applied research in agricultural sciences and natural resources, and extending this knowledge to the citizens of the state. The Institute of Agriculture is composed of four units: the Tennessee Agricultural Experiment Station, the Agricultural Extension Service, the College of Agricultural Sciences and Natural Resources, and the College of Veterinary Medicine.
Agricultural Experiment Station
Jack H. Britt, Acting Dean
The University’s Board of Trustees established the Agricultural Experiment Station on July 18, 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 creation, the Station’s priority has been to improve agricultural production, provide leadership in marketing in Tennessee. Over time, programs have expanded to include natural resources and environmental stewardship.

The mission-oriented research initiatives of the Tennessee Agricultural Experiment Station, which are also reflected in thematic areas of the academic programs, are:

- **Molecular agriculture**—applying the tools of biotechnology to agricultural and natural resources problems.
- **Agro-environmental systems**—systems approach to production and natural resources problems.
- **Innovative technologies**—engineering and processing technologies in agriculture and food systems.
- **Agribusiness policies and practices**—developing policies and practices that have economic, environmental and societal benefits.

The seven academic departments located in Knoxville are part of the Tennessee Agricultural Experiment Station. The faculty members, with joint appointment in the Experiment Station and College of Agricultural Sciences and Natural Resources, are the graduate faculty participating in the eleven Master of Science and five doctoral programs. Research is conducted on campus and at the branch experiment stations located across Tennessee and operated by the Experiment Station. The Experiment Station also supports graduate student assistantships.

Agricultural Experiment Service
Charles L. Norman, Dean
The Agricultural Experiment Service was established in 1914. Its purpose is to extend through various educational means agricultural, natural resources, and family and consumer science information to the citizens in the state.

The 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 youth education through 4-H Clubs. County Extension staff members working directly with local people are supported in various information fields by specialist staff members, who are stationed either in Knoxville, Nashville, or Jackson. The University of Tennessee works cooperatively with faculty and staff at Tennessee State University in administering programs.

Faculty members, who are State Specialists, and area agents collaborate with other faculty members of the Institute of Agriculture to conduct ongoing and timely, issue-based applied research to meet the needs of agricultural producers, foresters, and others involved with the food and fiber system. Many of the Extension faculty members are involved with the departmental graduate programs.

The Agricultural Extension Service operates as one of the four units in the Institute of Agriculture. 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 in a three-way partnership among county, state and federal governments. The University of Tennessee represents the state and federal government and a County Agricultural Extension Committee represents county government in this partnership.

Libraries, The University of Tennessee
Barbara I. Dewey, Dean
Aubrey H. Mitchell, Associate Dean

Professors:
- Baker, Gayle D., M.L.S. ................. Alabama
- Bayne, Pauline S., M.S.L.S. .......... North Carolina
- Britten, William A., M.S.L.S. .......... Clarion
- Crowther, Karmen N.T., M.Ln. ........... Emory
- Dewey, Barbara I., M.A.L.S. ......... Minnesota
- Felder-Hoehne, Felicia H., M.S.L.S. .... Atlanta
- Leach, Sandra S., M.Ln. ............... Emory
- Lloyd, James B., Ph.D. ................. Mississippi
- Miller, Tamara J., M.S.L.S. .......... Kentucky
- Phillips, Linda L., M.L.S. ............... Rutgers

Associate Professors:
- Bridges, Anne E., M.L.S. .......... Rhode Island
- Deeken, Jo Anne, M.L.S. ............. North Texas State
- Dixon, Lana, M.S.L.S. ................. Tennessee
- Garrett, Marie A., M.L.S. ............. Vanderbilt
- Harris, Steven, M.L.S. ............... Arizona
- Johnson, Keya G., M.L.S. ............. Pittsburgh
- Kass, Margaret, M.L.S. ............... Indiana
- Keally, Jillian M., M.S.L.S. .......... Tennessee
- Mack, Thura, M.S.L.S. ................. Tennessee
- Prescott, Janette, M.S.L.S. ............ Western Michigan
- Row, Jane S., M.L.S. ................. Tennessee
- Royse, Molly, M.S.L.S. ............... North Carolina
- Smith, Rita H., M.S.L.S. .............. Illinois
- Thomas, Deborah L., M.L.S. .......... George Peabody
- Thomas, Steve, M.S.L.S. .............. Tennessee
- Viera, Anne R., M.L.I.S. .............. California, Berkeley
- Wallace, Alan, M.Ln. ................... Washington
- Williams, Sara, M.S.L.I.S. .......... Simmons
- Wise, Norman K., M.L.S. .............. Tennessee

Assistant Professors:
- Atkins, David P., M.A.L.I.S. ............ Wisconsin
- Beals, Jennifer, M.L.S. .............. Kent State
- Behrend, Linda, M.S.L.S. .............. Tennessee
- Berry, Teresa, M.S.L.S. .............. Tennessee
- Casado, Margaret, M.S.L.S. .......... Tennessee
- Davis, Troy, M.L.I.S. ................. North Carolina
- Dolence, Travis, M.S.L.S. .......... Illinois, Urbana-Champaign
- Gilmour, Ron, M.S.L.S. .............. North Carolina
- Hutt, Arwen, M.L.S. ................. Indiana
- Manoff, Maribeth, M.L.I.S. .......... South Carolina
- Pemberton, Anne, M.S. .............. Tennessee
- Purcell, Aaron, M.L.S. ............... Maryland
- Ratledge, David, M.S.L.S. .......... Tennessee
- Read, Eleanor, M.S. ................. Tennessee
- Smith, Anthony D., M.S. ............. Tennessee
- Starnes, Mary Ellen, M.L.I.S. ......... Kentucky
- Williamson, Jeanine, Ph.D. .......... North Carolina

The University of Tennessee Libraries own approximately 2.2 million volumes and subscribe to more than 14,000 periodicals and serial titles. A growing collection of electronic resources is available through the Libraries’ web page at www.lib.utk.edu. The Libraries’ membership in the Association of Research Libraries reflects the University’s emphasis on graduate education and support of large collections of library materials to meet the needs of a comprehensive university curriculum.

Experts at the reference desk in each library offer help and assistance in using the library for research. AskU.S. Now (www.lib.utk.edu/ref/askusnow/) provides chat, e-mail, and telephone connections to librarians. Students will find a wide variety of materials and services in the main library (John C. Hodges Library), four branches on the Knoxville campus (Agriculture and Veterinary Medicine Library, Map Library, Music Library, and Special Collections), and the Social Work Library in Nashville.

Students can search the library catalog and hundreds of databases at any library location and through the UT Libraries’ website. Interlibrary Services is available to help students find and retrieve materials that are not available in the UT Libraries. The services and facilities of the University Libraries are accessible to persons with disabilities.

The John C. Hodges Main Library (1015 Volunteer Blvd.) is a 350,000 square-foot building housing collections in all subject areas. The Hodges Library can accommodate more than 3,500 people space for group and individual study. The second floor CyberCafe is open for late night study, with networked computers, reading tables, and a coffee shop. Students may check out laptop computers equipped for connection to the Library’s wireless network. The Studio (located in the second floor Media Center) offers students a hands-on lab for creating and manipulating digital media. Workshops, classes and individual consultations are available throughout the semester to help students learn how to get the most out of the libraries’ services.

The Agriculture and Veterinary Medicine Library (Room A-113, Veterinary Teaching Hospital) has a strong collection in agriculture; veterinary; crop and human medicine; environmental studies and biodiversity; and related biological sciences. The Map Library (Room 15, basement of the Hoskins Library, Cumberland Ave. and 1st St.) houses a large collection of street maps, atlases, journals, and books related to cartography. Materials in print, film, and digital formats are gathered 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. Most 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 rare books, manuscripts, and historical ephemera. Students are welcome to use Special Collections. Materials from Special Collections cannot be checked out, but they can be used in the Special Collections Reading Room. The University Archives are also housed in the Hoskins Library. The Archives contain official records of the University.

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 separately administered. The students and faculty of the University can use all of the libraries affiliated with The University of Tennessee.

*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 through individual faculty research projects 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.

Research in process control concentrates in the areas of process modeling, control system design, and real-time expert systems. Measurement research includes development of rheological, optical, and other sensors, and mass spectrometry, as tools for monitoring and control of chemical processes.

### Nutrition Institute
**(College of Education, Health, and Human Sciences)**

**Michael B. Zemel, Director**

The Nutrition Institute is a system wide, multidisciplinary consortium of faculty who are engaged in research, teaching and other forms of human nutrition. The expertise and resources are multifaceted including tools and techniques used in cell biology, epidemiology, metabolism and clinical training.

The multidisciplinary nature of nutrition has created a situation where nutrition research and teaching is dispersed among a number of academic units, including the Department of Nutrition in the College of Education, Health, and Human Sciences as well as in several departments in the colleges of Agricultural Sciences and Natural Resources, Arts and Sciences, Medicine, and Veterinary Medicine. The Institute fosters collaboration among all efforts in nutrition sciences, coordinates collaborative research programs in nutrition and provides a unified forum for exchange interactions of 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 and research are pooled to strengthen nutrition-related instruction in these units.

### Off-Campus Graduate Centers
#### 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 telecommunication 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, course work, 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 http://antivirus.utk.edu 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, dial-up, or wireless connections. All students can take advantage of UT’s new wireless infrastructure, which is now available in most of the academic and administrative buildings on the Knoxville campus.

To provide access to computing facilities on campus, OIT maintains seven staffed computing labs, several un-staffed labs, and supports computing installations in residence halls. The computing labs are equipped with more than 600 microcomputers including current models of Apple, Dell, and Gateway.
Research Centers of Excellence

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

William Pulsinelli, 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.

FOOD SAFETY CENTER OF EXCELLENCE

Ann Draughon and 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.

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. To contact the HelpDesk, please dial 974-9900 or e-mail helpdesk@utk.edu. For more information, please visit our HelpDesk web site at http://oit.utk.edu/helpdesk.

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. These services include installing academic software free of charge on personally owned computers and helping students diagnose problems with their computers. We will also help clean up virus infected machines and reload/upgrade operating systems. 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, 9a.m. until 4p.m.

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 Microsoft 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

Our mission is to help UT students, faculty, and staff enhance the quality of their research by working together to effectively apply analytical methods, especially statistics. Other areas we support include computing, data file conversion, data mining, graphics, mathematics, scan form test scoring, text analysis, thematic mapping, visualization and web survey design. The costs for most of our services are centrally funded for the first ten hours of assistance each semester. Beyond that you or your department would be billed. Assistance is available by appointment via the helpdesk at 974-9900, by walk-in at 200 SMC and by email at StatHelp@utk.edu. For details, see http://oit.utk.edu/scar/.

THE INNOVATIVE TECHNOLOGY CENTER (ITC)

The ITC (http://itc.utk.edu) provides the leadership, support, resources, and training necessary to help the University of Tennessee and its faculty, graduate teaching assistants and academic teaching staff make effective use of technology in their teaching, both online and in the classroom. The ITC offers a wide selection of workshops, supports a resource-rich faculty development lab, awards grants for instructional technology projects, and maintains Online@UT, the university’s Blackboard-powered integrated online academic community.

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.
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 The University of Tennessee have benefited from its membership in Associated Universities (ORAU). ORAU is a consortium of 88 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 throughout the country; 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 manages, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, geological sciences, physics, 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 under-represented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at http://www.orau.gov/orise/educ.htm, or by calling either of the contacts below.

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, consortium research funding initiatives, faculty research, and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact Dr. Lee Magid, ORNL/ SMS Liaison and Acting Director, Joint Institute for Neutron Sciences and ORAU Councilor for The University of Tennessee, at (865) 974-1407; or Monnie E. Champion, ORAU Corporate Secretary at (865) 576-3306; or visit the ORAU home page: http://www.orau.gov.

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 awards 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).

3. URA, Inc. is a nonprofit corporation consisting of 86 major research-oriented universities in the United States, Canada, and Japan and is a management operating contractor for the U.S. Department of Energy (DOE) for the design, construction, and operation of the Fermi National Accelerator Laboratory (Fermilab) located near Batavia, Illinois. URA provides funds to support courses for graduate students at Fermilab. Member institutions have graduate study programs in science and are active in particle physics and astrophysics.

For more information about ORAU and its programs, SURA, and URA, Inc., contact Dr. Lee Magid, Office of Research and Information Technology and ORAU Council member at 865-974-1407; or contact Monnie E. Champion, ORAU Corporate Secretary at 865-576-3306. Additional information may also be found on World Wide Web sites at http://www.orau.gov and http://cebaf.gov/ura.

Textiles and Nonwovens Development Center

(College of Engineering)

Raymond Buchanan, Director
David P. Garner, Interim Director of Operations and Resources
Larry C. Wadsworth, Senior Executive for Marketing and Technology

The Textiles and Nonwovens Development Center (TANDEC) was officially dedicated in October 1990. TANDEC was made possible through a grant from ExxonMobil Chemical Company.

Nonwovens products loom large in a number of markets and TANDEC has a strong reputation in both basic research and nonwoven product development. Nonwovens research programs at UT include structure-property-process relationships in melt blowing polyolefins, polyesters, nylon, elastomeric polymers, engineering thermoplastics and recycled plastics; mechanism of melt blown web formation; modeling of melt blowing and spunbonding processes; development of on-line optical measurements for control of the critical properties of melt blown webs; electrical measurement of fiber alignment and bonding in nonwoven webs; thermal bonding and characterization of cotton/synthetic fiber nonwovens; computational analysis of heat transfer behavior in thermal calendaring; study of protective apparel for agricultural, industrial and medical uses; and finishing of nonwovens. In addition to the basic research, technology transfer has been accomplished...
during the past several years by assisting companies in applied projects, primarily in the melt blowing area. Collaboration is ongoing with faculty in the 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 industrial companies. The nonwovens laboratory hosts numerous guests from industry and other institutions, and the facilities are planned to meet their needs, while safeguarding research confidentiality.

**Tourism Institute**
(College of Education, Health, and Human Sciences)

John Salazar, 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 tourist base. It works with agencies and businesses to develop strategies for creating and expanding tourism enterprises. It also provides management level personnel to the tourism industry through the degree programs in the department and assists the industry in workforce training.

**University of Tennessee Space Institute**

John E. Caruthers, Associate Vice President and Chief Operating Officer

The Space Institute is a graduate education and research institution located on a 365-acre lakeside 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 desiring 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, 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 an established Center of Excellence in Laser Applications and offers graduate studies and research opportunities in laser diagnostics, laser materials interactions, pico-second processes, and coherent and non-linear optics.

The Institute was established in part to increase the research and 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 for Academic Affairs, The University of Tennessee Space Institute, Tullahoma, Tennessee 37388.

**University Outreach and Continuing Education**

Robert Leiter, Dean
Norvel L. Burkett, Associate Dean and Director of Conferences
Gayle Cooper, Assistant Dean for Professional and Personal Development
George H. Hoemann, Assistant Dean for Distance Education and Independent Study

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 program resources through outreach initiatives. University Outreach and Continuing Education works with 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 change. The Division provides these opportunities through program coordination and development of the four departments: Department of Conferences, Department of Distance Education and Independent Study, English Language Institute, and Professional and Personal Development.

For more information, contact: University Outreach and Continuing Education, 1534 White Avenue, Knoxville, Tennessee 37996-1526, Phone: (865) 974-3181, FAX: (865) 974-6629, E-mail: outreach@tennessee.edu, Web Site: www.outreach.tennessee.edu.

**DEPARTMENT OF CONFERENCES AND UNIVERSITY CONFERENCE CENTER**

Norvel Burkett, Associate Dean and Director
Robert Gibbs, Assistant Director

The Department of Conferences, housed in the Conference Center Building in downtown Knoxville, provides management services to university departments and faculty or outside groups that desire to hold an educational meeting anywhere in Tennessee or across the United States.

The department assists organizations in designing and managing programs to meet the needs of attendees. The staff provides professional guidance and management for small group meetings as well as for major conventions of several thousand delegates. Consulting and support services can include planning and budgeting, registration, lodging, food services, promotional materials, meeting-site management and all details to ensure a successful event. Some programs qualify for Continuing Education Units (CEUs), which become a permanent record maintained by the University Outreach and Continuing Education.

The University Conference Center, managed by the Department of Conferences, offers quality meeting facilities and service to university units, business and industry groups, professional and special interest organizations, and government agencies. Professional groups and interested individuals can request interactive videoconferencing to locations worldwide. Arrangements can also be made to receive (downlink) programming or transmit (uplink) programming via satellite.

Additional Information may be obtained from: University of Tennessee Conferences, P.O. Box 2648, Knoxville, Tennessee 37901, Phone: (865) 974-0250, FAX: (865) 974-0264, E-mail: conferences@tennessee.edu, Web Site: www.outreach.tennessee.edu/conferences.
ENGLISH LANGUAGE INSTITUTE
Jim Hamrick, Director

The English Language Institute (ELI) offers a non-credit language-study program. It is designed to assist students in their pursuit of career goals or educational objectives in the United States. The courses emphasize development of communicative ability in listening, speaking, reading, and writing. Faculty members are trained in teaching English to speakers of other languages and different national backgrounds, with varying proficiency in English.

The curriculum consists of eight proficiency levels: 101-108, Introductory through Pre-Academic.

Classes meet 3-5 periods each day with emphasis on English Structure (Grammar); Listening Comprehension, Writing/Composing (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 Mountcastle Street, Knoxville, Tennessee 37996-3505, Phone: (865) 974-3404, FAX: (865) 974-6383, E-mail: eli@tennessee.edu, Web Site: www.outreach.tennessee.edu/ELI.

PROFESSIONAL AND PERSONAL DEVELOPMENT
Gayle Cooper, Assistant Dean and Director
Nissa Dahlin-Brown, Assistant Director

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 also are 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 focusing on issues and courses for senior adults; and the Smoky Mountain Field School, a program co-sponsored with Great Smoky Mountains National Park.

For further information or to register, contact: Professional and Personal Development, 1534 White Avenue, Knoxville, Tennessee 37996-1526, Phone: (865) 974-0150, FAX: (865) 974-0154, E-mail: ProfessionalPgms@tennessee.edu, Web Site: www.outreach.tennessee.edu/ppd.

DEPARTMENT OF DISTANCE EDUCATION AND INDEPENDENT STUDY
George H. Hoemann, Assistant Dean

The Department of Distance Education and Independent Study, in concert with academic departments, offers Internet-based, Web-delivered classes, and programs leading to certificates and degrees. The College of Communication and Information 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 available as well as a variety of individual courses in many disciplines. 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 wanting 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, Tennessee 37996-1525, Phone: (865) 974-1534 or (800) 670-8657, FAX: (865) 974-4884, E-mail: DistEducation@tennessee.edu, Web Site: anywhere.tennessee.edu.

Tennessee Water Resources Research Center
(Office of Research)
Timothy R. Gangaware, Associate Director

The Tennessee Water Resources Research Center, 600 Henley Street, Suite B060, 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.

http://eerc.utk.edu/divisions/wrrc
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